

**INOX GREEN ENERGY SERVICES LIMITED
&
RESCO GLOBAL WIND SERVICES PRIVATE LIMITED**

HEALTH SAFETY AND ENVIRONMET MANUAL



**CORPORATE HUMAN RESOURCES
(HEALTH SAFETY & ENVIRONMENT)**

**5th Edition
1st April, 2022**

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I. BACKGROUND:

For a systematic self sustaining Health, Safety and Environment Management System, **INOX GREEN ENERGY SERVICES LIMITED (IGESL) & RESCO GLOBAL WIND SERVICES PRIVATE LIMITED (RESCO)** adopts a comprehensive Health, Safety and Environment Management Framework, which shall serve as the strategic level guidance for the Company for planning for safety and health in the operational environment.

I. SCOPE:

These guidelines are applicable at all sites of Operation & Maintenance (O&M) & Projects (Infrastructure) at IGESL & RESCO.

II. BUSINESS CASE FOR SAFETY AND HEALTH

By investing in workplace safety and health IGESL & RESCO expects to reduce fatalities, injuries, and illnesses. This shall, in return, will result in cost savings in a variety of areas, such as lowering workers' compensation costs and medical expenses, avoiding legal penalties, and reducing costs to train replacement employees and conduct accident investigations. A reputation of a poor safety record may result in lower customer trust. A poor safety record is a reflection of how well a business is managed, and that may result in customers questioning how well other fundamentals of the business are managed such as quality, reliability, and ability to plan, schedule, and meet deadlines. The Company also believes that improvement in workplace's safety and health result in significant improvements in the employees' morale and engagement, organization's productivity, financial performance and Company's reputation as a good corporate citizen and an 'employer of choice'.

III. PURPOSE OF IGESL HEALTH, SAFETY AND ENVIRONMENT MANAGEMENT FRAMEWORK

- i) This framework shall ensure planning, implementation, measurement, review and improvement in the safety of our employees and at workplace.
- ii) This framework shall ensure that safety and health issues are not seen as stand-alone. They need to be integrated into existing safety and health management systems and support overall safety and health policy of the organisation.

IV. PRINCIPLES

All Health, Safety and Environment Management practice, process and policy in the Company shall be based on the HSE Principles as stated below

- a) All Accidents and Incidences are preventable
- b) Everybody is responsible for safety of himself and around him
- c) Safety is an overriding priority and a Company Value

V. BROAD OUTLINE OF IGESL & RESCO HEALTH, SAFETY AND ENVIRONMENT MANAGEMENT FRAMEWORK

- i) The Framework shall ensure an integrated approach towards safety, health and environment management across all IGESL/RESCO sites and shall have following 25 Safety, Health and Environment elements, which has been put into a guideline for implementation –
- ii) The above elements shall be implemented in an integrated manner following the PDCA cycle model to ensure a sustainable Safety and Health Culture in the Company with Leadership Commitment at the centre.

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- iii) Each element shall have an exclusive policy document and implementation procedure which shall be applicable across all IGESL & RESCO Sites to ensure standardisation of processes and systems. Such documents collectively shall comprise the IGESL / RESCO Safety and Health Management Manual.
- iv) The Framework shall be reviewed annually to make it more effective as the Safety and Health culture matures over a period of time.

VI. DEFINITIONS:

1. **IGESL** Mean by: **INOX GREEN** ENERGY SERVICES LIMITED.

2. **RESCO** Mean by: RESCO GLOBAL WIND SERVICES PRIVATE LIMITED.

3. INCIDENT

Work- related or natural event(s) in which an injury, or ill health (regardless of severity), damage to property or Fatality occurred or could have occurred.

4. NEAR MISS(NM)

An incident where no ill health, injury, damage or other loss occurs, but it had a potential to cause, is referred to as "Near – Miss".

5. MAN HOUR WORKED

The total number of man hours worked by all employees including subcontractors working in the premises. It includes managerial, supervisory, professional, technical, clerical and other workers including contract labours. Man-hours worked shall be calculated from the payroll or time clock recorded including overtime. When this is not feasible, the same shall be estimated by multiplying the total man-days worked for the period covered by the number of hours worked per day. The total number of workdays for a period is the sum of the number of men at work on each day of period. If the daily hours vary from department to department separate estimate shall be made for each department and the result added together.

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6. FIRST AID CASES

First aids are not essentially all reportable cases, where the injured person is given medical treatment and discharged immediately for reporting on duty, without counting any lost time.

7. MEDICAL CASES

Medical cases come under non-reportable cases, where owing to illness or other reason the employee was absent from work and seeks Medical treatment.

8. LOST TIME INJURY

Any work injury which renders the injured person unable to perform his regular job or an alternative restricted work assignment on the next scheduled work day after the day on which the injury occurred.

9. NON – REPORTABLE CASES

An incident, where the injured person is given medical help and discharged for work without counting any lost time.

10. REPORTABLE CASES

In this case the injured person is disable for 48 hours or more and is not able to perform his duty.

11. INJURY CASES

These are covered under the heading of non-reportable cases. In these cases the incident caused injury to the person, but he still continues his duty

12. TOTAL REPORTABLE FREQUENCY RATE

Frequency rate is the number of Reportable Lost Time Injury (LTI) per one Million Man hours worked.

Mathematically, the formula read as:

$$\frac{\text{Number of Reportable LTI} \times 1,000,000}{\text{Total Man Hours Worked}}$$

13. SEVERITY RATE

Severity rate is the Number of days lost due to Lost Time Injury (LTI) per one Million Man hours worked.

Mathematically, the formula reads as:

$$\frac{\text{Days lost due to LTI} \times 1,000,000}{\text{Total Man Hours Worked}}$$

14. INCIDENCE RATE

Incidence Rate is the Number of LTI per one thousand manpower deployed. Mathematically, the formula Reads as:

$$\frac{\text{Number of LTI} \times 1000}{\text{Average number of manpower deployed.}}$$

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SAFETY HEALTH & ENVIRONMENT POLICY

In **INOX GREEN ENERGY SERVICES LIMITED (IGESL)**, we all are committed to achieving the vision of "Zero Injury" – people, assets & "Zero environmental Incidents"

- Perpetual improvements in SHE performance through leadership, Training, Participation & Consultation.
- Ensure compliance with all applicable laws, regulations, and standards.
- Analyze the risk opportunities and set objectives to address them in the short- and long-term.
- We strive to contribute to the society in which we operate.
- Work with employees, contractors to teach, Motivate & lead them to do their job in a safe & responsible manner.
- Assuring employees' well-being through "Health Management Programs".
- Incorporating SHE into business planning and decision making fosters a culture of commitment among all INOX employees.
- Providing continuous improvement in the ecological management system by implementing the changes to enhance the environment performance & protect it from all kinds of environmental risks.
- We ensure the "Environmental Impact & Aspect" of our operation are addressed effectively & we follow the law

In this way we aim to achieve a SHE performance we can be proud of to earn the confidence of customer Share holder and society at large and contribute to the sustainable development.

Date: 1st April 2022

Rev: 01

Authorized By:



Kailash Tarachandani
(Chief Executive Officer)

SAFETY HEALTH & ENVIRONMENT POLICY

In RESCO GLOBAL WIND SERVICES PRIVATE LIMITED (RGWSPL), we all are committed to achieving the vision of “Zero Injury”– people, assets & “Zero environmental incidents”

- Perpetual improvements in SHE performance through leadership, Training, Participation & Consultation.
- Ensure compliance with all applicable laws, regulations, and standards.
- Analyze the risk opportunities and set objectives to address them in the short- and long-term.
- We strive to contribute to the society in which we operate.
- Work with employees, contractors to teach, Motivate & lead them to do their job in a safe & responsible manner.
- Assuring employees' well-being through "Health Management Programs".
- Incorporating SHE into business planning and decision making fosters a culture of commitment among all RGWSPL employees.
- Providing continuous improvement in the ecological management system by implementing the changes to enhance the environment performance & protect it from all kinds of environmental risks.
- We ensure the “Environmental Impact & Aspect” of our operation are addressed effectively & we follow the law

In this way we aim to achieve a SHE performance we can be proud of to earn the confidence of customer Share holder and society at large and contribute to the sustainable development.

Date: 1st April 2022

Rev: 01

Authorized By:



Mallash Tarachandani
(Chief Executive Officer)



CERTIFICATE



**Management system as per
EN ISO 14001:2015, ISO 45001:2018**

In accordance with TÜV AUSTRIA CERT procedures, it is hereby certified that



INOX GREEN ENERGY SERVICES LIMITED

**Head Office (HO): Plot No.17, Sec-16 A, Noida - 201301,
Uttar Pradesh, India**

applies a management system in line with the above standard for the
following scope

**Operation & Maintenance of Wind Turbine, 33 Kv Line & Gss
(Pooling Substation) Across All Sites**

Certificate Registration No. 20104193005010
20116213011046

Valid until 2025-03-26
Initial certification: 2019-03-27

Certification Body
at TÜV AUSTRIA CERT GMBH

Vienna, 2022-04-13

This certification was conducted in accordance with TÜV AUSTRIA CERT auditing and certification
procedures and is subject to regular surveillance audits.
TÜV AUSTRIA CERT GMBH Deutschstraße 10 A-1230 Wien www.tuv.at



Online Verification



www.tuv.at/certcheck

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1. BACKGROUND:

The site HSE Management Organization structure describes the company's commitment to HSE management. This manual specifically gives the outline of roles, responsibilities and accountability of site personnel for ensuring safe & healthy work environment at site.

2. SITE SAFETY COMMITTEE:

Site Safety Committee plays very important role in the field of implementation of safety culture at site. It provides the platform for the functioning worker and management jointly. Safety committee would meet periodically to review the safety cultures developed amongst the employees as per company's HSE programme and also to identify any hindrances which are coming across during developing such culture.

Site safety committee consisting of equal numbers of representatives of workers and management to promote co operation between workers and management in maintaining proper safety and occupational health at work and to review periodically measures taken in that behalf.

Further, site safety committee shall be reviewed minimum once in a year or whenever applicable.

The Safety committee shall meet as often as necessary but at least once in every month. The minutes of the meeting shall be recorded; Signature of all safety committee members shall be taken on attendance sheet and circulated among the committee members.

The major function of the Safety Committee shall be:

- a. Assisting and co operation with management in achieving the aims and objectives outlined in the Health Safety & Environment Policy.
- b. Dealing with all matters concerned to Occupational Health and Safety and to arrive at Practicable solutions of the problems.
- c. Involving other employees/departments in various projects and functions to reaffirm everyone's Responsibility for health and safety.
- d. Creating Safety awareness among all employees.
- e. Undertaking educational training and promotional activities like safety competitions, safety day celebrations, world environment day celebration injury prevention campaigns etc...
- f. Discussing reports on safety, environment and occupational health surveys, safety audits, risk assessment, emergency and disaster management plans and implementation of the recommendations made in the reports.
- g. Carrying out health and safety surveys and identifying causes of accidents.
- h. Identifying high risk job tasks and developing written safe operating procedures.
- i. Looking into any complaint made on the likelihood of an imminent danger to the Safety and health of the workers and suggesting corrective measures.
- j. Reviewing implementation of the recommendations made by it.

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3. SITE SAFETY COMMITTEE – CHAIRMAN:

The Site in charge of Infrastructure / O&M shall be the SITE HSE Chairman. The committee shall meet once in a month & issue MOM. Copy of MOM shall be marked to Corporate Office.

The Ultimate responsibility for the safety, health and environmental performance at site shall meet sites requirement. His role shall be as under:

- a. Chair all Safety Committee, Audit Opening and closing meetings.
- b. Review on a regular basis the HSE performance of the site
- c. Hold people accountable for compliance of HSE guidelines in respective work area
- d. Review Safety Guidelines and propose changes
- e. Have HSE round and surprise inspections of site and operations. Conduct safety communication meetings with company and Contractors employees at periodic intervals.
- f. Ensure that HSE targets are part of the individual KRA.
- g. Chairman shall nominate one person (employee) as a co chairman who will chair the safety committee meeting during absence (in any emergency conditions) of existing chairman.

4. SITE SAFETY COMMITTEE – SECRETARY:

The Head of HSE at site shall be the Site Safety Committee Secretary and shall drive the day to day HSE Activities at site. His role shall be as under.

Serve as a communication liaison between management and the committee.

- a. To record and disseminate minutes of each meeting, problems and issues and corrective action proposed and actions taken to address each issue.
- b. Actively promote health and safety by this communication with employees and supervisors.
- c. To present accident /incident statistics to the Safety Committee.
- d. To present data of HSE training conducted /planned to the Safety Committee.
- e. To present HSE activities conducted /planned.
- f. Conduct HSE portion of contractor pre-qualifications.
- g. Interact with agencies and community regarding HSE issues.
- h. Secretary shall nominate on person (employee) as a co secretary who will coordinate the meeting during absence (in emergency conditions) of existing secretary.
- i. Re construction of safety committee shall be at least once in six month.

5. FUNCTIONS AND DUTIES OF SAFETY COMMITTEE MEMBERS:

The functions and duties of Safety committee shall include-

- a. Assisting and co operating with management in achieving the aims and objectives outlined in the Health Safety & Environment Policy.
- b. Dealing with all matters concerned to Occupational Health and Safety and to arrive at Practicable solutions of the problems.
- c. Involving other employees/departments in various projects and functions to reaffirm everyone's responsibility for health and safety.
- d. Creating Safety awareness among all employees.
- e. Undertaking educational training and promotional activities like safety competitions, safety day

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celebrations, world environment day celebration injury prevention campaigns etc.

- f. Discussing reports on safety, environment and occupational health surveys, safety audits, risk assessment, emergency and disaster management plans and implementation of the recommendations made in the reports.
- g. Carrying out health and safety surveys and identifying causes of incidents.
- h. Identifying high risk job tasks and developing written safe operating procedures.
- i. Looking into any complaint made on the likelihood of an imminent danger to the Safety and health of the workers and suggesting corrective measures.
- j. Reviewing implementation of the recommendations made by it.

6. AGENDA OF SAFETY COMMITTEE MEETING:

- a. Agenda of meeting shall be circulated by coordinator/secretary prior to meeting scheduled.
- b. Review status of legal compliance and action plan.
- c. Review and confirmation of unfinished items from the previous meeting(s) and/or activities.
- d. Reports the action taken to correct observed hazards.
- e. Discussion of how to improve the issues from the last months.
- f. Ensure that the work is being performed safely and smoothly, complying with safety rules, regulations and method statements.
- g. Review of accident/incidents sustained since the previous meeting and a discussion of measures to prevent similar accidents and incidents.
- h. Review of the status of current action plans.
- i. Review of outstanding recommendations developed by outside loss control consultants, auditors.
- j. Review the concern raised by the members during meeting.
- k. Review activities related to future action plans and /or training programs.
- l. Review future agenda items, projects and meeting dates.

7. RIGHT OF SAFETY COMMITTEE:

Safety committee shall have the right to be adequately and suitably informed of-

- a. Potential safety, health & Environment hazards to which the workers may be exposed at work place.
- b. If any repeated safety violation found by contractors then safety committee has right to issue warning note /penalty note or can implement consequence management policy through Corporate HR.
- c. Data on accidents as well as data resulting from surveillance of the working environment and of the health of workers exposed to hazardous substances so far as the site location is concerned, provided that the committee under takes to use the data on a confidential basis and solely to provide guidance and advice on measures to improve the working environment and safety of the workers.

8. ASSIGNMENT OF HSE RESPONSIBILITIES:

- | | |
|--------------------|--|
| I. POSITION | : PROJECT / O&M IN CHARGE |
| REPORTS TO | : STATE HEAD/ CORPORATE |
| SUPERVISE | :DEPUTY MANAGER /MANAGER/AND DEPARTMENT LEADS |

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RESPONSIBILITIES AND ACCOUNTABILITY:

The Infrastructure / O&M in charge is responsible and accountable for project/site safety and for working with various departments, employer's representative, and assigned staff to ensure that from project inspection to project / site adequate resources and top management support are provided to ensure a safe work site in accordance with project / site safety plan. This includes proper staffing, financial support, safe design and management support for necessary actions taken.

The responsibilities and duties shall include the following:

- a. Delegate specific responsibilities and duties to all field management staff and ensure such functions are carried out.
- b. Establish a realistic Safety Policy for the site.
- c. Make clear and stress at every opportunity that safety and Health are a line responsibility. Lead by example.
- d. Direct field management in carrying out their duties and responsibilities.
- e. Preside over Safety Committee Meeting and delegate this responsibility to Deputy Manager, Safety Officer when unable to attend.
- f. Make final decision on matters affecting field construction work, after consultation with various groups within the field organisation.
- g. Advise and / or instruct subordinate regarding any actions necessary to correct any hazardous activities or work conditions.
- h. Review and finalize IGESL/RESCO Safety Management System and Safe Work practices and other Safety Documents.
- i. Authorize Safety Incentive Scheme.
- j. Patrol the site as frequently as possible (shall twice in month) to ascertain the work and safety status on site using Annexure 2.3 in conjunction with site HSE Manager.
- k. Establish and direct an Accident Investigation Team when an accident occurs.
- l. Suspend work or prohibit the use of facilities, if emergency measures are required, to correct the hazardous activities or work conditions, until their rectification is confirmed.
- m. Remove any person from the site who seriously or repeatedly fails to comply with the safety and security requirements and rules.
- n. Take the lead in promoting housekeeping at the highest standards.
- o. Review safety performance, safety topics, and safety activities, status with the Project In charge, HSE Manager and the Civil/Electrical/Mechanical Managers on a regular basis.
- p. Report on safety performance, safety activities, and any accident or near misses, to the employer's representative in a regular and timely manner.
- q. Review and assign the responsibilities and duties of each position.
- r. To monitor and measure, with the field Management Staff and Staff and Safety Department, the safety performance of each employee. Recognition shall be awarded to those who have performed consistently well. Corrective, measure / disciplinary actions shall be applied to those who fail to comply with their designated duties and responsibilities.

II. **POSITION** : CONSTRUCTION/CIVIL/MECH.MANAGER
REPORTS TO : PROJECT MANAGER
SUPERVISE : RESPECTIVE MANAGERS AND DEPARTMENT HEADS

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RESPONSIBILITIES AND ACCOUNTABILITY:

The Construction Manager is to assist the Project Manager to manage, supervise and control construction and safety activities when the erection, fabrication, installation & civil work during WTG towers installation and other works are going on.

The responsibilities and duties shall include the following:

- Assist Project Manager in construction, co-ordination, schedule / plan, budgeting and technical activities.
- Implement Project manager directive as required and acts in his absence or assume fieldwork responsibility when directed.
- To Preside over Safety Committee Meeting upon delegation from Project Manager.
- Advocate the setting up of the HSE Procedures, Rules and Regulations, HSE Training Plan, etc.
- Conduct any other safety meeting and follow up meeting where necessary.
- Remove any person from the site who seriously or repeatedly fails to comply with the safety and security requirements and rules
- Take the lead in promoting housekeeping at the highest standards.
- Review HSE performance, HSE topics, and safety activity status with the PM /HSE Manager on a regular basis.

III. POSITION	: HSE MANAGER / EXECUTIVE/OFFICER
REPORTS TO	: PROJECT / SITE MANAGER/STATE HEAD
SUPERVISE	: Senior & Junior Engineers, Supervisors & Contractors

RESPONSIBILITIES AND ACCOUNTABILITY:

To carry out his duty of ensuring the environment and safety & health of the person employed on site, then he shall:

- Advice **INOX GREEN** ENERGY SERVICES LTD. & RESCO management on the measures to be taken in the interest of environment and safety & health of persons employed therein.
- Develop HSE Management System, HSE Rules and Regulations and Safe Work Practice for the project and monitor its implementation and compliance. Make rules for the disciplinary action in case of any defaults by co. employees or sub contractor's personnel.
- Inspect the site personally or direct his Engineers /officers to Inspect the site on his behalf to determine whether there is any Machinery, Plants, Equipments, appliances or any type of manual labourer being used in the site which is of such nature that is liable to cause risk or badly injury to any person working or employed in the site.
- Investigate any fatal accident and / or dangerous Occurrence, which occurs within the site and any industrial disease, contracted in the site.
- Compile and maintain HSE statistics and present HSE Performance Report to the **INOX GREEN** ENERGY SERVICES LTD. & RESCO management.
- Organize training courses, competitions, contest and other activities, which will develop and maintain the interest of the persons employed on site so as to establish a safe and healthy working condition therein.
- Review the Method Statements and Risk Assessment and Suggest improvement or any safety requirement, which needs to be incorporated into the above. Ensure that the respective Engineer applies the approved method statements and safety control stipulated in the Risk Assessments during the execution of the work.
- Manage and control situation arising during an emergency. Continuously review the emergency

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procedure and update accordingly.

- i. Monitor the implementation of the Security Procedure.
- j. Act as Secretary to the Safety Committee established at site and assist the Chairman in directing the functions of the Site Safety Committee.
- k. In the absence of the Chairman, preside at all meeting of the Site Safety Committee.
- l. Monitor the records and compliance of the Maintenance Regime for Construction Equipment and machinery. Shall advice the supervisor on any equipment or machinery, which is due for inspection.
- m. Liaise with Statutory Bodies with regards to HSE matters.
- n. Provide support to the construction department for implementation of project HSE Plan.
- o. Provide leadership, planning and motivation in the implementation of Health, Safety & Environment and loss control.
- p. Develop and the review of procedures and systems designed to facilitate safe work.
- q. Developing, regularly reviewing and, as appropriate, revising the project HSE plan to ensure that it continues to meet the specific requirements of the project.
- r. In consultation with Project / Site Management, regularly review safe work procedures.
- s. Establishing a monitoring regime to ensure that unsafe systems, places or practices are identified and remedied at the earliest.
- t. Carryout a detailed investigation of major accidents / incidents including near miss on site and convey the findings to all to prevent the recurrence of such type of accidents / incidents in future.
- u. Manage and organize the general activities of site safety and give guidance to the Section Engineers. Prepare reports at monthly intervals or, as required by Project Management, regarding overall Project HSE Management.
- v. Initiate and impart HSE training programmes for contract workers / employees, company's project staff / O & M staff.
- w. Shall ensure that safety committee meeting is conducted on regular basis.
- x. Review the Tool Box Meeting activities carried out by Subcontractors. Dictate the frequency of Tool Box Meeting of each work group with the advice of the Engineers and Safety Personnel. Monitor and supervise daily pep talk/ tool box talks, explaining tasks to be performed and risks/ hazards involved in it.
- y. Analyze all works, identify any serious hazards and be proactive in implementing procedures that encourage safety construction.

- IV. **POSITION** : SITE ENGINEER
REPORTS TO : SECTION / SITE IN CHARGE
SUPERVISE : Jr. Engineers / Technicians / Supervisors & Contractors

RESPONSIBILITIES AND ACCOUNTABILITY:

The Site Engineer/Engineer shall take the initiative to ensure that the total construction work/O&M progresses smoothly and safely.

The responsibilities and duties shall include the following:

- a. Co-ordinate, plan the work, schedule, and lease with other necessary department to ensure that conflicts of interest between subcontractors do not occur and are performed in a safe and efficient manner.
- b. Direct Jr. Engineers, Technicians, and supervisors on their HSE duties and responsibilities.
- c. Attend the Progress Co-ordination Meeting and teakettle lead to address HSE issues in the meeting.
- d. Analyze all works, identify any serious hazards and be proactive in implementing procedures that encourage safe work.

Rev.	Date	Issued By	Guideline No.	Page No.
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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	HSE ROLE & RESPONSIBILITIES, PERFORMANCE REVIEW AND AUDIT	Guideline No IGESL SITE/HSE/002
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- e. Ensure that the works are carried out as per the approved Method Statement and Risk Assessment or other procedure which is implemented.
- f. Ensure that Method Statements/procedure, which incorporate adequate provisions for safety, have been provided for all critical work.
- g. Direct Jr. Engineers to check that the work at the site complies fully with the Procedure and the precautions given.
- h. Patrol the site daily and ascertain the work and HSE Status.
- i. Advise and / or instruct Site Engineer regarding necessary corrective actions for unsafe activities and hazardous or unhealthy working conditions.
- j. Review the Tool Box Meeting activities carried out by contractors. Dictate the frequency of Tool Box Meeting of each work group with the advice of the Engineers and Safety Personnel.
- k. Confirm that contractors / Subcontractors are fulfilling their responsibilities in regards to HSE requirements.
- l. When critical measures are required to correct unsafe Activities or work conditions, suspend work or prohibit the use of facilities until rectification is confirmed.
- m. Promote regular housekeeping at the highest standard.
- n. Ask advice from the Safety Personnel when any doubt exists about Safety Procedure at the site.
- o. Reports to seniors on any anticipated matters of concern.
- p. Participate in Safety Meetings as required.
- q. Provide assistance and support in any accident investigation.
- r. Identify and instruct / encourage subordinates to participate in HSE training, Courses and Seminars.
- s. Familiarize with the **INOX GREEN** ENERGY SERVICES LTD. HSE Policy, Alcohol & Drug Policy, HSE Plan, Emergency and Evacuation Procedures and any other relevant HSE Programme. Lead by example.

VI. EMPLOYEES:

All employees:

- a. Use the correct tools and equipment for the job and use safety equipment and protective clothing supplied, e.g. helmets, goggles, ear protection, etc. as instructed.
- b. Keep tools in good condition.
- c. Report to the Supervisor any unsafe or unhealthy condition or any defects in plant or equipment
- d. Develop a concern for safety for themselves and for others
- e. Keep the working area neat & tidy.
- f. Not to operate any item of plant unless they have been specifically trained and are authorized to do so

VII. CONTRACTORS:

Contractors / Subcontractors who intend to carry out work on the Project/operational Sites must comply with these requirements:

- g. Comply with all of the elements of the HSE Plan and any regulations applicable to the work
- h. Contractor should deploy at least one dedicated person for safety it may be steward/supervisors who will be responsible for all safety aspects.
- i. Contractor supervisor will be responsible for briefing to all workers and job safety.
- j. Comply with the Procedure and any document provided in the interests of Environment, Health and Safety.
- k. Ensure that all of their employees designated to work on site are properly trained and competent.

Rev.	Date	Issued By	Guideline No.	Page No.
05	01.04.2022	Head (Group Corporate Human Resources)	IGESL SITE/HSE/002	Page 15 of 345

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	HSE ROLE & RESPONSIBILITIES, PERFORMANCE REVIEW AND AUDIT	Guideline No IGESL SITE/HSE/002
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- l.** Ensure that all plant and equipment they bring on to site has been inspected and serviced in accordance with legal requirement and manufacturer's or suppliers' instructions.
- m.** Make arrangements to ensure that all employees designated to work on or visit the site present them for site induction prior to commencement of work.
- n.** Provide details of any hazardous substances to be brought onsite.
- o.** Submit all proposed HSE procedures and methods to MR for review.
- p.** Ensure that a responsible person accompanies any of their visitors to site.
- q.** Sign and accept the contractor's Safety Agreement.
- r.** Understand the Disciplinary procedures and make their personnel aware of the same.

9. SAFETY PERFORMANCE REPORTING:

- a.** It shall be the responsibilities of HSE Team representative to forward the monthly safety report and weekly safety reports, which will include safe man hours (IGESL & Contractors), tool box talk, Induction training for new joiners, HSE training conducted, near misses, first aid, lost time injury report etc. Monthly report shall reach to HO on or before 5th day of the every month and weekly report should reach every Monday.
- b.** Format as given in Annexure to this Guideline.
- c.** A Separate Report needs to be sent for each Site.
- d.** Such Report shall be sent to Corporate.
- e.** Reports shall be compiled and a Monthly HSE report shall be circulated to the Management by 10th of every month.

10. PERIODIC AUDIT –

All Sites shall undertake HSE Audit at periodic intervals. Such audit shall be as per the below schedule

- a.** Annual Site HSE audit – Such audit shall be organized by the Corporate HR function to reviews all the aspect of HSE Management and compliance to all HSE Guideline.
- b.** Half yearly cross audit –interstate internal safety audit by site safety personals.
- c.** Periodic Specific Audit – Such audit shall include the following and shall be conducted by external agencies
 - i.** Ambient air testing once in 6 months.
 - ii.** Noise Test once in 6 months
- d.** Visitor Feedback on Site.
 - i.** All visitors will be requested to provide his feedback and from corporate shall mandatorily fill inspection sheet as per the attached format (Annexure 2.4) when they visit sites. Such feedback shall be calculated then circulated at the site and also to Functional Head and Head – GCHR.

11. POWER TO AMEND:

- a.** Any change of the manual shall be approved by the Head - GCHR.
- b.** The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding

Rev.	Date	Issued By	Guideline No.	Page No.
05	01.04.2022	Head (Group Corporate Human Resources)	IGESL SITE/HSE/002	Page 16 of 345

Doc. No. IGESL/HSE/F-01/Rev.05 Annexure: 2.1 Date: 01.04.2022	INOX GREEN ENERGY SERVICES LTD. FORMATION OF SITE SAFETY COMMITTEE	
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CIRCULAR

Date: DD/MM/YYYY

The safety committee is constituted with immediate effect as below;

Sr. No.	Name	Designation	Role
1.		Site In charge	Chairman
2.		Safety in Charge	Secretary
3.		Nominated Person	Co Secretary
4.			Member
5.			Member
6.			Member
7.			Member
8.			Member
9.			Member
10.			Member
11.			Member
12.			Member
13.		Technician	Member
14.		Supervisor/Casuals- Contractor	Member
4.		Invitees	Member

Periodicity

The committee will meet at least once in a month.

Circulation

Secretary will circulate the schedule of meeting in advance.

Gist of meeting will be minuted in the standard format and circulated to the following under the signature of secretary---

In absence of Secretary, nominated person/co secretary will take this responsibility.

1. Chairman 2. Head O&M/Infra
3. Members 4. Other Concerned
5. Invitees

Secretary

Chairman

Doc. No. RESCO/HSE/F-1A/Rev.05 Annexure: 2.1 Date: 01.04.2022	FORMATION OF SITE SAFETY COMMITTEE	RESCO GLOBAL WIND SERVICES PVT. LTD.
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CIRCULAR

Date: DD/MM/YYYY

The safety committee is constituted with immediate effect as below;

Sr. No.	Name	Designation	Role
1.		Site In charge	Chairman
2.		Safety in Charge	Secretary
3.		Nominated Person	Co Secretary
4.			Member
5.			Member
6.			Member
7.			Member
8.			Member
9.			Member
10.			Member
11.			Member
12.			Member
13.		Technician	Member
14.		Supervisor/Casuals- Contractor	Member
4.		Invitees	Member

Periodicity

The committee will meet at least once in a month.

Circulation

Secretary will circulate the schedule of meeting in advance.

Gist of meeting will be minuted in the standard format and circulated to the following under the signature of secretary---

In absence of Secretary, nominated person/co secretary will take this responsibility.

1. Chairman 2. Head O&M/Infra
3. Members 4. Other Concerned
5. Invitees

Secretary

Chairman

Doc No.: IGESL/HSE/F-02/Rev.05 Annexure : 2.2 Date: 01.04.2022	MINUTES OF SAFETY COMMITTEE MEETING	INOXGreen ENERGY SERVICES LIMITED
--	--	---

Chairman		Date	
Secretary		Time	
Meeting No.		Location of Meeting	

Sr. No.	Member Present	Designation	Member Absent	Designation
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

INVITEES:

MOM Prepared By		Location		Date	
----------------------------	--	-----------------	--	-------------	--

Minutes of HSE Meeting

Sr. No.	Description of Discussion	Action By	Target Date	Remarks
1				
2				
3				
4				
5				
6				
7				

Doc No.: RESCO/HSE/F-2A/Rev.05 Annexure : 2.2 Date: 01.04.2022	MINUTES OF SAFETY COMMITTEE MEETING	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Chairman		Date	
Secretary		Time	
Meeting No.		Location of Meeting	

Sr. No.	Member Present	Designation	Member Absent	Designation
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

INVITEES:

MOM Prepared By		Location		Date	
----------------------------	--	-----------------	--	-------------	--

Minutes of HSE Meeting				
Sr. No.	Description of Discussion	Action By	Target Date	Remarks
1				
2				
3				
4				
5				
6				
7				

Site Inspection Checklist

Date/Time		Location		WTG's condition On/Off
Site		Cluster/Section	Reference PTW no:	
Frequency			Submitted to	
USS				
Sr no	Check points	Yes	No	Remarks
1	Are the USS yard Gate is locked?			
2	Ensure USS yard 9 Earth pits chambers is available in Good condition.			
3	Check yard fencing free from damage & corrosion.			
4	Check availability of 3 no's Fire buckets with Sand inside the yard.			
5	Yard cleaning- Free from grass, Bushes and unwanted material			
6	Check Yard light is glowing & their MCB boxes are in Good condition			
7	VCB/ C&R control panels door closed and secured:			
8	Check Transformer oil leakage/spillages over yard & level indicator is OK			
9	Check WTG's 3 Earth pit pipe, wall and cover is OK free from damage?			
10	Other If Any			
WTG				
1	Are the Turbine main entrance door is locked?			
2	Please specify if any abnormal sound coming from HUB/Nacelle.			
3	Is the site approach road condition is Good and free of muddy water.			
4	Is the turbine kept clean and tidy? (Ex: Good Housekeeping, Grass cutting)			
5	Check WTG's surrounding land cultivated by local or any observation?			
6	Check Tower walls are any Paint peel off/ scribble by unknowns?			
7	Fire Extinguisher available inside			
8	Rubber mats available in front off panel			
9	Relevant Safety Signs / Safety Stickers/Emergency Contact No/			

10	Ladder Condition is ok or not			
11	Panel door properly closed or not			
12	First aid kit available at & near work site			
13	Electrical equipment (viz. Electrical connections, Power distribution board etc.)& accessories checked for good working condition			
14	Other If Any			
Security				
1	Check Employees/Contractors are using PPE's work at site.			
2	Check and confirm presence of security personnel during site rounds?			
3	If any nuisances or ROW issues?			
4	Other If Any			
Environmental Assessment				
1	Any feathers/scavenged body parts of birds found around/inside WTG's/USS?			
2	Any Complaint about Noise/Other Grievance received from Indigenous peoples?			
3	Each & every (Waste) material which can harm environment has collected from site. If no please specify in detail & Intimate to Concern person immediately.			

Note: All Site Engineer's (each department) shall submit this format (after inspection) to concern HSE Lead within 7 days from inspection.

Doc. No. RESCO/HSE/F-3A/Rev.05 Annexure: 2.3 Date: 01.04.2022	Site Inspection Checklist	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Date/Time		Location		WTG's condition On/Off
Site		Cluster/Section	Reference PTW no:	
Frequency			Submitted to	
	USS			
Sr no	Check points	Yes	No	Remarks
1	Are the USS yard Gate is locked?			
2	Ensure USS yard 9 Earth pits chambers is available in Good condition.			
3	Check yard fencing free from damage & corrosion.			
4	Check availability of 3 no's Fire buckets with Sand inside the yard.			
5	Yard cleaning- Free from grass, Bushes and unwanted material			
6	Check Yard light is glowing & their MCB boxes are in Good condition			
7	VCB/ C&R control panels door closed and secured:			
8	Check Transformer oil leakage/spillages over yard & level indicator is OK			
9	Check WTG's 3 Earth pit pipe, wall and cover is OK free from damage?			
10	Other If Any			
	WTG			
1	Are the Turbine main entrance door is locked?			
2	Please specify if any abnormal sound coming from HUB/Nacelle.			
3	Is the site approach road condition is Good and free of muddy water.			
4	Is the turbine kept clean and tidy? (Ex: Good Housekeeping, Grass cutting)			
5	Check WTG's surrounding land cultivated by local or any observation?			
6	Check Tower walls are any Paint peel off/ scribble by unknowns?			
7	Fire Extinguisher available inside			

8	Rubber mats available in front off panel			
9	Relevant Safety Singes / Safety Stickers/Emergency Contact No/			
10	Ladder Condition is ok or not			
11	Panel door properly closed or not			
12	First aid kit available at & near work site			
13	Electrical equipment (viz. Electrical connections, Power distribution board etc.)& accessories checked for good working condition			
14	Other If Any			
Security				
1	Check Employees/Contractors are using PPE's work at site.			
2	Check and confirm presence of security personnel during site rounds?			
3	If any nuisances or ROW issues?			
4	Other If Any			
Environmental Assessment				
1	Any feathers/scavenged body parts of birds found around/inside WTG's/USS?			
2	Any Complaint about Noise/Other Grievance received from Indigenous peoples?			
3	Each & every (Waste) material which can harm environment has collected from site. If no please specify in detail & Intimate to Concern person immediately.			

Note: All Site Engineer's (each department) shall submit this format (after inspection) to concern HSE Lead within 7 days from inspection.

Doc. No. IGESL/HSE/F 05/Rev.05 Annexure: 2.5 Date: 01.04.2022	FEEDBACK CARD FOR MANAGEMENT PEOPLE/VISITOR VISITING AT SITE	
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Date & Time:		Inspected By:		Site, Section		
Sr No	Check Points	Excellent	Very Good	Good	Satisfactory	Need Improvement
1	Housekeeping					
2	PPE's Adherence at Site					
3	HSE related Display at Site					
4	Security Systems at Site					
5	Behavior of personal at Site					
Comments if any						

Doc. No. RESCO/HSE/F 5A/Rev.05 Annexure: 2.5 Date: 01.04.2022		FEEDBACK CARD FOR MANAGEMENT PEOPLE/VISITOR VISITING AT SITE			RESCO GLOBAL WIND SERVICES PVT. LTD.	
Date & Time:		Inspected By:		Site, Section		
Sr No	Check Points	Excellent	Very Good	Good	Satisfactory	Need Improvement
1	Housekeeping					
2	PPE's Adherence at Site					
3	HSE related Display at Site					
4	Security Systems at Site					
5	Behavior of personal at Site					
Comments if any						

Doc. No. IGESL/HSE/F-06/Rev.5 Annexure: 2.6		HEALTH ENVIRONMENT & SAFETY			
Date: 01.04.2022		MONTHLY HSE REPORT			
Report. No.:				Date: DD/MM/YYYY	
From:	HSE-Site Representative		DATE: From: DD/MM/YYYY to DD/MM/YYYY		
To :	HO Noida		MONTH:		
Project :			State:	Location:	
SL NO:	CONTENTS	UPTO PREVIOUS MONTH	CURRENT MONTH	CUMULATIVE	
1	Total Number of IGESL/ RESCO Staff at Site				
2	Total Number of Contractors Personnel at site				
3	Total No. of visitors				
4	Total Man Hours Worked (IGESL+CONTRACTORS)				
5	Safe Man Hours Achieved (Without Reportable Injury)				
6	Number of Tool Box Talk Conducted				
7	Number of Induction Training Conducted.				
8	Number of HSE Training Programs Conducted at site				
9	Total Training man hours (=no. of man heads trained x training hours)				
10	Total training man days (=total training				
11	Number of safety observations				
12	Number of Near miss incidents				
13	Number of First Aid Cases / Minor Injury Cases				
14	Number of Lost Time Injury Reportable [More Than 48 hrs. of Disablement] (staff + contractor)				
15	Accident causing fatal injury (Nos) (staff + contractor)				
16	Man - day lost due to Accidents [staff + contractor]				
17	Incident Frequency Rate (=No. of incidents x 10 ⁶ /Total man hours worked)				
18	Severity rate (= No. of man days lost x 10 ⁶ /Total man hours worked)				
19	Number of Permits Issued.				
20	Number of Housekeeping Inspections.				
21	Number of PPE Inspections.				
22	Number of tools / tackles inspection				
23	Number of Excavation Inspections.				
24	Number of Vehicle Inspections.				
25	Number of Safety Audits(Internal/External).				
26	Number of HSE Recognitions & Rewards.				
27	Number of disciplinary HSE Violation against employee				
28	Amount of Penalties on HSE Violation				
29	Number of safety committee meetings conducted				
30	Any specific initiative taken for HSE improvement				
31	Hazard Waste(Oil soaked cotton/Oil collected from site in KG/Ltr.				
32	Energy Consumption	Electricity (In MWH)			
		Water (In Mega Ltr.)			
		Fuel (In Ltr.)			
		Paper Rim (In No.)			
33	Hazard waste disposed				

34	Any feathers/scavenged body part of Bird found around/inside WTG's/USS?			
35	Any complaint about Noise/other grievances from indigenous peoples?			

Prepared by:-	Checked By:-
EHS-Site Representative	Manager- Site In Charge
Name:	Name:
Date: DD/MM/YYYY	Date: DD/MM/YYYY

Remarks: * "No." Working days counted

Doc. No. RESCO/HSE/F-6A/Rev.5 Annexure: 2.6 Date: 01.04.2022		HEALTH ENVIRONMENT & SAFETY MONTHLY HSE REPORT		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Report. No.:				Date: DD/MM/YYYY	
From:	HSE-Site Representative		DATE: From: DD/MM/YYYY to DD/MM/YYYY		
To :	HO Noida		MONTH:		
Project :			State:	Location:	
SL NO:	CONTENTS	UPTO PREVIOUS MONTH	CURRENT MONTH	CUMULATIVE	
1	Total Number of RESCO Staff at Site				
2	Total Number of Contractors Personnel at site				
3	Total No. of visitors				
4	Total Man Hours Worked (RESCO+CONTRACTORS)				
5	Safe Man Hours Achieved (Without Reportable Injury)				
6	Number of Tool Box Talk Conducted				
7	Number of Induction Training Conducted.				
8	Number of HSE Training Programs Conducted at site				
9	Total Training man hours (=no. of man heads trained x training hours)				
10	Total training man days (=total training man hours/8)				
11	Number of safety observations				
12	Number of Near miss incidents				
13	Number of First Aid Cases / Minor Injury Cases				
14	Number of Lost Time Injury Reportable [More Than 48 hrs. of Disablement] (staff + contractor)				
15	Accident causing fatal injury (Nos) (staff + contractor)				
16	Man - day lost due to Accidents [staff + contractor]				
17	Incident Frequency Rate (=No. of incidents x 10 ⁶ /Total man hours worked)				
18	Severity rate (= No. of man days lost x 10 ⁶ /Total man hours worked)				
19	Number of Permits Issued.				
20	Number of Housekeeping Inspections.				
21	Number of PPE Inspections.				
22	Number of tools / tackles inspection				
23	Number of Excavation Inspections.				
24	Number of Vehicle Inspections.				
25	Number of Safety Audits (Internal/External).				
26	Number of HSE Recognitions & Rewards.				
27	Number of disciplinary HSE Violation against employee				
28	Amount of Penalties on HSE Violation				
29	Number of safety committee meetings conducted				
30	Any specific initiative taken for HSE improvement				
31	Hazard Waste(Oil soaked cotton/Oil collected from site in KG/Ltr.				
32	Energy Consumption	Electricity (In MWH)			
		Water (In Mega Ltr.)			
		Fuel (In Ltr.)			
		Paper Rim (In No.)			
33	Hazard waste disposed				
34	Any feathers/scavenged body part of Bird found around/inside WTG's/USS?				
35	Any complaint about Noise/other grievances from indigenous peoples?				

Prepared by:-	Checked By:-
EHS-Site Representative	Manager- Site In Charge
Name:	Name:
Date: DD/MM/YYYY	Date: DD/MM/YYYY

Remarks: * “No.” Working days counted

Doc No.: IGESL/HSE/F-07/Rev.05 Annexure: 2.7		Weekly EHS Performance Report			
Date: 01.04.2022					
Date:	DD/MM/YYYY	Report for the Month of : 1 st /2 nd /3 rd /4 th / Week of Month _____			
Name of the Site					
Name of Site Head		Name of Safety Head Site			
Contact. No.		Contact. No.			
Email ID.		Email ID.			
A) SAFETY PERFORMANCE REPORT					
Sr. No.	Description	For Week : dd/mm/yy to dd/mm/yy			
1	Total Number of IGESL Staff at Site				
2	Total Number of Contractors personnel at site				
3	Total No. of visitors				
4	Total Man Hours Worked (IGESL+ Contractor)				
5	Number of Tool Box Talk conducted				
6	Number of induction training conducted				
7	Number of EHS training at site				
8	Total Training man-hours (=no. of man heads trained x training hours)				
9	Total training man days (=total training man-hours/8)				
10	Number of Safety observations				
11	Number of permit to work issued				
12	Number of inspections as per Annex 2.3				
13	Number of PPE's inspection				
14	Number of tools / tackles inspection				
15	Number of vehicle Inspection				
16	Number of safety audits (Internal/External)				
17	Any Complaint about Noise/Other grievance received from Indigenous peoples?				
18	Incident Statistics				
	FATAL	LWDC	FAC	FIRE	NM/INC
19	Details of Specific steps taken for SHE Performance Improvement:				
20	Area to be improved (Brief Description)				
Details of the Person Submitting the Report:					
Name :					
Designation :					

Doc No.: RESCO/HSE/F-7A/Rev.05 Annexure: 2.7		Weekly EHS Performance Report		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Date: 01.04.2022					
Date:	DD/MM/YYYY	Report for the Month of : DD/MM/YYYY to DD/MM/YYYY			
Name of the Site					
Name of Site Head		Name of Safety Head Site			
Contact. No.		Contact. No.			
Email ID.		Email ID.			
A) SAFETY PERFORMANCE REPORT					
Sr. No.	Description	For Week :			
1	Total Number of RESCO Staff at Site				
2	Total Number of Contractors personnel at site				
3	Total No. of visitors				
4	Total Man Hours Worked (RESCO+ Contractor)				
5	Number of Tool Box Talk conducted				
6	Number of induction training conducted				
7	Number of EHS training at site				
8	Total Training man-hours (=no. of man heads trained x training hours)				
9	Total training man days (=total training man-hours/8)				
10	Number of Safety observations				
11	Number of permit to work issued				
12	Number of inspections as per Annex 2.3				
13	Number of PPE's inspection				
14	Number of tools / tackles inspection				
15	Number of excavation inspection , if Applicable (Refer daily observation Report-Annex- 2.4)				
16	Number of vehicle Inspection				
17	Number of safety audits (Internal/External)				
18	Any Complaint about Noise/Other grievance received from Indigenous peoples?				
19	Incident Statistics				
	FATAL	LWDC	FAC	FIRE	NM/INC
20	Details of Specific steps taken for SHE Performance Improvement:				
21	Area to be improved (Brief Description)				
Details of the Person Submitting the Report:					
Name					
Designation					

Doc. No.: IGESL/HSE/F-08 /Rev. 05 Annexure: 2.8 Date:01/04/2022		ATTENDANCE SHEET			
Programme Name:		SAFETY COMMITTEE MEETING			
Venue					
Chaired By:					
Secretary:					
Date & Timing					
Sr. No.	Emp. Code	Name of Participants	Designation	Signature	
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Doc. No.: RESCO/HSE/F-8 A/Rev. 05 Annexure: 2.8 Date:01/04/2022		ATTENDANCE SHEET		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Programme Name:		SAFETY COMMITTEE MEETING			
Venue					
Chaired By:					
Secretary:					
Date & Timing					
Sr. No.	Emp. Code	Name of Participants	Designation	Signature	
1					
2					
3					
4					
5					
6					
7					
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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	SAFETY ORIENTATION & TRAINING	Guideline No IGESL SITE/HSE/003
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1. OBJECTIVE:

To ensure that all employees receive appropriate training which would enhance knowledge, skill, experience & behaviour or ensure their competency to execute their duties & responsibilities related to Safety, Health and environment aspects in their work activities because, Training must meet the needs of a project site in addition to complying with all National / Local requirements; specific training needs may include safe working Procedures, fire fighting, evacuation, implementation of health and safety for site work, workplace emergencies and first aid procedures. Safety training programmes shall be conducted by our Safety Officer at site and by the Safety Head from Head Office with an overall objective of controlling losses by helping people learn. The emphasis during the training shall be laid on inspiring / motivating them and to practice what they have learnt to "PRODUCE SAFELY".

2. SCOPE:

It covers activities of identification of training needs based on competency requirements and mapping, carrying out on the job training, classroom trainings, to assess & evaluate the effectiveness of training programs, to document & preserve the training records, to carry out training programs as per schedule to all employees including permanent employees , Contractual employees, etc.

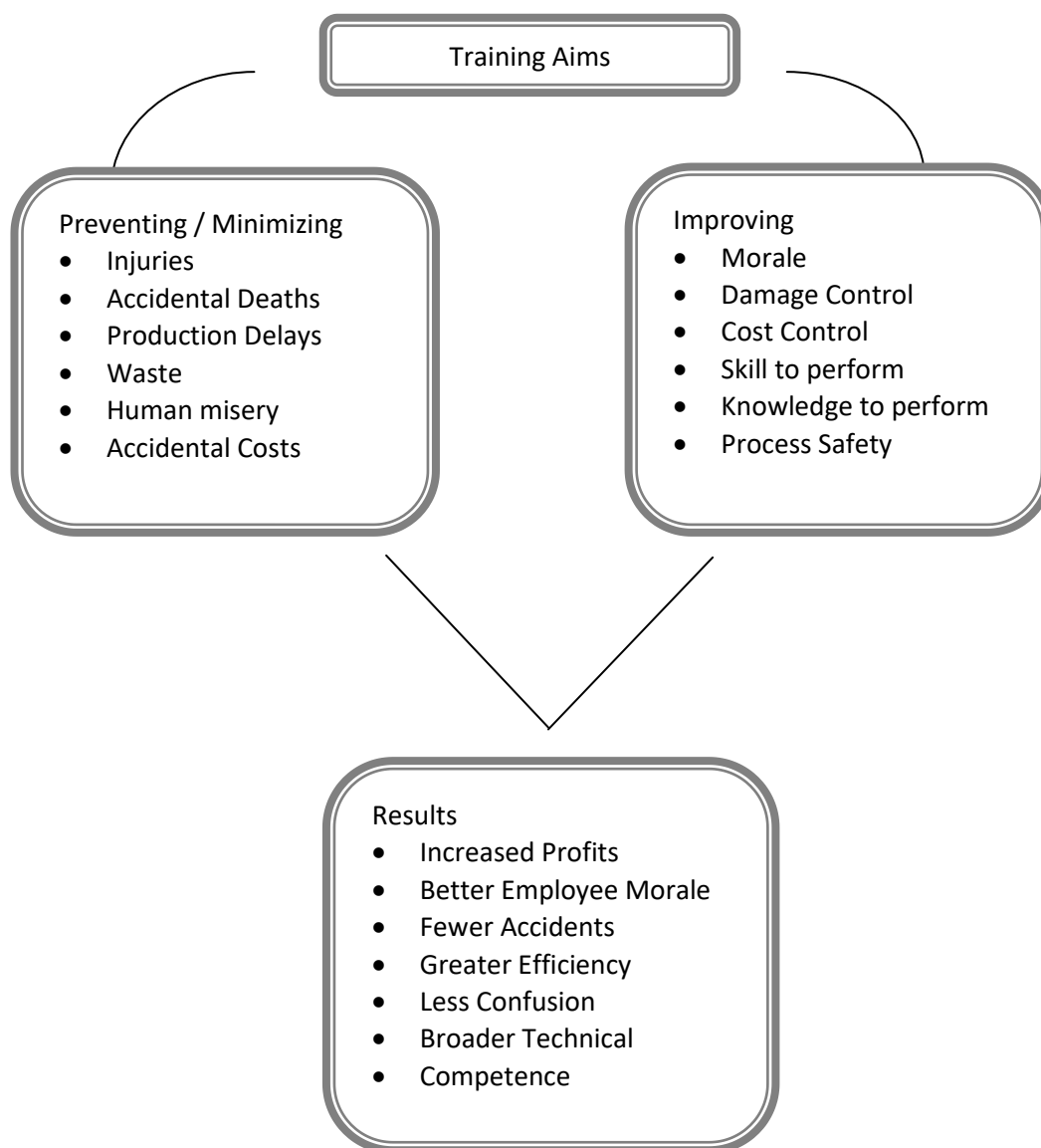
3. GENERAL GUIDELINES:

- I. Training should be conducted in accordance with approved and written training program / plan schedule.
- II. Training program should cover specific duties to be performed by the individuals.
- III. The training plan should include induction training and follow up training at regular intervals.
- IV. During on job training proper instructions should be given to take necessary precautions required during performing the job.
- V. Personnel working in areas prone to hazards should be given specific training.
- VI. During practical training, use of PPEs, proper devices such as rescue kit to be done
- VII. Training may be conducted by way of class-room / practical (fire extinguisher / rescue training at WTG) / tool box discussions at site level / train the trainer sessions.

Need based external trainings can be conducted by HSE, HRD & Concerned Department.

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4. TRAINING AID:

- A structured training module should be designed which can be easily imparted with help of audio.
- visual techniques, slide projectors, video films etc. and should consider the literacy and language part of the target audience
- The training programs should be more of interactive in nature, including more discussion, quiz case studies etc.
- The Training module should include various aspects Safety, Health and Environment topics.

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5. IDENTIFICATION OF TRAINING NEEDS:

- a. Identification of training needs is the basis of all the training activities. The same is also a part of Performance monitoring system of individual employees. The Training need shall be captured in the Competency Matrix (Annexure)
- b. The Functional heads in consultation with HRD will analyze need of training.
- c. Also the competency of the employee needs to be analyzed, especially of those employees whose work / activity is causing / can cause significant environmental impacts / safety hazards. For example, the workers involved in the working of Effluent Treatment Plant.
- d. Establish competency criteria for jobs that are highly hazardous (e.g. working at heights) or can cause significant impacts as objectively as possible.
- e. Verify the present available competency by checking the education, experience, training and incident records of the employees.
- f. Do the gap analysis between required competence and available competence.
- g. Plan the training based on above gap analysis.
- h. Following points are generally helpful in identification of training needs.
 - i. Job safety analysis HIRA/ (JSA) for individual work activities.
 - ii. Assessment of incidence reports.
 - iii. Observations made by department / section head.
 - iv. Assessment of feedback form.
 - v. Competency (including knowledge / skill, etc.) requirements for operational control measures to ensure no deviation of HSE aspects
- i. Training may also be required, if new employee is hired, employee is transferred to new job, procedures are changed, new process, material or equipment is introduced, objectives and / or targets are changed, new regulation affecting company's activities is introduced, or existing performance is not acceptable
- j. Contractors engaged in activities which may cause significant environmental impacts / potential safety hazards also need to be covered in competency-based training.
- k. The effect of the training imparted depends on the accurate identification of training needs and design of the training program.

6. EVALUATION OF TRAINEE / EMPLOYEE:

Before starting training & after completion of safety training as per the training procedure, written/oral test should be conducted (In special training only) and should be evaluated by trainer. Based on the evaluation the trainer/ department head should decide effectiveness of training.

- a. Retraining is identified in the following circumstances.
 - i. If any change of section or department.
 - ii. If any deficiencies are noticed in working, audits or performance reviews.
 - iii. Change in the work systems.

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7. NEW EMPLOYEE TRAINING ORIENTATION:

As well, inexperienced workers are generally involved in more accidents than veteran workers. Although experience increases safety awareness, early education in health and safety and job skills can improve the safety record for new workers right from the start.

a. A brief safety induction module for workers, supervisors and engineers shall include but not limited to;

- i. Safe working procedures.
- ii. Company's HSE Policy.
- iii. Role & Responsibilities.
- iv. When and how to use personal protective equipment
- v. Emergency procedures (Fire drill, Rescue drill etc.)
- vi. Electrical safety
- vii. Hazards in jobs
- viii. Incident & accident reporting procedure
- ix. Reporting of substandard conditions, unsafe conditions and unsafe acts.
- x. Health & Hygiene
- xi. Housekeeping
- xii. Materials Handling

b. Additional to the above Supervisors and Engineers shall be also trained in.

- i. Job safety analysis (JSA) & Hazard Identification and Risk Assessment (HIRA)
- ii. Work permit system in details.
- iii. Site safety rule & regulation.
- iv. Tool Box Talk / Pep talk.
- v. Induction training for new joiners.

HSE training details for Wind site employees & contractors

1. The Law and Safety	2. Policy and Administration
Statutory requirement	Effect of incentive on accident prevention
Appropriate regulations	Human relations
Duties of employer and employee	Consultation
	Safety Officer: duties, aims, objectives
3. Safety and the Supervisor	4. Principles of Accident Prevention
Safety and efficient production go together	Attitudes of management, supervision and operations
Accidents affect morale and public relations	Methods of achieving safe operations
	Accident and injury root causes
5. Site Inspection	6. Human Behavior
The role of management	Motivating agencies
Hazard Identification Procedure	Individual behavior
Records results	Environmental effects
Follow-up procedures	Techniques of persuasion
Feedback	
7. Site housekeeping	8. Health
Site organization	Medical examination

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Relationship of site housekeeping to accident occurrence	Hazard to health on site
Site access	Sanitation and welfare
Equipment storage	Protective clothing
Material stacking	First Aid/CPR
Materials handling	
9. Personal Protective Equipment	10. Electricity
Eye, face, hands, feet and legs	Appreciation of electrical hazards
Respiratory protective equipment	Power tools
	Lighting and power system on sites ELCB, RRCB,
	Grounding/Ground fault circuit interrupters (GFCIs)
13. Transportation	14. Excavations
Transport to and from site	Method of shoring
Hazard connected with site transport	Precautions while shoring
Competent drivers	Precautions at edge of excavations
Dumpers	Removal of shoring
Tipping trucks	Sheet steel piling
Movement near excavations	
15. Working platforms, Ladders, and Scaffolding	16. Cranes and other Lifting Machines During WTG Installation
Hazards connected with the use of ladders	Licensing, certification and training required for operation of cranes
Maintenance and inspection	Slinging methods
Type of scaffold	Signaling
Overloading	Access to crane(s)
Work on roofs	Maintenance and examination
Fragile material	Ground conditions
Openings in walls and floors	Hazards and accident prevention methods connected with the use of different types of cranes/heavy equipment
Use of safety belts and nets	Crane Lift Plan for all lifts
17. Lifting Tackle	18. Fire Prevention and Control
Slings - single and multi-legged	Principle causes determining fire
Safe working loads (SWLs)	Understanding fire chemistry
Safety hooks and eyebolts	Firefighting equipment
Cause of failure	Fire fighting training
Maintenance and examination	
19. Communications	
Effective methods of communication (particular interest to non-English speaking workers)	
Method and preparation of reports	
Safety committees	
Safety meeting	

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8. HSE PROMOTION:

The objective of safety promotion is to develop and maintain safety awareness amongst all personnel of the Wind Site.

Commitment to safety and ensure active participation of every employee in the management HSE implementation program.

- a. POSTERS AND SIGNS:** Posters and signs shall be adopted as visual aids for accident and fire prevention. Posters published by the National Safety Council and other agencies carrying topical message on **HSE** will be displayed at prominent locations.

And location specific mandatory posters and signage must be there in site.

b. SAFETY HANDBOOK AND BROCHURES

To increase safety awareness and as part of personnel safety training, safety handbook or brochures will be issued.

c. PENALTIES AND FINES

The management has decided to implement a policy for safety violations wherein the violator will be penalized/ fined as per consequence management policy. The safety Engineer shall provide additional information for violations involving penalties/ fines.

d. HSE INCENTIVE PROGRAM

The site management will develop a procedure to recognize and acknowledge good safety performance by individuals, teams or the subcontractors. The development of the **HSE** Incentive Program (REWARD & RECOGNITION), which includes how it should run and types of awards, will be developed with the consensus of the site Safety Committee. The **HSE** Incentive Program will be implemented within six months of the commencement of work.

e. HSE TRAINING:

The objective of safety training is to equip personnel with the knowledge, skill and attitude, which will enable them to perform duties in a safe manner.

f. PROCEDURE

All workers and supervisors are required to be trained in the potential hazards that may exist on a construction job site, elimination of hazards and the procedure to be followed to perform all work safety. The safety Engineer shall in consultation with the project Manager/ site Engineers arrange training program for staff and workers.

g. HSE INDUCTION PROGRAM

All the personnel engaged for construction of this project shall undergo a Safety Induction training on basic safety requirements of the project and significant features of the construction work relating to the safety when he/ HSE arrives at site. The Safety Engineer or his subordinate shall conduct such training. A record of the same shall be maintained.

h. OBJECTIVES

- i. The primary objectives of the **HSE** induction training are to:
- ii. Stress the importance of safety
- iii. Basic principles of accident prevention.
- iv. Contribute to developing site Safety.
- v. Guide employee in exercising safe working conditions.

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- vi. Stress the importance to meet the safety conditions.
- vii. Stress the importance of good housekeeping.
- viii. Instruct on the proper use of personnel protective equipment.
- ix. Inform employees of the Emergency Evacuation Procedure.
- x. Highlight main hazards/risks involved in the works.
- xi. To explain Safety Rules & Regulation implemented on the wind site.
- xii. The safety induction training will also serve to inform all personnel that failure to work safely and follow safe practice will result in disciplinary action, which may include expulsion from the Job.

i. HSE TRAINING FOR WIND SITE STAFF

Management training is intended to provide the knowledge, motivation, and skill necessary to manage the safety and health / loss control program. All Engineers/ supervisors/ Foremen shall be exposed to training program as per below mention contents. Such training will be conducted in consultation with Head-corporate safety.

HSE TRAINING CHART

Sr. No.	DESCRIPTION	GROUP	PERIOD	CONDUCTED BY
1.	HSE induction briefing	All	While joining	HSE team
2.	HSE management programme	Project in-charge, O & M in-charge(state head) section heads, Engineers	Quarterly	HSE Manager
3.	Trade and skill training	Site engineer/ Supervisor	Every 2 months from start of work	In-house or institutional
4.	Safety motivation programme (Audio visual)	Workers/Supervisors/Engineers	Quarterly	HSE Manager in coordination with Project/ O & M , in-charge(state head)
5	Other Safety Training e.g.(Fire protection, Rescue system, statutory requirements, Health emergencies, Environmental programme, and other wind farm activities related safety training etc.	Workers/Supervisors/Technicians/Engineers/Specific team members	Quarterly	HSE Manager in coordination with Project/ O & M , in-charge(state head)

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b. OTHER SAFETY TRAINING:

Other safety training such as JSA training for all engineers and supervisors, emergency preparedness, first aid and fire fighting training will be developed and carried out by the Safety department in conjunction with the relevant body or organization.

Safety training will be a continuous exercise and will be regularly imparted through refresher courses, seminars, talks, symposiums etc.

c. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head -GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding

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Doc. No. IGESL/HSE/F-09/Rev.05 Annexure – 3.1 Date: 01.04.2022	Safety Induction Training Format		
Date & Time		Location	
Name of the Trainer		Duration	

Topics Covered:

- | | |
|--|--|
| 1. Introduction with employee. | 8. Safety booklet. |
| 2. Introduction about company. | 9. Industry Specific Hazards. |
| 3. Roles & Responsibilities | 10. Environmental Aspects and Impacts. |
| 4. Brief about HSE Manual. | 11. Usages of PPE'S. |
| 5. Brief about Cardinal Safety Rules. | 12. Brief of Inspection reports and Formats. |
| 6. Emergency preparedness. | 13. Brief about First aid. |
| 7. Scope of work and O&M/Project Overview. | 14. Legal and Statutory requirements. |

Sl. No	Name of the Employee	Designation	Department	Signature
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Signature of Safety Officer

Signature of Department Head

Doc. No. RESCO/HSE/F-9A/Rev.05 Annexure – 3.1 Date: 01.04.2022	Safety Induction Training Format		RESCO GLOBAL WIND SERVICES PVT. LTD.
Date & Time		Location	
Name of the Trainer		Duration	

Topics Covered:

- | | |
|--|--|
| 1. Introduction with employee. | 8. Safety booklet. |
| 2. Introduction about company. | 9. Industry Specific Hazards. |
| 3. Roles & Responsibilities | 10. Environmental Aspects and Impacts. |
| 4. Brief about HSE Manual. | 11. Usages of PPE'S. |
| 5. Brief about Cardinal Safety Rules. | 12. Brief of Inspection reports and Formats. |
| 6. Emergency preparedness. | 13. Brief about First aid. |
| 7. Scope of work and Project Overview. | 14. Legal and Statutory requirements. |

Sl. No	Name of the Employee	Designation	Department	Signature
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Signature of Safety Officer

Signature of Department Head

Doc. No. IGESL/HSE/F-10/Rev.05 Annexure – 3.2 Date: 01.04.2022	Tool Box Talk (TBT) Training Format	
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Project / Site:		Date:	
Conducted By:		Time:-	
Contractor M/s:-		Site/Plant In Charge:	
Topics :-			
S. No.	Name of the Employee/ Participants	Designation/Category	Signature
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Signature of Safety Officer

Signature of Dept. Head

Doc. No. RESCO/HSE/F-10A/Rev.05 Annexure – 3.2 Date: 01.04.2022	Tool Box Talk (TBT) Training Format	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Project / Site:		Date:	
Conducted By:		Time:-	
Contractor M/s:-		Site/Plant In Charge:	

Topics :-

S. No.	Name of the Employee/ Participants	Designation/Category	Signature
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Signature of Safety Officer

Signature of Dept. Head

Date : 01.04.2022

INOX GREEN ENERGY SERVICES LIMITED
ENVIRONMENT HEALTH & SAFETY
TRAINING CALENDER



WIND SITE / PROJECT NAME:

LOCATION:

SL NO	TRAINING TOPIC	PROPOSED DURATION	PROPOSED FACULTY	PROPOSED PARTICIPANTS	SCHEDULE: YEAR												REMARKS
					JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
1	SAFETY INDUCTION	4 HRS /1 HRS	SAFETY OFFICER	STAFF & CONTRACT WORKER	P	P											To all new joining at site at least(4 hrs to staff &1 hrs to workers)
				A													
2	USE OF PPE	1 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P	P						P					
				A													
3	TOOLS & TACKLES SAFETY	1 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P		P						P				
				A													
4	WORKING AT HEIGHT	1 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P			P						P			
				A													
5	ELECTRICAL SAFETY	1 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P				P						P		
				A													
6	FIRE SAFETY & FIRST AID	2 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P					P						P	
				A													
7.	BANKSMAN TRAINING	1 HRS	SAFETY OFFICER / MECH. ENGINEER	STAFF & CONTRACT WORKER	P						P						
				A													
8.	CONFINED SPACE	1 HRS	SAFETY OFFICER / MECH. ENGINEER	STAFF & CONTRACT WORKER	P	P											
				A													
9.	EXAVATION PROCEDURE TRAINING	1 HRS	SAFETY OFFICER / CIVIL ENGINEER	STAFF & CONTRACT WORKER	P							P					
				A													
10.	WORK PERMIT TRAINING	1 HRS	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P	P											
				A													
11.	JSA TRAINING	1 HRS.	SAFETY OFFICER / SITE ENGINEER	STAFF & CONTRACT WORKER	P	P											
				A													

INOX GREEN ENERGY SERVICES LIMITED

ENVIRONMENT HEALTH & SAFETY

TRAINING CALENDER

**WIND SITE / PROJECT NAME:**

LOCATION:

[illegible]

Note: Applicable for all IGESL & RESCO sites.

Doc. No.: IGESL/HSE/F-12/Rev.05 Annexure: 3.4 Date:01/04/2022		TRAINING ATTENDANCE SHEET		
Programme Name:				
Venue				
Faculty				
Date & Timing				
Sr. No.	Emp. Code	Name of Participants	Designation	Signature
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Doc. No.: RESCO/HSE/F-12A/ Rev.05 Annexure: 3.4 Date:01/04/2022		TRAINING ATTENDANCE SHEET		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Programme Name:					
Venue:					
Faculty:					
Date & Timing:					
Sr. No.	Emp. Code	Name of Participants	Designation	Signature	
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Doc No.: IGESL/HSE/F-13/ Rev.05 Annexure-3.5 Date: 01.04.2022	Training Need Identification Format (To be identified by HR)	
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Employees Name: -
Designation: -

Location:-
Department:-

I proposed the following training and development for the Month

Functional/Technical			Behavioural		
Proposed area/subject of Development.	Criticality (1,2,3)	By when(Specify the Month)	Proposed Area/Subject of Development	Criticality (1,2,3)	By when (specify the Month)

Name and signature of recommending officer: _____

Explanation:-

Criticality

1. High criticality, required at the earliest on the job.
2. Medium Criticality would help in better performance, not immediate.
3. Good to know.

Functional /technical training:- These are the training inputs essential for effectively performing the roles and responsibilities of a job as per K.R.A. These may also be inputs for learning new skills required for new responsibilities.

E.g. - Erection, Permit to work, pre-commissioning, LOTO etc.

Behavioural training:- These are the training inputs required for the enhancement of soft-skills and continuously achieve personal development.

E.g.-Communication skills, frequent intentional safety follow up, presentation skills, etc.

Doc No.: RESCO/HSE/F-13A/ Rev.05 Annaxure-3.5 Date: 01.04.2022	Training Need Identification Format (To be identified by HR)	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Employees Name: -
Designation: -

Location:-
Department:-

I proposed the following training and development for the Month

Functional/Technical			Behavioural		
Proposed area/subject of Development.	Criticality (1,2,3)	By when(Specify the Month)	Proposed Area/Subject of Development	Criticality (1,2,3)	By when (specify the Month)

Name and signature of recommending officer: _____

Explanation:-

Criticality

1. High criticality, required at the earliest on the job.
2. Medium Criticality would help in better performance, not immediate.
3. Good to know.

Functional /technical training:- These are the training inputs essential for effectively performing the roles and responsibilities of a job as per K.R.A. These may also be inputs for learning new skills required for new responsibilities.

E.g. - Erection, Permit to work, pre-commissioning, LOTO etc.

Behavioural training:- These are the training inputs required for the enhancement of soft-skills and continuously achieve personal development.

E.g.-Communication skills, frequent intentional safety follow up, presentation skills, etc.

Doc No.: IGESL/HSE/F-14/ Rev.05 Annexure: 3.6 Date: 01.04.2022	TRAINING FEEDBACK/EVALUATION FORM	
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Date of training:	
Topic of the training program:	
Location of training:	
Name of the trainer:	

Instructions: Please indicate your level of agreement with the statements listed below in #1-11.

Sr. No.	Topics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The objectives of the training were clearly defined	☐	☐	☐	☐	☐
2	Participation and interaction were encouraged.	☐	☐	☐	☐	☐
3	The topics covered were relevant to me.	☐	☐	☐	☐	☐
4	The content was organized and easy to follow.	☐	☐	☐	☐	☐
5	The materials distributed were helpful.	☐	☐	☐	☐	☐
6	This training experience will be useful in my work.	☐	☐	☐	☐	☐
7	The trainer was knowledgeable about the training topics.	☐	☐	☐	☐	☐
8	The trainer was well prepared.	☐	☐	☐	☐	☐
9	The training objectives were met.	☐	☐	☐	☐	☐
10	The time allotted for the training was sufficient.	☐	☐	☐	☐	☐
11	The meeting room and facilities were adequate and comfortable	☐	☐	☐	☐	☐

12. What did you like most about this training?
13. What aspects of the training could be improved?
14. What did you like most about this training?
15. What aspects of the training could be improved?
16. How do you hope to change your practice as a result of this training?
17. Please share any other comments here:

Trainee Name:

Employee Code:

Company Name:

Signature:

THANK YOU FOR YOUR FEEDBACK!

Doc No.: RESCO/HSE/F-14A/ Rev.05 Annexure: 3.6 Date: 01.04.2022	TRAINING FEEDBACK/EVALUATION FORM	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Date of training:	
Topic of the training program:	
Location of training:	
Name of the trainer:	

Instructions: Please indicate your level of agreement with the statements listed below in #1-11.

Sr. No.	Topics	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	The objectives of the training were clearly defined	☐	☐	☐	☐	☐
2	Participation and interaction were encouraged.	☐	☐	☐	☐	☐
3	The topics covered were relevant to me.	☐	☐	☐	☐	☐
4	The content was organized and easy to follow.	☐	☐	☐	☐	☐
5	The materials distributed were helpful.	☐	☐	☐	☐	☐
6	This training experience will be useful in my work.	☐	☐	☐	☐	☐
7	The trainer was knowledgeable about the training topics.	☐	☐	☐	☐	☐
8	The trainer was well prepared.	☐	☐	☐	☐	☐
9	The training objectives were met.	☐	☐	☐	☐	☐
10	The time allotted for the training was sufficient.	☐	☐	☐	☐	☐
11	The meeting room and facilities were adequate and comfortable	☐	☐	☐	☐	☐

18. What did you like most about this training?
 19. What aspects of the training could be improved?
 20. What did you like most about this training?
 21. What aspects of the training could be improved?
 22. How do you hope to change your practice as a result of this training?
 23. Please share any other comments here:

Trainee Name:

Employee Code:

Company Name:

Signature:

THANK YOU FOR YOUR FEEDBACK!

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	PERSONAL PROTECTIVE EQUIPMENTS (PPE's)	Guideline No IGESL SITE/HSE/004
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1. OBJECTIVE:

Operations always imply potential health hazards so personal protective equipment play significant role in reducing the intensity and preventing injury in case of any accident during the course of construction or other operational activities. As it is not possible to treat every possible danger by appropriate design measures suitable Personal Protective Equipment (PPE) must be used to prevent injuries. The PPE should be of standard make and confirm to IS specifications.

2. MINIMUM REQUIREMENTS:

Every person entering the restricted area of a project site shall be in possession of minimum PPE. For visitors helmets and shoes are to be provided as a lent out. It is every Employee's/ contractor's/subcontractor's own responsibility to ensure that his personnel are in possession of the necessary PPE.

Head Protection

- Safety helmets with chin strap shall be worn at all times during the stay inside the Restricted Area of a Project site.
- The use of labels is discouraged, as the adhesives may affect the helmet's material. Safety helmets made of plastic shall be replaced every three years. Any helmet damaged or exposed to heavy impact whether damage is apparent or not shall be replaced immediately.
- Additional requirement in head protection may be welding helmets as well as special helmets for working under high voltage lines.

Foot Protection

- Safety footwear shall be worn at all times in the Restricted Area of a Project site. It must be worn at least when operational, maintenance, construction, demolition or inspection work is being carried out.
- Additional foot protection for electrical hazards (people working with HV equipment may be required. Other requirements may be due to corrosive or other hazardous material requiring suitable protection.
- Shoes should be of better construction and must be antistatic if the work is being done in close proximity of process areas.

Body protection

- Body protection shall be worn to prevent injuries caused by absorption of hazardous chemicals, severe cuts or lacerations, severe abrasions, punctures and harmful temperature extremes.
- Cotton clothing or clothing made from other antistatic materials are preferred over other type of work clothing's. No nylon or purely synthetic fibre cloths should be worn in proximity of process areas. Use of cotton Boiler suit for climbing to the tower and for all operational team.
- Work clothes for operators shall be clean and properly fastened with cuffs secured to prevent loose clothing becoming caught in moving or rotating machinery. Loose clothing must not be worn.
- Clothes contaminated with oil, chemicals or toxic substances may be a fire hazard or lead to skin disease or other illnesses and shall be laundered.
- Additionally for working with corrosive chemicals where there is a chance of material spilling on to body, full protection of body by wearing full body chemical suits may be necessary.
- At the same time proximity suits may be required for working in close proximity of high heat radiating atmosphere and fire fighting.
- Flash fire proof suits/HRC suit/Arc flash suit come handy when work is to be done in such area where a flash fire may be anticipated in extraordinary situations.

Hand Protection

- Gloves made from cotton or fabric blends shall be worn to improve grip when handling slippery objects. They also insulate hands from mild heat or cold. While executing tasks that could cause injuries from sparks or scraping against rough surfaces, leather gloves shall be worn. It is recommended to use gloves with a combination of both materials.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	PERSONAL PROTECTIVE EQUIPMENTS (PPE's)	Guideline No IGESL SITE/HSE/004
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- b. Requirement of disposable gloves for first aid treatment, use of rubber / Nitrile gloves while dealing with corrosive chemicals, asbestos gloves while working with high temperature equipment etc.
- c. Standard & Specific hand gloves to be used in the electrical handling of 5KV, 11KV, 15KV, 22KV, 33KV.

Additional requirement

The Safety officer shall ensure that a formal assessment has been conducted for all activities to ascertain the need for further Personal Protective Equipment for the employees. An assessment of physical hazards and of the hazardous materials being handled shall be made and shall draw up schedule of the PPE required for each operation. Sufficient PPE shall be available in the sizes necessary to enable at least one change of outer clothing and two changes of underclothing if necessary. There shall also be sufficient PPE for immediate rescue operations. The activities of the subcontractors regarding the selection and use of PPE shall be monitored by the Safety officer.

Eye and Face protection

- a. Safety goggles must be worn while performing construction activities like Grinding, Gas cutting, Sand blasting etc. Other face protection requirements includes welding (welding face shield), Splash of chemicals (full face shield) and spray protection (safety glasses)
- b. It must be understood that ordinary glasses do not provide protection against special hazards.

Hearing Protection

Regular exposure of employees to noise, particularly in the workplace, can result in damage to hearing. In order to safeguard the hearing of employees engaged in operations that involve exposure to noise. In high noise area where noise exceeds 85 dB A (for 8 hrs shift), suitable hearing protection by virtue of using either ear plugs or ear muffs as per requirement.

Respiratory Protection

- a. Areas having either heavy dust or chemical vapors may require use of suitable respiratory protection. For need of the same work zone monitoring may be considered for identification of areas requiring such protection. Dust mask for dust protection and cartridge type filter mask to be used for specific chemical vapors as per suitability.
- b. Continuous airline or Self Contained Breathing Apparatus may be required while performing work in oxygen deficient or toxic atmosphere. The normal filter type masks shall never be used for such applications.

Fluorescent Jackets

Ensure that all the worker wear the fluorescent jackets while performing project work at wind site.

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Mandatory PPEs to be use at site as per matrix bellow.

SL NO	TYPE OF WORK	REQUIRED PPE
1	Concreting work	Nose mask, rubber hand gloves, gum boot, safety goggles, helmet.
2	Welding /cutting/grinding.	Welding/face screen, apron, hand gloves, leg guard, and safety shoes.
3	Rock breaking	Ear muffs ,safety goggles, helmet, safety shoes, hand gloves
4	Electrical work	Electrical hand gloves, safety shoes.
5	Work at height	Full body safety harness with double lanyard, fall arrester, safety shoes, helmet.
6	Tower Climbing	Full body safety harness with double lanyard, fall arrester, safety shoes, helmet, hand gloves, Boiler suit.
7	HT Line work	Full body safety harness with double lanyard, fall arrester, safety shoes, helmet, hand gloves-33 KV.
8	Transformer Charging	Fire Suit, Helmet, Safety Shoes, hand gloves-33 KV.
9	Material Handling	Helmet,, Safety Shoes, Hand gloves,
10	Electrical Work	Full body safety harness with double lanyard, fall arrester, safety shoes, helmet, hand gloves-33 KV.

3. SUITABILITY, COMPATIBILITY & TRAINING:

- a. Personal Protective Equipment is not suitable unless it:
 - i. Takes account of ergonomic requirements and the state of health of the person who wears it.
 - ii. Is capable of fitting the wearer correctly.
 - iii. Is effective to prevent or adequately control risks involved without increasing the overall risk.
- b Where more than one item of PPE is used, it must be compatible with other items used at the same time. This has to be checked by the Safety Person at site.
- c. The Safety Officer shall provide adequate information, instruction and training to enable users of PPE to know:
 - i. The risks which personal protective equipment will avoid or minimize.
 - ii. The purpose for which and manner in which personal protective equipment is to be used.
 - iii. Any action which the employee might take to ensure that personal protective equipment remains effective and in good condition.

4. STORAGE AND MAINTENANCE:

- a. For IWISL employees, Safety Officer shall be responsible for authorizing issuance of PPEs.
- b. The sufficient inventories of PPEs shall be maintained and records kept and updated regularly.
- c. There shall also be sufficient PPEs for immediate rescue operation as well as for emergency use. The safety officer shall make availability for all PPEs. The Safety officer shall make inventory of all PPEs. All such inventory shall be maintained by store in the site, The Store In charge shall update the safety officer of the stock,
- d. Responsibilities of maintenance of the PPEs and at the same time getting it replaced when these are not suitable for further use rests with the individual issued with such PPEs.

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- e. Safety Officer shall approve the quality of the PPEs being used.
- f. Preferably a display of available PPEs may be made in showcase to enhance the awareness and usage of the same.
- g. In case of loss of PPEs by employee, the same shall be replaced to him and payment by the individuals.

Inspection and Testing of PPE'S

All personal protective equipment should be inspected & checked by the competent supervisor at least in quarterly frequency and keep its record as per specific annexure.

5. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head -GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Doc. No. IGESL/HSE/F-15/Rev.05 Annexure: 4.1 Date: 01.04.2022	INOX GREEN ENERGY SERVICES LIMITED PPE INSPECTION REPORT	
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Inspected by:	DATE:	
Project / Site : –	Name of Dept. / Contractor-	Total Number
		Inspected :

INSTRUCTIONS:										
1.	All parts of the safety helmet (hard shell, inner shock absorber, & chin strap) Safety shoe (Leather condition, sole, steel toe guard) Hand gloves and safety goggles are to be checked for excessive wear and damage.									
2.	"P" is for "Passed Inspection" "F" is for "Failed Inspection".									
3.	"NP" Not Provided									
4.	"N /A"-Not Applicable									

S NO	EMPLOYEES / ISSUEE NAME	Designation	Helmet	Hand gloves	Safety Shoes	Gum boot	Fall Arrester	Safety Harness	Safety Goggles	Others
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Remarks if any-
Safety officer Signature:
Site In-charge Signature:

Doc. No. RESCO/HSE/F-15A/Rev.05 Annexure: 4.1 Date: 01.04.2022		PPE INSPECTION REPORT					RESCO GLOBAL WIND SERVICES PVT. LTD.				
Inspected by:							DATE:				
Project / Site : –		Name of Dept. / Contractor-					Total Number				
							Inspected :				
INSTRUCTIONS:											
1.		All parts of the safety helmet (hard shell, inner shock absorber, & chin strap) Safety shoe (Leather condition, sole, steel toe guard) Hand gloves and safety goggles are to be checked for excessive wear and damage.									
2.		"P" is for "Passed Inspection" "F" is for "Failed Inspection".									
3.		"NP" Not Provided									
4.		"N / A"-Not Applicable									
S NO	EMPLOYEES / ISSUEE NAME	Designation	Helmet	Hand gloves	Safety Shoes	Gum boot	Fall Arrester	Safety Harness	Safety Goggles	Others	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											

Remarks if any-	
Safety officer Signature:	
Site In-charge Signature:	

Relevant Standard	Description with examples			Symbol
Welding chaps and welding jacket (may also use coverall welding suit) <i>Shall comply with EN 470. See also ISO 11611</i>				EN407 
Protective coverall suit. <i>Shall comply with EN 463-EN 469. See also EN 340</i>				
High visibility vest ISO20471	Class 1,2 or 3			
ISO 10333 Personal fall arrest equipment <i>Shall comply with EN 360-EN 365. Class D,E,L & P</i>	Harness (chest and back side D-rings and breaking strain of 2272kg), and rope, lanyards or self-retracting lanyard (shock absorbing not to exceed 1.72m in length) shall be worn for any work done over 2m high			Class D for controlled descent Class E for confined spaces Class L for fall arrest whilst ladder climbing Class P for work positioning.
Foul weather clothing EN 343				
Buoyancy aids ISO 12402 1-10 ISO 15027 for immersion suits	(a) Buoyancy aid 50 – Swimmers only – not a life jacket. (b) Life jacket 100 – Sheltered waters. (c) Life jacket 150 – Offshore, foul weather clothing. (d) Life jacket 275 – Offshore, extreme conditions and heavy protective clothing.			 
3 rd Party protection where other persons may be affected by ABB activities	ABB activities need to be segregated from other person particularly in respect of electrical work			
iv. Footwear				
Safety footwear-shoes and rubber boots with toe protection. <i>Shall comply with ISO 20345</i>				Slip on shoes for visitors
Note: For protection against arc flash (EN 61482) see separate guidance.				

PPE Reference Format

RESCO GLOBAL WIND
SERVICES PVT. LTD.

Relevant Standard	Description with examples			Symbol
Welding chaps and welding jacket (may also use coverall welding suit) <i>Shall comply with EN 470. See also ISO 11611</i>				EN407 
Protective coverall suit. <i>Shall comply with EN 463-EN 469. See also EN 340</i>				
High visibility vest ISO20471	Class 1,2 or 3			
ISO 10333 Personal fall arrest equipment <i>Shall comply with EN 360-EN 365. Class D,E,L & P</i>	Harness (chest and back side D-rings and breaking strain of 2272kg), and rope, lanyards or self-retracting lanyard (shock absorbing not to exceed 1.72m in length) shall be worn for any work done over 2m high			Class D for controlled descent Class E for confined spaces Class L for fall arrest whilst ladder climbing Class P for work positioning.
Foul weather clothing EN 343				
Buoyancy aids ISO 12402 1-10 ISO 15027 for immersion suits	(a) Buoyancy aid 50 – Swimmers only – not a life jacket. (b) Life jacket 100 – Sheltered waters. (c) Life jacket 150 – Offshore, foul weather clothing. (d) Life jacket 275 – Offshore, extreme conditions and heavy protective clothing.			 
3 rd Party protection where other persons may be affected by ABB activities	ABB activities need to be segregated from other person particularly in respect of electrical work			
iv. Footwear				
Safety footwear-shoes and rubber boots with toe protection. <i>Shall comply with ISO 20345</i>				Slip on shoes for visitors
Note: For protection against arc flash (EN 61482) see separate guidance.				

Doc. No: IGESL/HSE/F-17 /Rev 05 Annexure- 4.3		PHYSICAL INSPECTION CHECKLIST FOR ELECTRICAL HAND GLOVES			
Date: 01.04.2022					
Name of User /Employee :		Issued Date:			
Make/Model/Sr. No.					
Name/ Location of site :					
Date of Inspection :					
Sr No	Parameters / Description	What to check	STATUS (OK/NOT OK)	Remark	
1	Standard / Specifications	Check IS / EN Mark & number IS 4770, EN 60903,ASTM D120			
2	Validity	Date of Manufacturing			
3	Voltage Rating	Check appropriate type of Class Rating hand gloves are being used as defined in IS 4770 OR ASTM D120			
4	Abrasion and scratches	Check for abrasion and scratches on hand gloves		Non replaceable /Non-repairable	
5	Age crack	Check for age cracks		Non replaceable /Non-repairable	
6	Hard spots	Check for Hard spot due to excessive heat exposure or other reason.		Non replaceable /Non-repairable	
7	Cuts	Check for cuts Caused by wood or Metal planter or other sharp edge		Non replaceable /Non-repairable	
8	Puncture	Check for small hole Caused by wood or Metal planter or other sharp edge		Non replacable /Non-repairable	
		Air Pressure Test: Fill the glove with air & hold against your cheek to feel for & hear releasing air			
9	Contamination	Check for contamination by petroleum product like Diesel,petrol, Grease etc		Cleanings/Washable	
10	Inner cotton Gloves/HRC	Check for Cut, Teared up,contamination by Oil grease etc.		Non replaceable /Non-repairable	
Inspection Result & Remark: If any one point is "NOT OK" then discard the PPE from use unless damaged part replaced					
☐ This PPE can be continued for use		☐ This PPE shall be discontinued from use till damaged part replaced (if possible)		☐ This PPE shall be discarded / discontinued from use	
Inspection done By :				Signature:	
Designation					
Name of HSE person or site Incharge or designated person:				Signature:	

Doc. No: RESCO/HSE/F-17A /Rev. 05 Annexure- 4.3		PHYSICAL INSPECTION CHECKLIST FOR ELECTRICAL HAND GLOVES		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Date: 01.04.2022					
Name of User /Employee :		Issued Date:			
Make/Model/Sr. No.					
Name/ Location of site :					
Date of Inspection :					
Sr. No	Parameters / Description	What to check	STATUS (OK/NOT OK)	Remark	
1	Standard / Specifications	Check IS / EN Mark & number IS 4770, EN 60903,ASTM D120			
2	Validity	Date of Manufacturing			
3	Voltage Rating	Check appropriate type of Class Rating hand gloves are being used as defined in IS 4770 OR ASTM D120			
4	Abrasion and scratches	Check for abrasion and scratches on hand gloves		Non replaceable /Non-repairable	
5	Age crack	Check for age cracks		Non replaceable /Non-repairable	
6	Hard spots	Check for Hard spot due to excessive heat exposure or other reason.		Non replaceable /Non-repairable	
7	Cuts	Check for cuts Caused by wood or Metal planter or other sharp edge		Non replaceable /Non-repairable	
8	Puncture	Check for small hole Caused by wood or Metal planter or other sharp edge		Non replacable /Non-repairable	
		Air Pressure Test: Fill the glove with air & hold against your cheek to feel for & hear releasing air			
9	Contamination	Check for contamination by petroleum product like Diesel,petrol, Grease etc		Cleanings/Washable	
10	Inner cotton Gloves/HRC	Check for Cut, Teared up,contamination by Oil grease etc.		Non replaceable /Non-repairable	
Inspection Result & Remark: If any one point is "NOT OK" then discard the PPE from use unless damaged part replaced					
☐ This PPE can be continued for use		☐ This PPE shall be discontinued from use till damaged part replaced (if possible)		☐ This PPE shall be discarded / discontinued from use	
Inspection done By :				Signature:	
Designation					
Name of HSE person or site Incharge or designated person:				Signature:	

Doc No.: IGESL/HSE/F-18/Rev.05 Annexure No: 4.4 Date: 01.04.2022	HEALTH SAFETY & ENVIRONMMNET PPE's Inspection Checklist	
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Site Name: _____ Department: _____ Date of Inspection _____

Sr. No	Checkpoints	Ok	Not Ok	Remarks
A	Safety Helmet			
	Condition of Helmet			
	Inner Pad /Shell			
	Chin strip			
	Shape			
B	Safety Shoes			
	Hard Toe Condition			
	Soles Condition			
	Shoe less			
	Overall Condition			
C	Full Body Safety Harness			
	Identification No.			
	Lanyard device Condition			
	Harness Webbing Condition			
	D ring & Buckles Condition			
	Hook Safety latch			
	All Stitching Condition			
	Certification & Data tag			
D	Runner			
	Identification/Sr. No			
	Rail wheel condition			
	Rubber wheel condition			
	Hook Safety latch			
	Sliding lock			
	Over all physical condition			

Inspected By _____ Site In charge _____

Doc No.: RESCO/HSE/F-18A/Rev.05 Annexure No: 4.4 Date: 01.04.2022	HEALTH SAFETY & ENVIRONMMNET PPE's Inspection Checklist	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Site Name: _____ Department: _____ Date of Inspection _____

Sr. No	Checkpoints	Ok	Not Ok	Remarks
A	Safety Helmet			
	Condition of Helmet			
	Inner Pad /Shell			
	Chin strip			
	Shape			
B	Safety Shoes			
	Hard Toe Condition			
	Soles Condition			
	Shoe less			
	Overall Condition			
C	Full Body Safety Harness			
	Identification No.			
	Lanyard device Condition			
	Harness Webbing Condition			
	D ring & Buckles Condition			
	Hook Safety latch			
	All Stitching Condition			
	Certification & Data tag			
D	Runner			
	Identification/Sr. No			
	Rail wheel condition			
	Rubber wheel condition			
	Hook Safety latch			
	Sliding lock			
	Over all physical condition			

Inspected By _____

Site In charge _____

Doc. No. IGESL/HSE/F-19/ Rev.05 Annexure 4.5 Date: 01.04.2022		PHYSICAL INSPECTION OF SAFETY BELT		INOXGreen ENERGY SERVICES LIMITED	
BU Name :		Document No:			
Name of User /Employee :		Issued Date:			
Manufacturer Serial Number of PPE		Revision No. :			
Name/ Location of site :		Revision Date:			
Date of Inspection :					
Sr. No.	Parameters / Description	PPE image	What to check	Status (OK / NOT)	Remark
1	Standard/ Specifications		Check IS / CE /EN Mark & number EN 361, EN 358, IS 3521		Not Negotiable
2	Harness Condition				
2.1	Straps		Check all straps for abrasion, damage		Non replaceable /Non-repairable
2.2	Grease or oil contamination		Check Harness straps are oil & grease free		
2.3	Webbings		Check Webbings are free of frayed (threads not came out /stitches not damaged)		
2.4	Change on harness straps due to heat		Check that harness straps are not hard or their shape is not changed due to effect of heat		
2.5	Service life of Harness		Check service life of safety harness as printed on harness for its validity period		
3	Dorsal Anchorage point				
3.1	Abrasion		Check for abrasion of anchorage point		Non replaceable /Non-repairable
3.2	Corrosion		Check for corrosion of anchorage point		
3.3	Crack or damage		Check for Crack or damage due to handling		
4	Buckle Attachment				
4.1	Damage due to abrasion		Check for abrasion of Buckle Attachment		Non replaceable /Non-repairable
4	Crack		Check for Crack on buckles		
2	Working of buckle		Buckle is working smoothly		
5	Karabiner				
5.1	Gate		Check Self closing of gate is working fine		Replaceable
5.2	Nut locks		Check Nut locks are not jam or loose		Replaceable
6	Shock Energy Absorber				
6.1	Absorber activation		Check it is not activated in free fall		Replaceable
6.2	Webbings		Check Webbings are free of frayed (threads not came out / stiches not		Replaceable
7	Lanyard Condition				
7.1	Webbings		Check Webbings are free of frayed (threads not came out / stitches not		Replaceable
7.2	Attachment to Back plate		Check latch/ancorage of "D"ring is working smoothly		Replaceable
			Check latch of snap hook is working		
Inspection Result & Remark: If any one point is "NOT OK" then discard the PPE from use unless damaged part replaced					
This PPE can be continued for Use		☐	This PPE shall be discontinued from use till damaged part replaced (if possible)		This PPE shall be discarded / ☐ discontinued from use
Inspected By:		Signature:			
Designation		Signature:			
Name of HSE person or site in charge or designated person		Signature:			

Doc. No. RESCO/HSE/F-19A/ Rev.05 Annexure 4.5 Date: 01.04.2022		PHYSICAL INSPECTION OF SAFETY BELT		RESCO GLOBAL WIND SERVICES PVT. LTD.	
BU Name :		Document No:			
Name of User /Employee :		Issued Date:			
Manufacturer Serial Number of PPE		Revision No. :			
Name/ Location of site :		Revision Date:			
Date of Inspection :					
Sr. No.	Parameters / Description	PPE image 图	What to check	Status (OK / NOT)	Remark
1	Standard/ Specifications		Check ISI / CE /EN Mark & number EN 361, EN 358, IS 3521		Not Negotiable
2	Harness Condition				
2.1	Straps		Check all straps for abrasion, damage		Non replaceable /Non-repairable
2.2	Grease or oil contamination		Check Harness straps are oil & grease free		
2.3	Webbings		Check Webbings are free of frayed (threads not came out / stitches not damaged)		
2.4	Change on harness straps due to heat		Check that harness straps are not hard or their shape is not changed due to effect of heat		
2.5	Service life of Harness		Check service life of safety harness as printed on harness for its validity period		
3	Dorsal Anchorage point				
3.1	Abrasion		Check for abrasion of anchorage point		Non replaceable /Non-repairable
3.2	Corrosion		Check for corrosion of anchorage point		
3.3	Crack or damage		Check for Crack or damage due to handling		
4	Buckle Attachment				
4.1	Damage due to abrasion		Check for abrasion of Buckle Attachment		Non replaceable /Non-repairable
4	Crack		Check for Crack on buckles		
2	Working of buckle		Buckle is working smoothly		
5	Karabiner				
5.1	Gate		Check Self closing of gate is working fine		Replaceable
5.2	Nut locks		Check Nut locks are not jam or loose		Replaceable
6	Shock Energy Absorber				
6.1	Absorber activation		Check it is not activated in free fall		Replaceable
6.2	Webbings		Check Webbings are free of frayed (threads not came out / stiches not		Replaceable
7	Lanyard Condition				
7.1	Webbings		Check Webbings are free of frayed (threads not came out / stitches not		Replaceable
7.2	Attachment to Back plate		Check latch/ancorage of "D"ring is working smoothly		Replaceable
			Check latch of snap hook is working		
Inspection Result & Remark: If any one point is "NOT OK" then discard the PPE from use unless damaged part replaced					
This PPE can be continued for Use		☐ This PPE shall be discontinued from use till damaged part replaced (if possible)		☐ This PPE shall be discarded / discontinued from use	
Inspected By:		Signature:			
Designation		Signature:			
Name of HSE person or site in charge or designated person		Signature:			

SUMMERISED SAFETY BELT CHECK LIST

Sr. No	Belt Sr. No.	Lanyard Condition	Harness Webbing Condition	Hook Safety Latch	D Ring & Buckles Condition	All Stitching Condition	Certification & Data Tag	Overall Physical Condition	OK	Not OK/ Rejected	Remarks
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Date of Inspection: ____/____/____

1. Inspected By : _____

2. Inspected By : _____

3. Inspected By: _____

Doc. No. RESCO/HSE/F-20A/Rev.05 Annexure:4.6A Date: 01.04.2022				SUMMERISED SAFETY BELT CHECK LIST					RESCO GLOBAL WIND SERVICES PVT. LTD.		
Sr. No	Belt Sr. No.	Lanyard Condition	Harness Webbing Condition	Hook Safety Latch	D Ring & Buckles Condition	All Stitching Condition	Certification & Data Tag	Overall Physical Condition	OK	Not OK/ Rejected	Remarks
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Date of Inspection: ____/____/____

- 1. Inspected By : _____
- 2. Inspected By : _____
- 3. Inspected By: _____

Doc. No. IGESL/HSE/F-21/ Rev.05 Annexure: 4.7 Date: 01.04.2022			SUMMERISED RUNNER/FALL ARRESTER CHECK LIST							
Sr. No.	Runner Sr. No.	Rail Wheel condition	Rubber Wheel condition	Hook Safety Latch	Buckles Condition	Certification Tag	Overall Physical Condition	OK	Not OK/ Rejected	Remarks
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Date of Inspection :
 ____/____/____

1. Inspected By :-----

2. Inspected By :-----

3. Inspected By :-----

Doc. No. RESCO/HSE/F-21A/ Rev.05 Annexure: 4.7 Date: 01.04.2022			SUMMERISED RUNNER/FALL ARRESTER CHECK LIST						RESCO GLOBAL WIND SERVICES PVT. LTD.	
Sr. No.	Runner Sr. No.	Rail Wheel condition	Rubber Wheel condition	Hook Safety Latch	Buckles Condition	Certification Tag	Overall Physical Condition	OK	Not OK/ Rejected	Remarks
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Date of Inspection :
 ____/____/____

1. Inspected By :-----

2. Inspected By :-----

3. Inspected By :-----

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	SAFE WORK PRACTICES (PERMIT TO WORK-PTW)	Guideline No IGESL SITE/HSE/005
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1. OBJECTIVE:

A Work permit system is used to ensure safe working by eliminating possible associated high risks such as excavation, working at height, hot works(welding, gas cutting),confined space, working isolated areas electrical shock, blasting, chemical exposure, fire hazard during the process of work.

2. GUIDELINES:

Safe work Permit is required to be obtained for the following works:

- a. Hot work (welding and gas cutting operations) where the risk of fire is involved
- b. Shutdown of line/GSS/USS/ Maintenance on WTG /Project installation work
- c. Electrical work
- d. Confined space
- e. Excavation
- f. Height work (for the works above 2mts height or climbing of WTG Tower)
- g. Power & Hand tool operation
- h. Blasting
- i. Job in isolated areas where high risk is prevailed
- j. Any other hazardous work / any place where hazardous environment is likely

The work permit is applicable for all employees of IGESL/ RESCO, contractors & sub-Contractors involved in all above described work

- k. Permit to work (PTW) should be obtained before starting of the activity by the designated issuing authority of the Project / site after inspection and ensuring recommended safety measures given by HSE Coordinators.

3. GENERAL SAFETY RULES:

- a. Do not begin the work for which a PTW is required in the site without a completed and authorized work permit. In addition to PTW during normal working hrs, all the works performed after normal working hrs and on holiday require a separate night / holiday work permit & the same have to be signed by the working agency & concerned line manager & safety officer and authorized by the site in charge.
- b. The construction, O&M site shall be considered a restricted area and unauthorized entry into the site is strictly prohibited. Anyone found trespassing shall be asked to leave the site immediately.
- c. Photography shall be strictly prohibited unless express approval of site in-charge.
- d. Smoking, the use of fires (naked flame or open fires) and the use of spark producing equipment or tools are strictly prohibited except in approved areas of the site with valid work permit. No drugs, narcotics, alcoholic drinks are allowed at site also the personnel under influence of the above shall not be allowed at site. To be in possession of, or under the influence of drugs or alcohol is strictly forbidden.
- e. It is the employee's responsibility to conduct him/her in a manner that enables them to maintain a safe work environment for themselves and their fellow worker.
- f. Every effort must be made by the employee to keep the job sites clear of scrap material and other hazards.
- g. All employees should be aware of first-aid box locations and the names of employees holding valid certificates.
- h. The Company reserves the right to take disciplinary action when an employee refuses to abide by any safety rule/policy/cardinal rules/procedure. The disciplinary action may go as far as dismissal.

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- i. Horseplay of any degree is not permitted and will not be tolerated. There is to be no fighting with or threatening of fellow employees.
- j. Each employee should be familiar with the Emergency exits and Fire Extinguisher in the work area.
- k. All safety hazards observed are to be corrected or immediately reported to your supervisor including any defects or damage to machinery, machine parts, equipment or tools.

4. ROLE / RESPONSIBILITIES / ACCOUNTABILITY OF KEY MEMBERS:

a. Issuing Authority:

The site in-charge, in whose jurisdiction, the job is to be carried out, He and safety in charge jointly nominate the issuing authority for permit and display their (Permit issuer) name at notice board. He shall ensure & verify all safety requirements in work permit format and other precautionary measures if required and sign in the permit and also nominate the work coordinator from his side for supervising entire duration of work.

b. Work coordinator / supervisor:

He is the person nominated by Area In-charge to coordinate with executing department during the course of entire work / activity to be carried out. He should monitor the activity till completion of work & ensure area clearance at end of day.

c. Executing authority (Permit receiver):

The job executer, who is in charge of the job, is the permit receiver. (The receiver should be employee of the organization and at least of the supervisory cadre. Permit should not be issued in the name of contractor or his supervisor.) He should evaluate the activity to be carried out, need for work permit, hazards involved etc. He should ensure that all required safety precautions are taken.

d. Executing supervisor:

He is the person nominated by work executing authority to carry out the work /activity as per requirements & complying to all safety requirements. He should also ensure area clearance at the end of the day daily till work is completed.

e. Safety officer:

The safety officer shall cross check & verify the safety requirement in Initial /Intermediate / final stage and approved the work permit for execute the work (All the activities are carried out in compliance to safety requirement and all required safety precaution & arrangement are fulfilled).

f. Security officer:

The security officer is responsible for permitting external person to enter on memo, mail (or in case of emergency / night shift over telephone / SMS exchanged between responsible officer / authority / in-charge and final instruction given by security head or senior security officer).

g. Contractor supervisor:

Person nominated by the contractual agency to supervise the work to be carried out. He should understand the nature of work, hazard involved & precaution required & the same should be instructed to his team members. He should take safety oath with his team members before starting the activity.

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h. Permit Validity:

The validity of the work permit shall be for a shift i.e. 8 Hrs. only. Beyond this, the PTW has to be extended or re issue of permit required.

i. Permit Closure:

On return of permit to issued department, the permit cycle closes for the job. And on disposal of used permit forms; the permit closes in all respect, i.e. Absolute closure of permit.

j. Withdrawal of permit:

The issuing authority may withdraw the permit in the following cases (i) sudden change in the job (ii) decision change (iii) emergency situation

k. Cancellation / Termination:

The permit can be cancelled or terminated if the issuer reviews again the necessity of the work or the adequacy of the arrangements for carrying out the work and finds them inadequate. Such situation could arise when the decision is made to cancel/ terminate the job after the issue of the permit and before starting of the work. This is also possible in case of an emergency situation.

l. Permit Suspension:

The permit issuing authorities / safety representative is authorized to suspend the permit on observance of non-compliance of the permit terms or emergency situation.

m. Permit Extension:

If the work is going to extend & complete within 1.30 hours after the validity time the same can be extended by executing supervisor with prior information to issuing authority, safety officer over phone and put the information & timing in the work permit format.

The executing supervisor should ensure his presence in the work area up to work completion.
(Such extension should be avoided if possible. The jobs which require permit shall be preferably planned in the day shift only because all resources and seniors are available during that time.)

Note: Routine work permit (PTW- Ref: Annexure 5.8) which have triplicate in different three colors;

PINK- Permit holder copy (Which has to carry by team at working location)

YELLOW: Open permit (Shall placed in GSS/CMS/SECTION or office) till permit not closed.

WHITE: Fixed in booklet for record.

AFTER COMPLETION OF WORK, PINK & YELLOW PERMIT TO BE FILED TOGETHER AND KEEP IN CLOSED PERMITS FILE.

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5. PROCEDURAL STEPS FOR FILLING WORK PERMIT SYSTEM: (REFER FLOW DIAGRAM AND WORK PERMIT FORMAT:

- a. Define whether work or activity to be carried out by internal person or external person, If activity to be carried out by external person then intimate security to allow external person to enter through memo or mail.(or in case of emergency / night shift over telephone / SMS exchange through responsible officer / authority / in-charge).
- b. Execute department shall evaluate the work or activity to be carried out and ensure a proper analysis of the work place hazards and risks involved and the necessary safety measures required, proper pre-planning and preparation of the work activity (tasks to be performed / allocation of tasks / tools and materials required or any work place safety measure) as far as possible.
- c. Executing department will be responsible for ensuring that permits are taken **without fail** for all tasks involving hazards (hot works / height work / confined space / excavation/ electrical work/ any other hazardous work / any place where hazardous environment is likely / any combination of the above or other activities which could be hazardous or pose hazard).
- d. Evaluate requirement of work permit. If work permit not required, work to be started under supervision. If work permit required, then Executing department fill the work permit.
- e. Executing department obtain Work permit form – set of 2 copies (with unique serial no.) from security and fill details of area Location, Time period for which permit required ,Description of work, Expected Hazards ,Type of work permit required ,Name of contractor and contractor supervisor in case work is done by external person ,Precautions to be carried out before starting the work, Personal protective Equipment to be used ,and any other safety precautions required.
- f. Write name & obtain signature of work executing authority and nominated executing supervisor (self or nominated person, if different).
- g. In case work to be done by outside / contractual agency, inform Contract Supervisor about nature of work and hazards involved and give his name & sign Write name of persons to be involved in work (Contractual persons and own employees).
- h. Then Seek permission through work permit from Area In-charge where work is to be carried out.
- i. Area In-charge checks details of work permit and give permission, if acceptable & Assign work co-coordinator / supervisor for the entire duration of the work. If the work permit is not approved or need to be reviewed, the same is communicated to executing authority to cancel the work permit / fulfil the requirement in work permit. The cancelled work permit to be submitted to Security (both copies).
- j. After getting clearance to carry out the work from Area In-charge, Executing department seeks approval of safety department through work permit. Safety department cross checks & verifies the work permit, ensure that all required safety precautions and arrangements are understood, planned and properly arranged as identified in the work permit format, such as isolation, barricading, scaffolding, fire fighting arrangements, PPEs (Helmet / Safety shoes / Safety Eyewear / Mask / Goggles / Safety Belt or harness / shock absorbing lanyards / work positioning belt, etc.), etc. If there is any deficiency, it is communicated to executing authority to fulfil the requirements. After verifying the adequacy of arrangements, the Safety department approves the permit.
- k. Activity is to be carried out under supervision of executing supervisor/ contractor in coordination with assigned work coordinator / supervisor of issuing department contract supervisor / executing supervisor / officer shall always keep safety work permit while working.
- l. In case the work is going to extend and get completed within 1-1/2 hours after the validity time, the executing supervisor shall intimate give prior information to issuing authority, safety officer over phone

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- or in person, obtain their permission and put the information and timing in the work permit. In such cases, the executing supervisor should ensure his presence in the work area up to work completion.
- m. At the end of day / completion of work, Coordinator / supervisor (issuing dept) & Executing supervisor shall check the activity (viz.. the entire activity is safely completed and all the systems have been Restored to their normal operating conditions and all the tools and materials and manpower are taken out/ withdrawn) & sign in of work permit copy of executing dept.
 - n. If work is completed, Executing department should inform to area In-charge & submit the completed work permit to security department for final closure of work permit and filing.
 - o. If work / activity not completed and required to be continued on next day.

NOTE:

Any construction/ O&M dept. wants work permit either after 6:00 PM or after complete their shift schedule due to any breakdown failure involving hazardous activities such as hot work or working at heights, then concerned shift supervisor should get the concurrence from his top authority personnel and maintenance / concerned personnel over phone and fill the work permit format, take all precaution, and get the work executed. On next working day, he must obtain signatures of concerned higher authority and submit the completed / closed work permit. In this situation, he will be acting as an issuing, executing & safety representative during the execution stage.

6. HOT WORK (CUTTING/WELDING):

- a. Common hazard involved in welding / cutting are sparks, molten metal, flying objects, harmful light rays, electrical shock etc. Hot work includes Welding, Gas Cutting Burning, Grinding, Soldering, Sand Blasting, Chipping, Riveting, Drilling, Power Tools, and Open Flames etc.
- b. A suitable fire extinguisher shall be made available/installed in work area. Fire Blanket also ready available at work location.
- c. A running water hose and responsible standby person is mandatory for carrying out work in hazardous zone or in proximity of operating areas.
- d. All the adjoining drains / trenches should be cleaned / free from any combustible matter and should be covered suitably.
- e. Adequate measures for containment of spark produced should be taken before starting of hot work.
- f. Proper PPEs should be worn as per the requirement of specific job.
- g. Ensure that only approved and well-maintained apparatus, such as torches, manifolds, regulators, pressure indicators and pressure regulating valves and Acetylene generators are used for gas cutting.
- h. Return earthing / ground cable should be provided directly to the equipment / work piece being welded and both the ground and welding cables should be intact and not cracked or worn out or with joints. The connection should not be established indirectly through pipelines / structures / equipments etc. Proper earthing of the welding machine itself should be ensured. The connection of the welding cable with the output pole of the welding machine should be done with proper fittings.
- i. The welding receptacles shall be rated for 63A suitable for 415 V, 3-phase system with a scraping earth. Receptacles shall have necessary mechanical interlocks and earthing facility.
- j. An energized electrode should never be left unattended and the power source shall be turned off at the end of job.

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- k. All gas cylinders shall be properly secured in upright position and acetylene cylinders shall be turned and kept in such a way that the valve outlet points away from oxygen cylinder and vice-versa. Storage of cylinder (either full or empty) shall be done at cool, dry place under shed. Filled and empty cylinders should be stored separately; Acetylene and Oxygen cylinder should be stored separately.
- l. Lighted gas torch should also never be left unattended. Also cylinder should be kept well away from heat sources.
- m. Flash back arrester shall be provided on the oxygen and acetylene cylinder as an additional precaution.
- n. Cylinders should be transported on trolleys and should never be dragged. All cylinders should be checked for leakage, colour coding and valve cap before accepting. No cylinder should be accepted without proper color coding and valve cap.
- o. Hoses of the cutting torch should be properly colored (red for acetylene and black for oxygen) and of same length. The lighting of the torch shall be done by friction lighter instead of match box. Hoses shall be checked for leakage before use. Also the hoses should not be dragged.
- p. Periodic Inspection tag and Equipment S. No. should be available.

7. CONFINED SPACE ENTRY:

- a. Ensure proper and accessible means of exit before entry inside a confined space.
- b. Entry inside the confined space to carry out any job should be done after issuance of valid permit only.
- c. The number of persons allowed inside the vessel should be limited.
- d. At least one person shall invariably act as standby at nearby exit / man way.
- e. Before entering inside vessels underground or located at lower elevation, probability of dense vapours accumulating nearby should also be considered in addition to inside of vessel.
- f. Ensure that O₂ level shall be above 19.5% and not more than 23.5% level by volume in air. Also simultaneously it should be ensured that no Hydrocarbon or toxic substances are present or are below permissible levels before entry and the checks should be continued periodically during course of the vessel entry. Otherwise use of online air respirators / SCBA (Self-contained breathing apparatus) with other personal protective equipment should be considered.
- g. Barricading of the confined space should be considered during hoisting, radiography, blasting, pressure testing etc.
- h. Only use of 24 V DC flameproof lamp fittings should be used for illumination inside confined spaces irrespective of the fact that all requisite checks and gas freeing have been carried out.
- i. Preferably compressed air driven tools should be used while working in confined spaces or 24DC electrically driven tools should be considered instead.
- j. Minimum PPEs, Safety Helmet, Safety Shoes and Safety belt with a guy line shall be worn by every person entering confined space.
- k. In case of hot work going on the welding electrode holder / gas cutting torches should be kept outside of the confined space immediately after completing the job. Cylinders should also be kept outside of confined space.
- l. All cables, hoses, welding equipment etc. shall be removed from confined space at the end of each work day, even if the work is to be resumed in the same space next day.
- m. To the extent possible sludge shall be cleared and removed from outside before entering.
- n. No naked light or flame or hot work such as welding, cutting and soldering should be permitted inside a confined space or area unless it has been made completely free of the flammable atmosphere, tested

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and found safe by a competent person and a permit to that effect must have been obtained prior to starting of work.

- o.** Communication should be always maintained between the worker and the person standby.
- p.** Entry or Work inside confined space shall be allowed after safety permit.
- q.** Log book for employee entry & exit should be available at standby person.
- r.** Permit and appropriate signs displayed at working location.
- s.** Who are working in side they have must carry the Oxygen level meter at all times.

8. EXCAVATION AND BACKFILLING:

All excavation work should be planned and the method of excavation and the type of support work required shall be decided considering the following.

- a.** The stability of the ground;
- b.** The excavation will not affect adjoining buildings, structures, roadways;
- c.** To prevent hazard, the gas, water, electrical and other public utilities should be shut off or disconnected if necessary.
- d.** Presence of underground pipes, cables conductors etc.
- e.** The position of culvert / bridges, temporary roads and spoil heaps should be determined.
- f.** Before digging at the site, all excavation work should be planned and the method of excavation and the type of support work required decided.
- g.** Wherever there is a possibility of any ingress of water, then pumping shall be established with pumps being readily available for use and additional ladders placed for use, in the event of the emergency evacuation.
- h.** All excavation work must be supervised.
- i.** Sites of excavation should be thoroughly inspected:
- j.** Daily, prior to each shift and after interruption in work of more than one day;
- k.** After every blasting operation;
- l.** After an unexpected fall of ground;
- m.** After substantial damage to supports;
- n.** After a heavy rain, frost or snow;
- o.** Safe angle of repose of particular type of soil while excavating trenches exceeding 1.5m (5') depth up to 3.0m should be maintained. Based on site condition, proper sloping should be provided corresponding to the angle of repose of the soil (usually 45 deg), and suitable bench of 0.5m width at every depth of 1.5m of excavation in all soils except hard rock. Otherwise proper shoring and strutting to prevent cave-in or slides.
- p.** Don't allow vehicles to operate too close to excavated area. Maintain at least 2m distance from edge of excavation. No load, plant or equipment should be placed or moved near to the edge of excavation where it is likely to cause collapse and thereby endanger any person unless precautions such as the provision of shoring or piling are taken to prevent the sides from collapsing.
- q.** Adequately anchored stop blocks and barriers should be provided to prevent vehicles being driven into the excavation. Heavy vehicles should not be allowed near the excavation unless the support work has been especially designed to permit it.
- r.** Barricade of 1m height (with red and white band / self-glowing caution board) should be provided for excavations beyond 1.5m depth. Provide two entries / exits for such excavation.

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- s. Necessary precautions should be taken for underground utility lines like cables, sewers etc. and necessary approvals / clearances from the concerned authorities shall be obtained before commencement of the excavation job.
- t. Water shall be pumped / bailed out, if any accumulates in the trench. Necessary precautions should be taken to prevent entry of surface water in trenches.
- u. Proper approach to be made to pit which is required to be back filled as well as to the source of backfilling materials.
- v. All vehicles engaged in backfilling to be provided with reverse horn.
- w. Before pushing backward any vehicle to the spot of backfilling nearby area to be cleared of workmen.
- x. The point up to which a vehicle could be reversed should be clearly demarcated preferably by lime or other suitable measures.
- y. In case of backfilling in night proper lighting arrangements to be made.
- z. Proper PPEs (dust mask etc.) to be provided to workmen engaged in backfilling.
- aa. The excavation work involving blasting work or wherever possibility of damaging utility services, the work shall be done only after safety permit.

9. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Date: 01.04.2022					
PROJECT/SITE:-			Location:		
Valid Period:					
All work under this permit required a valid clearance certificate					
Requested by:			Date:-		
Staff/Contractor			Time:-		
Equipments to be used:					
For Information:					
Description of the work:					
Inspected by:					
Name:					
Designation:			Date& Time:		
Continuous Monitoring to be carried out:			Yes ()		No ()
Safety Personnel to be in monitor the activity:			Yes ()		No ()
Conditions of use (These must be observed)					
Follow Safety rules compulsory				Yes/No	
1)Fire Extinguisher have placed near to the hot work					
2)Fire Blankets are at hand (if applicable)					
3)Drains in the area to be covered and sanded (if applicable)					
4)Area under/ Around work to be sheeted out to contain sparks					
5)Sheet out scaffold platforms					
6)Keep bit cool					
For Shot Blasting	a. Water Protective Clothing				
	b. Place Caution signs				
	c. Contain Shoot				
	d. Use wet Head only				
Welding Machines are earthed and connected through 30 ma ELCB, all Lug joints to the Machine are tight					
Acetylene /LPG cylinders to be kept upright position and Oxygen Cylinders to be kept horizontal position.(Flash back arresters must)					
Other Conditions if any to be Observed:					
Permit Acceptor Name/Sign.		Permit Issuer (IGESL)		Site HSE Person (IGESL)	

Doc. No. RESCO/HSE/F-22A/Rev.05 Annexure: 5.1		HOT WORK PERMIT		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Date: 01.04.2022					
PROJECT/SITE:-			Location:		
Valid Period:					
All work under this permit required a valid clearance certificate					
Requested by:			Date:-		
Staff/Contractor			Time:-		
Equipments to be used:					
For Information:					
Description of the work:					
Inspected by:					
Name:					
Designation:			Date& Time:		
Continuous Monitoring to be carried out:			Yes ()		No ()
Safety Personnel to be in monitor the activity:			Yes ()		No ()
Conditions of use (These must be observed)					
Follow Safety rules compulsory				Yes/No	
1)Fire Extinguisher have placed near to the hot work					
2)Fire Blankets are at hand (if applicable)					
3)Drains in the area to be covered and sanded (if applicable)					
4)Area under/ Around work to be sheeted out to contain sparks					
5)Sheet out scaffold platforms					
6)Keep bit cool					
For Shot Blasting	a. Water Protective Clothing				
	b. Place Caution signs				
	c. Contain Shoot				
	d. Use wet Head only				
Welding Machines are earthed and connected through 30 ma ELCB, all Lug joints to the Machine are tight					
Acetylene /LPG cylinders to be kept upright position and Oxygen Cylinders to be kept horizontal position.(Flash back arresters must)					
Other Conditions if any to be Observed:					
Permit Acceptor Name/Sign.		Permit Issuer (RESCO)		Site HSE Person (RESCO)	

Doc. No. IGESL/HSE/F-23/Rev.05 Annexure: 5.2 Date: 01.04.2022	HEIGHT WORK PERMIT		INOXGreen ENERGY SERVICES LIMITED
PROJECT / UNIT:-		Location:-	
Valid Period:		Permit No:	
All work under this permit required a valid clearance certificate-			
Requested by:		Date:	
Staff/Contractor		Time:	
Equipments to be used:			
Approximately Height:			
Description of the work:-			
Test Taken by: Name: Designation: _____ Date _____ Time _____			
Safety Personnel to be in attendance at all times:		Yes () No ()	
Name:			
Conditions of use (These must be observed)			
Follow Safety rules compulsory		Yes/No	
1)Compulsory wear Safety Helmets, Safety Shoes & Hand gloves			
2)Compulsory wear Safety full body harness/Safety Belt check before			
3) Work Location Engineer and Supervisor is must			
4)Joined any new worker please intimate to Safety Department			
5) Maintain the House Keeping			
Other condition if any to be Observed			
Acceptor Name & Sign.		Permit Issuer (IGESL) _____ Site HSE Person(IGESL) _____	

Doc. No. RESCO/HSE/F-23/Rev.05 Annexure: 5.2 Date: 01.04.2022	HEIGHT WORK PERMIT		RESCO GLOBAL WIND SERVICES PVT. LTD.
PROJECT / UNIT:-		Location:-	
Valid Period:		Permit No:	
All work under this permit required a valid clearance certificate-			
Requested by:		Date:	
Staff/Contractor		Time:	
Equipments to be used:			
Approximately Height:			
Description of the work:-			
Test Taken by: Name: Designation: _____ Date _____ Time _____			
Safety Personnel to be in attendance at all times:		Yes () No ()	
Name:			
Conditions of use (These must be observed)			
Follow Safety rules compulsory		Yes/No	
1)Compulsory wear Safety Helmets, Safety Shoes & Hand gloves			
2)Compulsory wear Safety full body harness/Safety Belt check before			
3) Work Location Engineer and Supervisor is must			
4)Joined any new worker please intimate to Safety Department			
5) Maintain the House Keeping			
Other condition if any to be Observed			
Acceptor Name & Sign.		Permit Issuer (RESCO) Site HSE Person(RESCO)	

Doc. No. RESCO/HSE/F-24/Rev.05 Annexure: 5.3 Date: 01.04.2022			EXCAVATION WORK PERMIT			RESCO GLOBAL WIND SERVICES PVT.LTD.			
Valid	Date:					Area / Location of the site:			
	Time:	From							
Description of work to be carried out						Equipment / System / Area:			
						Excavation Check – List		Yes	No
						1.	Underground obstruction exist		
						2.	Before excavation check refer Drawings		
						3.	Underground obstruction marked on the ground		
							A) Electrical cables		
							B) Telephone cables		
							C) Oil / Gas & Waterlines		
							D) Sewer		
						4.	Excavation will be carried out in explosion risk area		
						Instruction for the excavation work			
Protective Equipment / Measures :						(A)	Excavation route is inspected and safety precautions listed in this permit must be followed.		
						(B)	Excavation route is inspected and we certify that underground obstructions do not exist.		
						Electrical:			
						Civil:			
						Mechanical:			
						Communicate to :Safety Department			
Area has barricaded, Caution boards & danger lamps placed, I have personally checked the job site conditions for the work is fulfilled.						I acknowledge the precaution to be taken and accept the responsibility of carrying out the job accordingly.			
I have personally checked the job site conditions and confirm that a safe condition for work is fulfilled.						The work is finished, back filling has done & waste material removed.			
Acceptor Name & Sign. (RESCO)			Permit Issuer (RESCO)			Site HSE Person (RESCO)			

Doc. No. IGESL/HSE/F-25/ Rev.05 Annexure: 5.4 Date: 01.04.2022	ELECTRICAL WORK PERMIT	
Description of Work:-		
Permit No: _____		Location: _____
Location : _____		Equip. Name/No: _____
Receiver: _____	Designation: _____	Department: _____
Permit valid From: Date: _____	Time _____	To: Date: _____ Time: _____
S. No Checklist Yes/NA	S. No Checklist Yes/NA	
By Issuer: 1)Area isolated by opening MCCB/ACB/SFU ----- 2)VCB/AB Switch is isolated and locked ----- 3)Concerned fuses were removed ----- 4)All possible back feeding supplies are disconnected ----- 5)Line/ equipment is disconnected, If required ----- 6)Line/equipment is earthed ----- 7)Line/equipment /area barricaded ----- 8)Danger boards/Safety tags displayed ----- 9)Rubber mat provided ----- 10)Capacitors were discharged ----- 11)Electrical Hand Gloves inspected ----- 12)Proper lighting & Ventilation provided ----- 13) Man trained in first aid posted. Name: _____ 14)If electrical works involved are at height, Work at height permit no: _____ 15) Adequate working space and necessary access which is free from danger is provided. -----	By Receiver: a)Following personal protective equipment to be used ----- Helmet() Electrical Gloves 440V/33KV () Fuse Puller() Insulated Safety Shoes() Goggles () Insulated ladder () Scaffolding() Safety Full Body Harness () Clamp/Multi- Meter () Discharge rod() b)Line/Equipment is to be properly earthed ----- c)Portable tools are to be inspected ----- d)Production authorities are to be informed ----- e)Instruction no.4 of overleaf to be complied ----- f)Pep talk to be organized ----- g)Special precautions, if any:	
Specific Risk Assessment if any: Attach separate sheet - Yes() No () Safety Officer		
Voltage : _____ V Capacitors : _____ V Earthing : _____ Ω	Conducted By: Name: _____ E. Code _____ Time: _____ Signature: _____	
We have personally checked and satisfied ourselves that the above particulars are correct and it is safe to carry out the above mentioned work.		
_____ Prepared By	_____ Verified By	_____ Signature of issuer

Doc. No. RESCO/HSE/F-25A/ Rev.05 Annexure: 5.4 Date: 01.04.2022	ELECTRICAL WORK PERMIT	RESCO GLOBAL WIND SERVICES PVT. LTD.
Description of Work:-		
Permit No:		Location:
Location :		Equip. Name/No:
Receiver:	Designation:	Department:
Permit valid From: Date:	Time	To: Date: Time:
S. No	Checklist	Yes/NA
By Issuer: 1)Area isolated by opening MCCB/ACB/SFU ----- 2)VCB/AB Switch is isolated and locked ----- 3)Concerned fuses were removed ----- 4)All possible back feeding supplies are disconnected ----- 5)Line/ equipment is disconnected, If required ----- 6)Line/equipment is earthed ----- 7)Line/equipment /area barricaded ----- 8)Danger boards/Safety tags displayed ----- 9)Rubber mat provided ----- 10)Capacitors were discharged ----- 11)Electrical Hand Gloves inspected ----- 12)Proper lighting & Ventilation provided ----- 13) Man trained in first aid posted. Name: _____ 14)If electrical works involved are at height, Work at height permit no: _____ 15) Adequate working space and necessary access which is free from danger is provided. -----		
S. No	Checklist	Yes/NA
By Receiver: a)Following personal protective equipment to be used ----- Helmet() Electrical Gloves 440V/33KV () Fuse Puller() Insulated Safety Shoes() Goggles () Insulated ladder () Scaffolding() Safety Full Body Harness () Clamp/Multi- Meter () Discharge rod() b)Line/Equipment is to be properly earthed ----- c)Portable tools are to be inspected ----- d)Production authorities are to be informed ----- e)Instruction no.4 of overleaf to be complied ----- f)Pep talk to be organized ----- g)Special precautions, if any:		
Specific Risk Assessment if any: Attach separate sheet - Yes() No () Safety Officer		
Voltage : _____ V Capacitors : _____ V Earthing : _____ Ω	Conducted By: Name: _____ E. Code _____ Time: _____ Signature: _____	
We have personally checked and satisfied ourselves that the above particulars are correct and it is safe to carry out the above mentioned work.		
Prepared By _____	Verified By _____	Signature of issuer _____

Safety Audit Checklist Guide

Date: _____

Fire and Safety Equipment

Yes	No	N/A
☐	☐	☐
☐	☐	☐
☐	☐	☐

- Is the proper fire and safety equipment available?
- Is the equipment accessible (i.e. is it unblocked)?
- Are flammables stored in flammable storage cabinets?

Operation of Machinery or Complex Apparatus

☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐

- Are the indicator lights on the apparatus in an O.K. or safe condition?
- Is the apparatus producing normal sounds, odours, parts, or results?
- Is the apparatus equipped with data recorders or monitors that track the condition of the apparatus?
- If necessary, are there maintenance logs or other records that track the condition of the apparatus?
- Are proper lock/tag techniques being practiced?

Common Tools and Equipment

☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐

- Are the workers using the right tool for the job?
- Are the workers using the tools correctly?
- If necessary, have the workers been trained to use the tools?
- Are the tools in good and safe working condition?
- Have the tools been inspected recently?
- Are the tools stored in appropriate locations?

Work Area and Housekeeping

☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐
☐	☐	☐

- Is the work area neat in appearance?
- Are all aisles and walk-ways sufficiently wide for personnel and moving equipment?
- Do all aisles used by moving equipment have clear line-of-sights?
- Do all walking/working surfaces have barricades or hand guards to protect personnel from hazards?
- Are the chemicals properly inventoried and stored away?
- Is the lighting adequate?
- Are the exits clearly marked and easy to find?
- Are all overhead items secured?
- Are all stairs in good and safe condition?
- Are all ladders properly secured or stored away?
- Is the overall building in good working condition?

General Procedures

☐	☐	☐
☐	☐	☐
☐	☐	☐

- Do the personnel and building occupants know evacuation procedures for fire and weather alarms?
- Do building occupants such as lab visitors have point-of-contacts within the building?
- Is the area manager sufficiently aware of work being done by lab visitors or employees from other areas?

Personnel Ergonomics, Focus, Training, and PPE

	Yes	No	N/A
Are the personnel working in a manner that is free of unnecessary physical exertion?	☐	☐	☐
Are the personnel practicing good ergonomics?	☐	☐	☐
Do the personnel seem sufficiently focused on their job, especially jobs where there are hazards present?	☐	☐	☐
Are the personnel trained to do the job and are aware of the hazards and mitigations?	☐	☐	☐
Does the job appear suited to the personnel?	☐	☐	☐
If necessary, are the personnel using PPE?	☐	☐	☐
For work near machinery, are the personnel wearing proper clothing?	☐	☐	☐
If necessary, are the personnel wearing TLD badges in radiation areas?	☐	☐	☐

Notes

Name of Auditor_____

Signature_____

Safety Audit Checklist Guide

Date: _____

Fire and Safety Equipment

	Yes	No	N/A
Is the proper fire and safety equipment available?	☐	☐	☐
Is the equipment accessible (i.e. is it unblocked)?	☐	☐	☐
Are flammables stored in flammable storage cabinets?	☐	☐	☐

Operation of Machinery or Complex Apparatus

Are the indicator lights on the apparatus in an O.K. or safe condition?	☐	☐	☐
Is the apparatus producing normal sounds, odours, parts, or results?	☐	☐	☐
Is the apparatus equipped with data recorders or monitors that track the condition of the apparatus?	☐	☐	☐
If necessary, are there maintenance logs or other records that track the condition of the apparatus?	☐	☐	☐
Are proper lock/tag techniques being practiced?	☐	☐	☐

Common Tools and Equipment

Are the workers using the right tool for the job?	☐	☐	☐
Are the workers using the tools correctly?	☐	☐	☐
If necessary, have the workers been trained to use the tools?	☐	☐	☐
Are the tools in good and safe working condition?	☐	☐	☐
Have the tools been inspected recently?	☐	☐	☐
Are the tools stored in appropriate locations?	☐	☐	☐

Work Area and Housekeeping

Is the work area neat in appearance?	☐	☐	☐
Are all aisles and walk-ways sufficiently wide for personnel and moving equipment?	☐	☐	☐
Do all aisles used by moving equipment have clear line-of-sights?	☐	☐	☐
Do all walking/working surfaces have barricades or hand guards to protect personnel from hazards?	☐	☐	☐
Are the chemicals properly inventoried and stored away?	☐	☐	☐
Is the lighting adequate?	☐	☐	☐
Are the exits clearly marked and easy to find?	☐	☐	☐
Are all overhead items secured?	☐	☐	☐
Are all stairs in good and safe condition?	☐	☐	☐
Are all ladders properly secured or stored away?	☐	☐	☐
Is the overall building in good working condition?	☐	☐	☐

General Procedures

Do the personnel and building occupants know evacuation procedures for fire and weather alarms?	☐	☐	☐
Do building occupants such as lab visitors have point-of-contacts within the building?	☐	☐	☐
Is the area manager sufficiently aware of work being done by lab visitors or employees from other areas?	☐	☐	☐

Personnel Ergonomics, Focus, Training, and PPE

	Yes	No	N/A
Are the personnel working in a manner that is free of unnecessary physical exertion?	☐	☐	☐
Are the personnel practicing good ergonomics?	☐	☐	☐
Do the personnel seem sufficiently focused on their job, especially jobs where there are hazards present?	☐	☐	☐
Are the personnel trained to do the job and are aware of the hazards and mitigations?	☐	☐	☐
Does the job appear suited to the personnel?	☐	☐	☐
If necessary, are the personnel using PPE?	☐	☐	☐
For work near machinery, are the personnel wearing proper clothing?	☐	☐	☐
If necessary, are the personnel wearing TLD badges in radiation areas?	☐	☐	☐

Notes

Name of Auditor_____

Signature_____

Doc. No. IGESL/HSE/F-27/Rev.05 Annexure – 5.6 Date: 01.04.2022	INOX GREEN ENERGY SERVICES LIMITED CONFINED SPACE WORK PERMIT	
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No.
PERMITEE:

Job Location : _____

Valid: Date : _____ From Time : _____ AM / PM To Time: _____ AM / PM

Job Description: _____

Job carried out by : Own / Contractor **No. of Persons to be involved:** _____

Name of the Contractor: _____

Name of persons: 1) _____ 2) _____ 3) _____
 4) _____ 5) _____ 6) _____
 7) _____ 8) _____ 9) _____

Sr. No.	CONFINED SPACE ENTRY PERMIT for _____	Yes	No	NA
1	Confined space properly emptied.			
2	Confined space made free of Trace Gases / Materials by proper means.			
3	Electrical Isolation done (Disconnecting / Removing Fuse) by Mr. _____ Register Entry (Sr. No. _____ Time _____)			
4	All lines leading to and from vessel are disconnected. Valves are closed and blanked.			
5	Switch brought to " OFF " position, locked and tagged.			
6	Absence of Flammable / Toxic vapors Checked (O ₂ content should be > 19 % by Volume). Ensure Fresh Air supply (compressed Air)			
7	Proper lighting is provided.			
8	Safety belt / ladder are used.			
9	Observer posted outside the manhole with life line			
10	PPE used (please tick whichever applicable) - a) Hand Gloves b) Safety Goggle c) Nose Mask d) Face Shield e) Safety Belts f) Other (Specify)			
11	Additional Safety precautions, (if any) -			

This permit is issued on date ----- from Time ----- AM / PM to ----- AM / PM.		
After inspections of all safety requirements I / we approve this Work Permit.		
Name:	Name:	Name:
Signature	Signature	Signature
Issuing officer	Executing officer	Safety Officer / Shift In-charge

RENEWAL OF PERMIT (SECOND DAY) After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.	I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.
Name:	Name:
Signature	Signature

Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee	
RENEWAL OF PERMIT (THIRD DAY) After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.			I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.	
Name:	Name:	Name:	Name:	
Signature	Signature	Signature	Signature	
Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee	
CLOSURE / CANCELLATION OF PERMIT			Yes	No
1	The job is completed. All personnel withdrawn. Tools used during work are removed from the work place.			
2	Electricity made available by placing fuses / unlocking switches / removing tags.			
3	Work site is cleaned and free of debris and waste.			
4	All flame / spark producing equipment and other auxiliary equipment are removed from location.			
5	Equipment / machine is electrically / mechanically connected, checked and handed over to user department.			
6	All site conditions inspected and found safe.			
7	The permit is CLOSED / CANCELLED .			
Date: _____		Time: _____ AM / PM		
Name: Signature (Officer / Section Head Executing Dept.)		Name: Signature (Officer / Section Head Issuing Dept.)		
Name: Signature (Safety Officer / Shift In-charge)				
PROCEDURE & RECORD KEEPING –				
Two copies shall be prepared for each permit (PERMITEE & ISSUER) –				
1. PERMITEE copy should be with the user and should be available on the site when work is in progress.				
2. ISSUER copy should be retained with issuer for record.				
3. After completion of the job, Permit should be returned to issuing department for record.				
4. Permits to be preserved for One Week from date of completion of the Work.				
INSTRUCTIONS FOR ISSUING WORK PERMIT:				
1. The permit is valid maximum up to 03 days. 2. Any kind of over writing makes the permit invalid (only issuing authority can do corrections to the permit with Name and signature. 3. Presence of any Flammable / Toxic vapours and O ₂ level to be checked and recorded. 4. Permit to be available at work site till closure / cancellation of permit. 5. “CAUTION: MAINTENANCE IN PROGRESS” to be displayed at work site till closure / cancellation of work permit. 6. The permit does not relieve the user of his responsibility with respect to SAFETY. 7. In case of fire, uncertain situation or sounding of fire /emergency siren, stop the work and proceed to the assembly point. 8. If more than one agency is required to work on the same equipment, each agency should put individual electrical isolation tag on the electrical isolation panel. 9. The period of validity of permit must be strictly observed. Any extension of period should be endorsed. 10. User of Permit should not make any utility connection on his own. 11. After completion of work or at the end of the shift, user must return the work permit to the issuing department. 12. The person working must be experienced in the job he is doing. 13. Issuing department should check all parameters as stated in Work Permit. 14. Vessel / Storage Tank / Ball Mill / etc. under repairing or cleaning to be displayed on display board or to be entered in log book. 15. Fuses removed to be tagged and Equipment Nos. to be clearly mentioned on the tag by electrical personnel.				

Doc. No. IGESL/HSE/F-27/Rev.05 Annexure – 5.6 Date: 01.04.2022	INOX GREEN ENERGY SERVICES LIMITED CONFINED SPACE WORK PERMIT	INOXGreen ENERGY SERVICES LIMITED
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Job Location : _____

Valid: Date - _____ From Time - _____ AM / PM To Time - _____ AM / PM

No. _____

ISSUER: _____

Job Description: _____

Job carried out by : Own / Contractor No. of Persons to be involved: _____

Name of the Contractor: _____

Name of persons: 1) _____ 2) _____ 3) _____
4) _____ 5) _____ 6) _____
7) _____ 8) _____ 9) _____

Sr. No.	CONFINED SPACE ENTRY PERMIT (Vessel / Storage Tank / Ball Mill / Other)	Yes	No	NA
1	Vessel properly emptied.			
2	Vessel made free of Trace Gases / Materials by proper means.			
3	Electrical Isolation done (Disconnecting / Removing Fuse) by Mr. _____ Register Entry (Sr. No. _____ Time _____)			
4	All lines leading to and from vessel are disconnected. Valves are closed and blanked.			
5	Switch brought to "OFF" position, locked and tagged.			
6	Absence of Flammable / Toxic vapours Checked (O ₂ content should be > 19 % by Volume). Ensure Fresh Air supply (compressed Air)			
7	Proper lighting is provided.			
8	Safety belt / ladder are used.			
9	Observer posted outside the manhole with life line			
10	PPE used (please tick whichever applicable) - a) Hand Gloves b) Safety Goggle c) Nose Mask d) Face Shield e) Safety Belts f) Other (Specify)			
11	Additional Safety precautions, (if any) -			

This permit is issued on date ----- from Time ----- AM / PM to ----- AM / PM.

After inspections of all safety requirements I / we approve this Work Permit.

Name:	Name:	Name:
Signature	Signature	Signature
Issuing officer	Executing officer	Safety Officer / Shift In-charge

RENEWAL OF PERMIT (SECOND DAY) After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.			I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.
Name:	Name:	Name:	Name:
Signature	Signature	Signature	Signature

Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee		
<u>RENEWAL OF PERMIT (THIRD DAY)</u> After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.			I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.		
Name:	Name:	Name:	Name:		
Signature	Signature	Signature	Signature		
Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee		
CLOSURE / CANCELLATION OF PERMIT			Yes	No	NA
1	The job is completed. All personnel withdrawn. Tools used during work are removed from the work place.				
2	Electricity made available by placing fuses / unlocking switches / removing tags.				
3	Work site is cleaned and free of debris and waste.				
4	All flame / spark producing equipment and other auxiliary equipment are removed from location.				
5	Equipment / machine is electrically / mechanically connected, checked and handed over to user department.				
6	All site conditions inspected and found safe.				
7	The permit is CLOSED / CANCELLED .				
Date: _____			Time: _____ AM / PM		
Name: Signature (Officer / Section Head Executing Dept.)		Name: Signature (Officer / Section Head Issuing Dept.)	Name: Signature (Safety Officer / Shift In-charge)		
<u>PROCEDURE & RECORD KEEPING –</u>					
Two copies shall be prepared for each permit (PERMITEE & ISSUER) –					
1. PERMITEE copy should be with the user and should be available on the site when work is in progress.					
2. ISSUER copy should be retained with issuer for record.					
3. After completion of the job, Permit should be returned to issuing department for record.					
4. Permits to be preserved for One Week from date of completion of the Work.					
INSTRUCTIONS FOR ISSUING WORK PERMIT:					
1. The permit is valid maximum up to 03 days. 2. Any kind of over writing makes the permit invalid (only issuing authority can do corrections to the permit with Name and signature. 3. Presence of any Flammable / Toxic vapours and O ₂ level to be checked and recorded. 4. Permit to be available at work site till closure / cancellation of permit. 5. “CAUTION: MAINTENACE IN PROGRESS” to be displayed at work site till closure / cancellation of work permit. 6. The permit does not relieve the user of his responsibility with respect to SAFETY. 7. In case of fire, uncertain situation or sounding of fire /emergency siren, stop the work and proceed to the assembly point. 8. If more than one agency is required to work on the same equipment, each agency should put individual electrical isolation tag on the electrical isolation panel. 9. The period of validity of permit must be strictly observed. Any extension of period should be endorsed. 10. User of Permit should not make any utility connection on his own. 11. After completion of work or at the end of the shift, user must return the work permit to the issuing department. 12. The person working must be experienced in the job he is doing. 13. Issuing department should check all parameters as stated in Work Permit. 14. Vessel / Storage Tank / Ball Mill / etc. under repairing or cleaning to be displayed on display board or to be entered in log book. 15. Fuses removed to be tagged and Equipment Nos. to be clearly mentioned on the tag by electrical personnel.					

Doc. No. RESCO/HSE/F-27A/Rev.05 Annexure – 5.6 Date: 01.04.2022	CONFINED SPACE WORK PERMIT	RESCO GLOBAL WIND SERVICES PVT. LTD.
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No.

PERMITEE:

Job Location : _____

Valid: Date : _____ From Time : _____ AM / PM To Time: _____ AM / PM

Job Description: _____

Job carried out by : Own / Contractor No. of Persons to be involved: _____

Name of the Contractor: _____

Name of persons:

- | | | |
|----------|----------|----------|
| 1) _____ | 2) _____ | 3) _____ |
| 4) _____ | 5) _____ | 6) _____ |
| 7) _____ | 8) _____ | 9) _____ |

Sr. No.	CONFINED SPACE ENTRY PERMIT for _____	Yes	No	NA
1	Confined space properly emptied.			
2	Confined space made free of Trace Gases / Materials by proper means.			
3	Electrical Isolation done (Disconnecting / Removing Fuse) by Mr. _____ Register Entry (Sr. No. _____ Time _____)			
4	All lines leading to and from vessel are disconnected. Valves are closed and blanked.			
5	Switch brought to "OFF" position, locked and tagged.			
6	Absence of Flammable / Toxic vapors Checked (O ₂ content should be > 19 % by Volume). Ensure Fresh Air supply (compressed Air)			
7	Proper lighting is provided.			
8	Safety belt / ladder are used.			
9	Observer posted outside the manhole with life line			
10	PPE used (please tick whichever applicable) - a) Hand Gloves b) Safety Goggle c) Nose Mask d) Face Shield e) Safety Belts f) Other (Specify)			
11	Additional Safety precautions, (if any) -			

This permit is issued on date ----- from Time ----- AM / PM to ----- AM / PM.

After inspections of all safety requirements I / we approve this Work Permit.

Name:	Name:	Name:
Signature	Signature	Signature
Issuing officer	Executing officer	Safety Officer / Shift In-charge

RENEWAL OF PERMIT (SECOND DAY)

After re-inspections of all safety requirements I / we renew this Work Permit.

Date _____ from Time _____ AM / PM to _____ AM / PM.

Name:	Name:	Name:
Signature	Signature	Signature

I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.

Issuing officer charge	Executing officer	Safety Officer / Shift In-charge	Permittee	
RENEWAL OF PERMIT (THIRD DAY) After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.			I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.	
Name:	Name:	Name:	Name:	
Signature	Signature	Signature	Signature	
Issuing officer charge	Executing officer	Safety Officer / Shift In-charge	Permittee	
CLOSURE / CANCELLATION OF PERMIT			Yes	No
1	The job is completed. All personnel withdrawn. Tools used during work are removed from the work place.			
2	Electricity made available by placing fuses / unlocking switches / removing tags.			
3	Work site is cleaned and free of debris and waste.			
4	All flame / spark producing equipment and other auxiliary equipment are removed from location.			
5	Equipment / machine is electrically / mechanically connected, checked and handed over to user department.			
6	All site conditions inspected and found safe.			
7	The permit is CLOSED / CANCELLED .			
Date: _____			Time: _____ AM / PM	
Name: Signature (Officer / Section Head Executing Dept.)		Name: Signature (Officer / Section Head Issuing Dept.)		Name: Signature (Safety Officer / Shift In-charge)
PROCEDURE & RECORD KEEPING –				
Two copies shall be prepared for each permit (PERMITEE & ISSUER) –				
1. PERMITEE copy should be with the user and should be available on the site when work is in progress.				
2. ISSUER copy should be retained with issuer for record.				
3. After completion of the job, Permit should be returned to issuing department for record.				
4. Permits to be preserved for One Week from date of completion of the Work.				
INSTRUCTIONS FOR ISSUING WORK PERMIT:				
16. The permit is valid maximum up to 03 days. 17. Any kind of over writing makes the permit invalid (only issuing authority can do corrections to the permit with Name and signature. 18. Presence of any Flammable / Toxic vapours and O ₂ level to be checked and recorded. 19. Permit to be available at work site till closure / cancellation of permit. 20. “CAUTION: MAINTENANCE IN PROGRESS” to be displayed at work site till closure / cancellation of work permit. 21. The permit does not relieve the user of his responsibility with respect to SAFETY. 22. In case of fire, uncertain situation or sounding of fire /emergency siren, stop the work and proceed to the assembly point. 23. If more than one agency is required to work on the same equipment, each agency should put individual electrical isolation tag on the electrical isolation panel. 24. The period of validity of permit must be strictly observed. Any extension of period should be endorsed. 25. User of Permit should not make any utility connection on his own. 26. After completion of work or at the end of the shift, user must return the work permit to the issuing department. 27. The person working must be experienced in the job he is doing. 28. Issuing department should check all parameters as stated in Work Permit. 29. Vessel / Storage Tank / Ball Mill / etc. under repairing or cleaning to be displayed on display board or to be entered in log book. 30. Fuses removed to be tagged and Equipment Nos. to be clearly mentioned on the tag by electrical personnel.				

Doc. No. RESCO/HSE/F-27A/Rev.05 Annexure – 5.6 Date: 01.04.2022	CONFINED SPACE WORK PERMIT	RESCO GLOBAL WIND SERVICES PVT. LTD.
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No.

Job Location : _____

ISSUER:

Valid: Date - _____ From Time - _____ AM / PM To Time - _____ AM / PM

Job Description: _____

Job carried out by : Own / Contractor **No. of Persons to be involved:** _____

Name of the Contractor: _____

Name of persons: 1) _____ 2) _____ 3) _____

4) _____ 5) _____ 6) _____

7) _____ 8) _____ 9) _____

Sr. No.	CONFINED SPACE ENTRY PERMIT (Vessel / Storage Tank / Ball Mill / Other)	Yes	No	NA
1	Vessel properly emptied.			
2	Vessel made free of Trace Gases / Materials by proper means.			
3	Electrical Isolation done (Disconnecting / Removing Fuse) by Mr. _____ Register Entry (Sr. No. _____ Time _____)			
4	All lines leading to and from vessel are disconnected. Valves are closed and blanked.			
5	Switch brought to "OFF" position, locked and tagged.			
6	Absence of Flammable / Toxic vapours Checked (O ₂ content should be > 19 % by Volume). Ensure Fresh Air supply (compressed Air)			
7	Proper lighting is provided.			
8	Safety belt / ladder are used.			
9	Observer posted outside the manhole with life line			
10	PPE used (please tick whichever applicable) - a) Hand Gloves b) Safety Goggle c) Nose Mask d) Face Shield e) Safety Belts f) Other (Specify)			
11	Additional Safety precautions, (if any) -			

This permit is issued on date ----- from Time ----- AM / PM to ----- AM / PM.

After inspections of all safety requirements I / we approve this Work Permit.

Name:	Name:	Name:
Signature	Signature	Signature
Issuing officer	Executing officer	Safety Officer / Shift In-charge

RENEWAL OF PERMIT (SECOND DAY)
After re-inspections of all safety requirements I / we renew this Work Permit.

Date _____ from Time _____ AM / PM to _____ AM / PM.

I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.

Name:	Name:	Name:	Name:																								
Signature	Signature	Signature	Signature																								
Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee																								
RENEWAL OF PERMIT (THIRD DAY) After re-inspections of all safety requirements I / we renew this Work Permit. Date _____ from Time _____ AM / PM to _____ AM / PM.			I have read and understood the precautions and safety measures mentioned herein and agree to abide by the same.																								
Name:	Name:	Name:	Name:																								
Signature	Signature	Signature	Signature																								
Issuing officer	Executing officer	Safety Officer / Shift In-charge	Permittee																								
CLOSURE / CANCELLATION OF PERMIT			<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> <th>NA</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Yes	No	NA																					
Yes	No	NA																									
1	The job is completed. All personnel withdrawn. Tools used during work are removed from the work place.																										
2	Electricity made available by placing fuses / unlocking switches / removing tags.																										
3	Work site is cleaned and free of debris and waste.																										
4	All flame / spark producing equipment and other auxiliary equipment are removed from location.																										
5	Equipment / machine is electrically / mechanically connected, checked and handed over to user department.																										
6	All site conditions inspected and found safe.																										
7	The permit is CLOSED / CANCELLED .																										
Date: _____		Time: _____ AM / PM																									
Name: Signature (Officer / Section Head Executing Dept.)		Name: Signature (Officer / Section Head Issuing Dept.)	Name: Signature (Safety Officer / Shift In-charge)																								
PROCEDURE & RECORD KEEPING –																											
Two copies shall be prepared for each permit (PERMITEE & ISSUER) –																											
1. PERMITEE copy should be with the user and should be available on the site when work is in progress.																											
2. ISSUER copy should be retained with issuer for record.																											
3. After completion of the job, Permit should be returned to issuing department for record.																											
4. Permits to be preserved for One Week from date of completion of the Work.																											
INSTRUCTIONS FOR ISSUING WORK PERMIT:																											
16. The permit is valid maximum up to 03 days. 17. Any kind of over writing makes the permit invalid (only issuing authority can do corrections to the permit with Name and signature. 18. Presence of any Flammable / Toxic vapours and O ₂ level to be checked and recorded. 19. Permit to be available at work site till closure / cancellation of permit. 20. “CAUTION: MAINTENANCE IN PROGRESS” to be displayed at work site till closure / cancellation of work permit. 21. The permit does not relieve the user of his responsibility with respect to SAFETY. 22. In case of fire, uncertain situation or sounding of fire /emergency siren, stop the work and proceed to the assembly point. 23. If more than one agency is required to work on the same equipment, each agency should put individual electrical isolation tag on the electrical isolation panel. 24. The period of validity of permit must be strictly observed. Any extension of period should be endorsed. 25. User of Permit should not make any utility connection on his own. 26. After completion of work or at the end of the shift, user must return the work permit to the issuing department. 27. The person working must be experienced in the job he is doing. 28. Issuing department should check all parameters as stated in Work Permit. 29. Vessel / Storage Tank / Ball Mill / etc. under repairing or cleaning to be displayed on display board or to be entered in log book. 30. Fuses removed to be tagged and Equipment Nos. to be clearly mentioned on the tag by electrical personnel.																											

Doc. No: RESCO/HSE/F-28/Rev.05 Annexure:5.7 Date:01.04.2022		Electrical Lock Out/Tag Out Permit LOTO					
Requested by Permit Holder:				Permit Sr. No.:			
Requested by Permit Acceptor:				Name of IGESL Emp./Contractor:			
Work Location:				Department:			
From Date:				To:			
Time From:		AM/PM		To:		AM/PM	
Description of Work:							
Safety Precautions for Clearance				Normalizing after Cancelling Permit			
1	Danger Tags Fixed		Done		Not Done		
2	Isolate/Breaker Switch off		Done		Not Done		
3	Fused Removed/Breaker Withdrawn		Done		Not Done		
4	Spare Heater Fused Removed				Not Done		
5	Aux Supply Switched Off/Fuses Removed				Not Done		
6	Transformer Isolated from Both ends	☐		☐	Not Done		
7	Equip Earthed/Earting Truck inserted/earthing rod put				Not Done		
8	Equipment Locked	a) , b) , c) , d) ,			Not Done		
9	Other Precaution Detail						
I certify that equipment mentioned above is isolated from all sources of power and is safe to work.				I hereby declare that the above checks have been made and the conditions have been normalized.			
				TAG NO.			
	Permit Acceptor	Permit Issuer	Site Head/HS E/Head		Permit Acceptor	Permit Issuer	
Signature							
Name							
Company							
Date & Time							

Doc. No: RESCO/HSE/F-28A/Rev.05 Annexure:5.7 Date:01.04.2022		Electrical Lock Out/Tag Out Permit LOTO			RESCO GLOBAL WIND SERVICES PVT. LTD.						
Requested by Permit Holder:				Permit Sr. No.:							
Requested by Permit Acceptor:				Name of IGESL Emp./Contractor:							
Work Location:				Department:							
From Date:				To:							
Time From:		AM/PM		To:		AM/PM					
Description of Work:											
Safety Precautions for Clearance				Normalizing after Cancelling Permit							
1	Danger Tags Fixed	☐	Done	☐	Not Done	1	Earth rod Removed	☐	Done	☐	Not Done
2	Isolate/Breaker Switch off	☐	Done	☐	Not Done	2	Circuit Breaker Inserted	☐	Done	☐	Not Done
3	Fused Removed/Breaker Withdrawn	☐	Done	☐	Not Done	3	Fuses Put Back	☐	Done	☐	Not Done
4	Spare Heater Fused Removed	☐	☐	☐	Not Done	4	Aus Supply Fuses Put/Switched on	☐	Done	☐	Not Done
5	Aux Supply Switched Off/Fuses Removed	☐	☐	☐	Not Done	5	Spare Heater Switches Put/Switched on	☐	Done	☐	Not Done
6	Transformer Isolated from Both ends	☐	☐	☐	Not Done	6	Isolator/Breaker Switched on	☐	Done	☐	Not Done
7	Equip Earthed/Earting Truck inserted/earthing rod put	☐	☐	☐	Not Done	7	Danger Tag Removed	☐	Done	☐	Not Done
8	Equipment Locked	e) , f) , g) , h) ,				8	Equipment Locked Removed	e) , f) , g) , h) ,			
9	Other Precaution Detail					9	Other Precautions Normalized Details				
I certify that equipment mentioned above is isolated from all sources of power and is safe to work.						I hereby declare that the above checks have been made and the conditions have been normalized. TAG NO.					
	Permit Acceptor	Permit Issuer	Site Head/HS E/Head		Permit Acceptor	Permit Issuer	Site Head/ HSE Head				
Signature											
Name											
Company											
Date & Time											

PERMIT TO WORK-PTW

Valid only when signed by an authorized issuer, delegated by management. This permit must be issued before specified work is started, it must be closed / cancelled immediately after completion of the work or at the end of the shift as agreed by parties Identified on this permit. File closed /cancelled permits in chronological order in a file, which will be kept in site / unit. Permit will be issued only in presence of both concerned engineer and work supervisor.

Issue Date : _____ **Site:** _____ **Section :** _____
Permit No. : _____ **Lock out No. :** _____ **Validity :** _____
Location : _____ **Issued for work in:** _____ (e.g. WTG /HT/ Substation etc.)
Job description: _____

Following safety measures taken to carry out work:

	Yes	No	N/A
1. Proper approach i.e. scaffolding / ladder etc. provided	☐	☐	☐
2. Underground / overhead cables checked for intervention	☐	☐	☐
3. Held Tool Box Talk (TBT)	☐	☐	
4. Following PPE's required to be used:			
a) Eye / Face ☐	b) Safety belt & fall arrester ☐	c) Earth rod ☐	
d) Hand / Head / Leg Protection ☐		e) 33 KV Hand Gloves ☐	
5) Any other work permit issued for same WTG / Feeder / Substation on same date and time Yes / No if Yes, Permit No. _____			
6) Any Other High Risk Activity i.e. Hot Work, Work at Height etc involved along with this PTW/Activity (Separate PTW taken) YES ☐ NO ☐ If yes mention-_____ PTW No _____			
7) Any other safety precaution required _____			
8) Following isolation carried out ☐	Isolation not required ☐		

Sr. No.	Equipment / Device Name	Description of isolation / LOTO	Sign.	Description of normalization of isolation / LOTO	Sign.

This certifies that as per JSA / JHA /HIRA/TRA/SOP I Have personally competed inspection of the area where this work is to be done, As well as the surrounding area. I Have reviewed all necessary precaution to be taken to protect the personnel engaged in this work from accident and injury. I Have made sure that the assigned personnel know the applicable safety rules and those they know what to do in an EMERGENCY.

Responsibility (Permit) accepted by: _____ Date & Time: _____ Sign. _____
Responsibility (Permit) issued by: _____ Date & Time: _____ Sign. _____
Permit valid from: _____ Hrs. / _____ / _____ (Date) & expires at: _____ Hrs. / _____ / _____ (Date)

PTW Extension (If the work is going to extend & complete within 1.30 hours after the validity time)

			Extension Time	
PTW Extended by (Issuer)		PTW extension Accepted by	Expire Time	

Details of work done: _____

Housekeeping done after the work activity - (Yes) (No)
Waste collected and deposited designated place- (Yes) (No)

SAFETY WORK PERMIT CLOSURE

WORK SATISFACTORILY COMPLETED.

WORK AREA AND EQUIPMENT RELEASED IN PROPER CONDITION FOR NORMAL USE.

WORK NOT FINISHED, to be continued with a new work permit issued by another competent person

WORK SUSPENDED, as present conditions are not conducive for carrying the work safely.

Details of any other reason for closure / cancellation _____

Name of Authorized Person _____ Date & Time : _____ Signature _____

Note: Only Issuing personal is authorized to close the Permit. (During any Emergency conditions or absence of Permit Issuer only Site In charge/Section in charge is authorized for closing the PTW after verification /consultation with site personals (Job Executer)

Doc. No. RESCO/HSE/F31/Rev.01 Annexure: 5.9 Date: 01.04.2022	GENERAL WORK PERMIT (PTW)	RESCO GLOBAL WIND SERVICES PVT. LTD.
PTW No.		Permit Issued For:
NOTE: This Work Permit is valid for 8 Hrs/One shift only, after signed by an authorized issuer, delegated by management as only for work, date & time mentioned. Re permit or extension of PTW required after completion either 8 hrs or shift change which competed first.		
Please tick " "for respective applicable area else tick "X" if not applicable. (Do not keep anything blank)		
Name of site	Permit issue date & time	
Contractor Name	Permit valid up to time	
Type of work	☐ Civil Work ☐ Excavation ☐ Electrical work ☐ Hot work ☐ Erection & Dismantling ☐ Work at Height ☐ Mechanical Work ☐ Other type work(Specify):-	
Description of work		
A. Identified Associated Hazards with work which is to be carried out:		
1	Fall from height ☐	3 Fall in pit ☐ 5 Electrical short circuit/shock ☐ 7 Fire ☐
2	Slip/Trip/fall ☐ 4 Physical Hazard ☐ 6 Fall of lifted weight ☐ 8 Any other Hazard ☐	
B. Required PPE for work,to be carried out :		
1	Safety Helmet Reflective jacket ☐ 1 Safety Goggles/Face Shield ☐ 3 Electrical Hand gloves/Cotton ☐ 5 Ear Plug / Ear Muffs ☐	
2	Full body Harness(FBH) ☐ 2 Safety Shoes/Gumboots ☐ 4 Nose Mask/Dust Mask ☐ 6 Any Specific ☐	
C. General Precautions for all types of work:		
1	Contractor's Supervisor available to inspect & control work at site. ☐ 5 First Aid Box Available at the work site. ☐	
2	Required Fire Fighting equipment's are available at work site. ☐ 6 Deactivate system element. LOTO applied. Warning/cautionary sign board displayed. ☐	
3	Disconnect & Secure/earth short-circuits electrical sys, cover adjacent component. ☐ 7 Adequate Lighting provision made incase work needs to carry out after sunset also (with PTW renewal). ☐	
4	Keep personal protective equipment ready. ☐ 8 Check atmosphere/breathing air. ☐	
D. Work Specific Precautions:		
ERECTION WORK		
1	Erection area barricaded. ☐ 3 All tools are in good condition. ☐	
2	Fitness of Crane & other equipment verified ☐ 4 All unwanted material removed from work location. ☐	
EXCAVATION & CIVIL WORK		
1	Fitness of Excavator & other equipment verified ☐ 5 Warning boards displayed indicating falling hazard. ☐	
2	Area cleared from Electrical Cables/Blasting etc. & All unwanted material removed from work location. ☐ 6 Excavation soil shall be kept minimum 1.5 meter away from edge of pit and ☐	
3	Excavation area barricaded. ☐ 7 All electrical fitments & supply lines are safe to operate. ☐	
4	Ladder & scaffolding or other means of access provided. ☐ 8 Crow bars with rubber handles provided. ☐	
ELECTRICAL WORK		
1	Electrical Supply Isolated & locked. ☐ 3 LOTO followed. ☐	
2	Adequate earthing provided. ☐ 4 All tools are in good condition and insulated. ☐	
WORKING AT HEIGHT		
1	All employees are physically fit to work at height. ☐ 3 All hand tools are secured against accident fall. ☐	
2	Work platform provided are with guard rail & are sufficient space. ☐ 4 Workmen provided with tool bags. ☐	
I have read all & make sure that the necessary precaution to protect the Personnel engaged in this work from Accident /injury. We assure that all applicable safety rules to be followed for this work.		
Permit Issuer (Inox Engg)		Permit Receiver (Sub-Con Engg / Sup)
Name:		Name:
Sign:		Sign:
Mob No:		Mob No:
		EHS Contact Number:
PERMIT EXTENSION		
From DateTime.....am/pm DateTime.....		
Permit Issuer		Permit Receiver
Name:		Name:
Sign:		Sign:
Work Permit Closing System		
Time & Date. at which the permit is closed. Name of the closing Authority.....Signature.....		

Doc No. IGESL/HSE/F-31/Rev.05 Annexure:5.9 Date: 01.04.2022			TOOL BOX TALK (T.B.T.)							
TBT No.			SITE:			Section:			Date:	
A Participant Name- Company Employee CE -IWISL,CW-Contract Worker, CU- Customer										
S.N.	Name	CE	Emp.No.	Sign.	S.N.	Name	CE/CW/CU	Emp.No.	Sign.	
1					6					
2					7					
3					8					
4					9					
5					10					
B Cheak Point (Please check the following points and tick mark accordingly)										
S.N.	Details	Availability			Discussion done			Details/Remark if any		
1	Previous record of following while performing similar type	YES		NO	YES		NO			
2	Unsafe condition/act	YES		NO	YES		NO			
3	Near miss	YES		NO	YES		NO			
4	Working condition	YES		NO	YES		NO			
5	Tool bag condition	YES		NO	YES		NO			
C Roles and Responsibility										
S.N.	Name		Responsibility		S.N.	Name	Role	Responsibility		
1					6					
2					7					
3					8					
4					9					
5					10					
D PPE Inspection										
S.N.	PPE (Please mention below the list of PPE being used)	Inspection			Remark			Action required if any		
1		Done		NO	OK		Not Ok			
2		Done		NO	OK		Not Ok			
3		Done		NO	OK		Not Ok			
4		Done		NO	OK		Not Ok			
5		Done		NO	OK		Not Ok			
E Additional Information										
S.N.	Safety precautions (please mention the additional safety)	Special PPE/Tool to be used			In case of emergency ,action to be taken			Others (Not included if any)		
1										
2										
3										
4										
F TBT Conducted by:										
S.N.	Name	Em	Sign.		S.N.	Name	Emp.	Sign.		
1					3					
2					4					

DocNo. RESCO/HSE/F-31A/Rev.05 Annexure: 5.9 Date: 01.04.2022				TOOL BOX TALK (T.B.T.)				RESCO GLOBAL WIND SERVICES PVT. LTD.							
TBT No.				SITE:				Section:				Date:			
A Participant Name- Company Employee CE -IWISL,CW-Contract Worker, CU- Customer															
S.N.	Name	CE/CW/CU	Emp.No.	Sign.	S.N.	Name	CE/CW/CU	Emp.No.	Sign.						
1					6										
2					7										
3					8										
4					9										
5					10										
B Cheak Point (Please check the following points and tick mark accordingly)															
S.N.	Details		Availability			Discussion done			Details/Remark if any						
1	Previous record of following while performing similar type		YES		NO	YES		NO							
2	Unsafe condition/act		YES		NO	YES		NO							
3	Near miss		YES		NO	YES		NO							
4	Working condition		YES		NO	YES		NO							
5	Tool bag condition		YES		NO	YES		NO							
C Roles and Responsibility															
S.N.	Name	Role	Responsibility			S.N.	Name	Role	Responsibility						
1						6									
2						7									
3						8									
4						9									
5						10									
D PPE Inspection															
S.N.	PPE (Please mention below the list of PPE being used)		Inspection			Remark			Action required if any						
1			Done		NO	OK		Not Ok							
2			Done		NO	OK		Not Ok							
3			Done		NO	OK		Not Ok							
4			Done		NO	OK		Not Ok							
5			Done		NO	OK		Not Ok							
E Additional Information															
S.N.	Safety precautions (please mention the additional safety to be taken)		Special PPE/Tool to be used			In case of emergency ,action to be taken			Others (Not included if any)						
1															
2															
3															
4															
F TBT Conducted by:															
S.N.	Name	Emp. code	Sign.			S.N.	Name	Emp. code	Sign.						
1						3									
2						4									

Doc. No. IGESL/EHS/F-32/Rev.05 Annexure 5.11		INSPECTION CHECKLIST FOR BLADE WORK			
Date: 01.04.2022					
PROJECT / O&M: -			Location -		
Permit No:			Date & Time:		
Inspection by:			Approximate Height:		
Equipment's to be used:					
Description of the work: -					
Sr. No.	Follow Safety rules compulsory	Yes	No		
01	Is a risk assessment carried out keeping in mind the hazards associated with the evolving position and the upcoming task?				
02	Is HIRA /JSA is developed for activity involving the sky lift				
03	Is Sky lift along with tools is certified and document available at site.				
04	Interlock of sky lift gates are working properly				
05	Is safety lock device in working condition				
06	Is sky lift operated by competent/trained person				
07	Electrical cords (Supply connected with ELCB/RCB)				
08	Is the Man – Basket sling well fixed onto the Nacelle Generator hook and hooking systems closed and locked by U clamp?				
09	Work is carried the supervision of location engineer & Supervisor				
10	Are Cables, Bridles and Shackles, the parts of the rigging system in healthy Conditions (no rust, cable bending).				
11	Are safety harnesses, lanyards and their accessories in good condition?				
12	Is the demarcation to restrict access around the work area in place and adapted to the work.				
13	Is a lockout to realize before the work? If YES, is it done follow the Lotto system.				
14	Guide rope & sling is in good condition.				
15	Ensure the overhead power cables are at safe distance prior to lift the man basket.				
16	Is life line secured & tie up properly along with Fall arrestor				
17	Communication system (Walk talkie) is available at site to perform the job.				
18	Ensure the wind speed before lift the banks man basket (Minimum 0.6)				
19	Sky lifts operating remote working properly without any disturbances.				
20	Emergency preparedness plan are aware to the working team & Emergency contact numbers displayed at work location				
21	Area free from Any Pot hole/debris/obstacles				
22	Ensure PPE's, first aid box & drinking water facility.				
23	Other condition if any to be Observed.				
Acceptor Name & Sign (Vendor) Site Engineer (IGESL) Site HSE Person (IGESL)					

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	SAFETY DURING CIVIL CONSTRUCTION	Guideline No IGESL SITE/HSE/006
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1. OBJECTIVE:

This manual is intended to provide useful information and guidelines for health and safety procedure in civil construction work at our wind sites. This manual can also provide our company's information to meet its GOAL and obligations. It contains information on incident prevention, together with a complete explanation of its use, and benefit with method of application.

2. PURPOSE:

This guidelines / instructions provide the safe work practice during the civil construction activities at a wind site.

3. HAZARDS DURING CONSTRUCTION:

- a. Fall of Material due to improper handling.
- b. Injury to person due to fall from height/Material fall/Struck with any object.
- c. Skin irritation & respiration issue due to cement dust or contact with chemical & cement.
- d. Cut injury due to sharp edge of tools.
- e. Electric shock to person due to use of power tools.

4. GENERAL SAFETY RULES AT CONSTRUCTION SITE:

4.1 ROCK BLASTING FOR WTG FOUNDATION:

a. Hazards for men & environment:

- i. Injury due to rock Falling/land slide during blasting.
- ii. Noise
- iii. Shock
- iv. Serious Injury

b. Legal Requirement:

- i. Blasting agency must have following licenses issued by the department of Petroleum and Explosives Safety Organization (PESO) formerly **Department of Explosives**.
 - a. Explosive Supplier license
 - b. Explosive blaster license
 - c. Explosive van licence for transportation purpose.
- ii. This license with the purpose of blasting shall be intimated by IGESL to the Local Police & Administration, who will issue the blasting permission.
- iii. No blasting shall be carried out without the above blasting permission.

c. General provisions:

- i. Only authorized, qualified and experienced personnel shall handle explosives.
- ii. Blasting work shall be carried out after approved permit as attached per Annexure 6.2.
- iii. No person shall be allowed to handle, use, or work in the area while under the influence or suspicion of being under the influence of alcohol or drugs.

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- d. **WARNING SIGNAL** – A one (1) minute series of long horn or siren blasts five minutes prior to the blast imminent signal.
- e. **BLAST SIGNAL** – A series of short horn or siren blasts one minute prior to the shot detonation.
- f. **ALL CLEAR SIGNAL** – A prolonged horn or siren blast (15 seconds duration) following the inspection of the blast area.
- g. Blasting shall be performed during daylight hours only.
- h. Blasting will concur within the environmental guidelines of the project and the site- specific requirements. Lightning detectors will be located in the blasting area.
- i. Drill holes shall not be left loaded overnight, unless security personnel are left on site and site lighting is provided. Detonators will not be connected to blasting agents and left overnight. This practice is strongly discouraged.
- j. Empty packing material shall not be used again for any purpose and disposal shall be at an approved location.
- k. Damaged or deteriorated blasting supplies shall not be used.
- l. Delivery and issue of explosives shall be made by and to only authorized persons and into authorized magazine or temporary storage or handling areas.
- m. All loading and firing will be directed and supervised by a competent and experienced person.
- n. All blasting by safety fuse or non-electric shall follow standard industry guidelines in regard to use and safety.
- o. Precautions will be taken to minimize the potential hazard of a premature detonation due to induced currents by using only non-electric blasting methods.
- p. Blasting mats or back fill material must be utilized to control fly-rock damage to surrounding structures.

- A. **Personal Protective Equipment (PPE'S):** All peoples engaged in excavation work will be provided with appropriate PPE'S.

At all time:

- i. Safety Helmet
- ii. Safety Shoes

When conditions necessitate

- i. Hearing Protection (Ear plug or Earmuff)
- ii. Eye protection(Safety goggle)
- iii. Dust Mask
- iv. Jacket

- B. **Other documents are to be Maintained at site:**

- i. Inventory Register - for Explosive
- ii. Explosive Issue / received register from Magazine
- iii. Blasting Register - mentioning date & time , No of holes , type of explosive , amount of charge , Firing pattern & sequence
- iv. Blasting Permit.

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4.2 WORKING AT HEIGHT:

Wind power sector's prime risk is working at height not only in construction / erection phase but in O & M activities also, so additional awareness and precaution has to be taken.

a. General Provision:

- i. While working at a height of more than 2 meters, ISI marked full body safety harness shall be used. Appropriate fall protection system shall be used.
- ii. While working at a height of more than 2 meters, permit should be issued by competent person before commencement of job.
- iii. Person's who have valid height work permit shall be allowed to work at height.
- iv. Worker should be well trained on usage of safety belt & fall arrester including its proper usage at the time of ascending / descending on the WTG tower.
- v. All tools shall be carried in tool kits to avoid their falling.
- vi. Always maintain 3 point contact while using ladder.
- vii. If the job is on fragile / sloping roof, roof walk ladders shall be used.
- viii. Provide lifeline wherever required.
- ix. Additional safety measures like providing Fall Arrester type safety belt, safety net should be provided depending upon the site conditions, job requirements.
- x. Keep working area neat and clean. Remove scrap material immediately.
- xi. Don't throw or drop material/equipment from height.
- xii. Avoid jumping from one member to another. Use proper passage way.
- xiii. Keep both hands free while climbing? Don't try to bypass the steps of the ladder.
- xiv. Try to maintain calm at height. Avoid over exertion.
- xv. Avoid movements on beam or other narrow places.
- xvi. Elevated workplaces including roofs or top of WTG tower should be provided with safe means of access and egress such as stairs, ramps or ladders or lift.
- xvii. Access and egress to the project/erection work area should be properly made by means of ramps, stairs, ladders, scaffolds and platforms.
- xviii. Stairs, Ladders, Platforms etc. should have preferred slope, handrail, mid rail, toe board & antiskid properties.
- xix. Safety belt / full body harness should be provided to the all workmen involved in working at height more than 2m. Anchorage should be ensured to a permanent structure.
- xx. In special circumstances fall arrester should be used when use of safety belt is not practical.

b. Roof work

- i. All roof-work operations should be pre-planned and properly supervised.
- ii. Roof work should only be undertaken by workers who are physically and psychologically fit and have the necessary knowledge and experience for such work.
- iii. Work on roofs shouldn't be carried on in weather conditions that threaten the safety of workers.
- iv. Crawling boards, walkways and roof ladders should be securely fastened to a firm structure.
- v. Roofing brackets should fit the slope of the roof and be securely supported.
- vi. Where it is necessary for a person to kneel or crouch near the edge of the roof, necessary precautions should be taken.

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- vii. On a large roof where work has to be carried out or near the edge, a simple barrier consisting of crossed scaffold tubes supporting a tubing guardrail may be provided.
- viii. All covers for openings in roofs should be of substantial construction and be secured in position.
- ix. Roofs with a pitch of more than 10 should be treated as sloping.
- x. When work is being carried out on sloping roofs, sufficient and suitable crawling boards or roof ladders should be provided and firmly secured in position.
- xi. During extensive work on the roof, strong barriers or guardrails and toe-boards should be provided to stop a person from falling off the roof.
- xii. Where workers are required to work on or near roofs or other places covered with fragile material, through which they are liable to fall, they should be provided with suitable roof ladders or crawling boards strong enough and when spanning across the supports for the roof covering to support those workers.
- xiii. A minimum of two boards should be provided so that it is not necessary for a person to stand on a fragile roof to move a board or a ladder, or for any other reason.

5. SCAFFOLDING, PLATFORMS AND LADDERS:

a. General Check Points:-

Capacity:

- i. Support own weight and 4 X the maximum intended load.
- ii. Suspension rope & hardware, 6 X the maximum intended load.
- iii. Stall load of scaffold hoist not to exceed 3 times its rated load.
- iv. Designed by a qualified person and built and loaded to design.

b. Scaffold platform construction / erection.

- i. Platforms fully planked or decked & not more than 1" gaps.
- ii. Scaffold platforms and walkways 18" wide.
- iii. Ladder jack, top plate bracket, roof bracket, and pump jack scaffold at least 12" wide.
- iv. Guardrails and/or personal fall arrest systems for platforms and runways not less than 18" wide.
- v. Front edge of all platforms No more than 14" from the face of the work, 3" from the face for outrigger scaffolds & 18" from the face for plastering and lathing operations.
- vi. Platforms 10' and less to extend at least 6" but not more than 12" past support unless designed and installed and/or guarded properly.
- vii. Platforms greater than 10' no more than 18" past support unless designed and installed and/or guarded properly.
- viii. Each abutted end of plank shall rest on a separate support surface.
- ix. Overlap platforms not less than 12" only over supports, unless restrained to prevent movement.
- x. On direction changes, any platform on a bearer at other than a right angle shall be laid first, and platforms which rest at right angles over the same bearer laid second.
- xi. No paint on wood platforms, except edges that may be marked for identification
- xii. Fully planked between front upright and guardrail support
- xiii. No mixed scaffold components used unless compatible and integrity maintained
- xiv. No modification of mixed scaffold components unless a competent person approves

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- xv. No components of dissimilar metals unless approved by competent person

c. Access

- i. Must have safe access, No access by cross brace
- ii. Bottom rung not more than 24" high
- iii. Never overload
- iv. No shore or lean-to scaffolds
- v. Inspected by competent person
- vi. Immediately removed or repaired, braced if found substandard
- vii. Maintain clearance near power lines.
- viii. Erected, moved, dismantled or altered only under supervision of competent person
- ix. No work on snow, ice covered platforms
- x. Tag lines on swinging load
- xi. Protect suspension ropes from heat, acid, sparks, abrasion etc.
- xii. No work during storms or high winds
- xiii. Personal Fall Arrestor System (PFAS) in lieu of guardrails on some scaffolds
- xiv. Use cross bracing in lieu of top or mid rails in suitable cases.

c. Falling object protection:

- i. Hard hats i.e. safety helmet required.
- ii. Protect employees / workers bellow.
- iii. Barricades to exclude working bellow.
- iv. Toe boards at edges of platforms.
- v. Canopies may be used where suitable.
- vi. Materials used in the construction of scaffolds should be stored under good conditions and apart from any material unsuitable for scaffolds.
- vii. Couplers should not cause deformation in tubes. Couplers should be made of drop forged steel or equivalent material.
- viii. Tubes should be free from cracks, splits and excessive corrosion and be straight to the eye, and tube ends cut cleanly square with the tube axis.
- ix. A scaffold should never extend above the highest anchorage to an extent which might endanger its stability and strength.
- x. Loose bricks, drainpipes, chimney-pots or other unsuitable material should not be used for the construction or support of any part of a scaffold.

e. Inspection should more particularly ascertain that:

- i. Materials used in its construction are sound and of sufficient strength;
- ii. It is of sound construction and stable; The scaffold is of suitable type and adequate for the job;
- iii. That the required safeguards are in position.
- iv. A scaffold should not be erected, substantially altered or dismantled except by or under the supervision.
- v. Every scaffold should be maintained in good and proper condition, and every part should be kept fixed or secured so that no part can be displaced in consequence of normal use.
- vi. If out-rigger scaffolding is to be used, it should be specifically designed and inspected before putting in use.

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f. Lifting appliances on scaffolds

- I. When a lifting appliance is to be used on a scaffold;
- II. The parts of the scaffold should be carefully inspected to determine the additional strengthening and other safety measures required;
- III. Any movement of the scaffold members should be prevented;
- IV. If practicable, the uprights should be rigidly connected to a solid part of the building at the place where the lifting appliance is erected.
- V. Ladders:
 - i. All ladders shall be constructed of sound material of adequate strength.
 - ii. All ladders shall be adequately supported and secured in position.
 - iii. Ladders shall extend at least 1metre above the place of landing or be 1metre higher than the highest rung to be reached by the person using the ladder.
 - iv. Metal ladders shall not be used near unprotected live electrical conductors.
 - v. Ladders shall be erected at a safe angle (4' up for 1' out) and shall be lashed at the top to prevent slipping.
 - vi. Ladders shall not exceed 30 ft in length. Ladders must not be lashed together for greater heights. Intermediate landings must be provided to reach higher than 26 ft.
 - vii. Tools and materials shall not be carried up ladders so that both hands are free to grip the ladder. The materials can be carried slung over the shaller or hauled up using a hand line.
 - viii. Always maintained 3 point contact while using ladder.
 - ix. Wooden ladders shall not be used.
 - x. When carrying ladders always keep the front end high enough to clear a person's head. When erecting ladders always get assistance. Take extra care when passing through.
 - xi. Make shift ladder must not be used at site.

g. Inspection of scaffolding, ladder & man-cage etc.

- I. Scaffolding being used at site shall be re-inspected by the competent Scaffolders once in a week. Green Tags of the Scaffolding which are found safe shall be renewed with date of inspection and signature of the competent Scaffolders.
- II. If any scaffold is found unsafe for use, competent Scaffolders shall place a red scaffold tag and stop the usage of scaffold until rectification.
- III. Scaffold under which personnel are to pass shall be provided with screen or equivalent between the toe board and handrail.
- IV. For decking only planks of 2 inches scaffold grade lumber or laminated wood shall be used. Scaffold planks shall be stored separately from ordinary lumber. These planks should be used exclusively for decking.
- V. Trestle scaffolds shall not be more than three tiers and the working platform shall not be more than 4.5m above the ground or floor or other surface upon which the scaffold is erected and no trestle scaffold shall be erected on a suspended scaffold. Men shall not be allowed to work from scaffolds during storm or high winds.

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Red Scaffold Tag

This tag indicates that the scaffold is under erection or dismantling or has not been inspected or is not safe for use (by anyone other than scaffold gang).

Green Scaffold Tag

This tag indicates that the scaffold is complete & it has been inspected by competent person and is safe for use. GREEN scaffold tag is valid for one week from the date of last inspection.

For ladder and man-cage is inspected in the presence of site safety in-charge.

6. STRUCTURAL WORK, LYING OF REINFORCEMENT & GENERAL REQUIREMENTS:

- a. The erection or dismantling of buildings, structures, civil engineering works, false work and shoring should be carried out by trained workers only under the supervision of a competent person.
- b. Precautions should be taken to guard against danger to workers arising from any temporary state of weakness or instability of a structure.
- c. Formwork, false work and shoring should be so designed, constructed and maintained that it will safely support all loads that may be imposed on it.
- d. Formwork should be so designed and erected that working platforms, means of access, bracing and handling and stabilizing are easily fixed to the formwork structure.

7. ERECTION AND DISMANTLING OF STEEL AND PREFABRICATED STRUCTURE:

- a. The safety of workers employed on the erection and dismantling of steel and prefabricated structures should be ensured by appropriate means, such as provision and use of:
- b. Safety harnesses and lifelines, catch nets or catch platforms;
- c. Steel and prefabricated structures should be so designed and made that they can be safely transported and erected.
- d. In addition to the need for the stability of the part when erected, the design should explicitly take following into account:
 - I. The conditions and methods of attachment in the operations of transport, storing and temporary support during erection or dismantling as applicable;
 - II. Methods for the provision of safeguards such as railings and working platforms, and, when necessary, for mounting them easily on the structural steel or prefabricated parts.
- e. The hooks and other devices built in or provided on the structural steel or prefabricated parts that are required for lifting and transporting them should be so shaped, dimensioned and positioned as:
 - I. To withstand with a sufficient margin the stresses to which they are subjected;
 - II. Not to set up stresses in the part that could cause failures, or stresses in the structure itself not provided for in the plans, and be designed to permit easy release from the lifting appliance. Lifting points for floor and staircase units should be located (recessed if necessary) so that they do not protrude above the surface;
 - III. To avoid imbalance or distortion of the lifted load.
- f. Store places should be so constructed that:
 - I. There is no risk of structural steel or prefabricated parts falling or overturning;

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- II. Storage conditions generally ensure stability and avoid damage having regard to the method of storage and atmospheric conditions;
- III. Racks are set on firm ground and designed so that units cannot move accidentally.
- IV. While they are being stored, transported, raised or set down, structural steel or prefabricated parts should not be subjected to stresses prejudicial to their stability.
- g.** Every lifting appliance should:
 - I. Be suitable for the operations and not be capable of accidental disconnection;
 - II. Proper quality of pulley block should be used. In no case pulley block suitable for fiber ropes should be used for steel wire ropes.
 - III. Lifting hooks should be of the self-closing type or of a safety type and should have the maximum permissible load marked on them.
 - IV. Tongs, clamps and other appliances for lifting structural steel and prefabricated parts should:
- h.** Be of such shape and dimensions as to ensure a secure grip without damaging the part;
- i.** Be marked with the maximum permissible load in the most unfavorable lifting condition.
- j.** Structural steel or prefabricated parts should be lifted by methods or appliances that prevent them from spinning accidentally.
- k.** When necessary to prevent danger, before they are raised from the ground, structural steel or prefabricated parts should be provided with safety devices such as railings and working platforms to prevent falls of persons.
- l.** While structural steel or prefabricated parts are being erected, the workers should be provided with appliances for guiding them as they are being lifted and set down, so as to avoid crushing of hands and to facilitate the operations. Use of such appliances should be ensured.
- m.** A raised structural steel or prefabricated part should be so secured and wall units so propped that their stability cannot be imperiled, even by external agencies such as wind and passing loads before its release from the lifting appliance.
- n.** At work places, instruction should be given to the workers on the methods, arrangements and means required for the storage, transport, lifting and erection of structural steel or prefabricated parts, and, before erection starts, a meeting of all those responsible should be held to discuss and confirm the requirements for safe erection.
- o.** During transportation within the construction area, attachments such as slings and stirrups mounted on structural steel or prefabricated parts should be securely fastened to the parts.
- p.** Structural steel or prefabricated parts should be so transported that the conditions do not affect the stability of the parts or the means of transport result in jolting, vibration or stresses due to blows, or loads of material or persons.
- q.** When the method of erection does not permit the provision of other means of protection against fall of persons, the workplaces should be protected by guardrails, and if appropriate by toe-boards.
- r.** When adverse weather conditions such as snow, ice and wind or reduced visibility entail risks of accidents, the work should be carried on with particular care, or, if necessary, interrupted.
- s.** Structures should not be worked on during violent storms or high winds, or when they are covered with ice or snow, or are slippery from other causes.
- t.** If necessary, to prevent danger, structural steel parts should be equipped with attachments for suspended scaffolds, lifelines or safety harnesses and other means of protection.

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- u. The risks of falling, to which workers moving on high or sloping girders are exposed, should be limited by all means of adequate collective protection or, where this is impossible, by the use of a safety harness that is well secured to a strong support.
- v. Structural steel parts that are to be erected at a great height should as far as Practicable be assembled on the ground. When structural steel or prefabricated parts are being erected, a sufficiently extended area underneath the workplace should be barricaded or guarded. Steel trusses that are being erected should be adequately shored, braced or guyed until they are permanently secured in position.

8. Reinforcement

- a. Ensure that workers use Personnel Protective equipment like safety helmet, safety shoes, gloves etc.
- b. Don't place the hand below the rods for checking clear distance. Use measuring devices.
- c. Don't wear loose clothes while checking the rods.
- d. Don't stand unnecessarily on cantilever rods.
- e. To carry out welding/cutting of rods, safety procedures/precautions as mentioned in Hot work section of this document.
- f. For supplying of rods at heights, proper staging and/or bundling to be provided.
- g. Ensure barricading and staging for supplying and fixing of rods at height.
- h. For short distance carrying of materials on shoulders, suitable pads to be provided.
- i. While transporting material by trucks/trailers, the rods shall not protrude in front of or by the sides of driver's cabin. In case such protrusion cannot be avoided behind the deck, then it should not extend 1/3rd of deck length or 1.5M whichever is less and tied with red flags/lights.

9. CONCRETE PUMPING:

- a. Careful attention should pay to positioning of the pumping equipment and any stabilizing devices to allow for the safe discharge of the concrete delivery trucks.
 - I. If the concrete pumping equipment set-up is in an enclosed or semi-enclosed area, special attention should be given to hazards created by the build-up of dangerous exhaust fumes and high noise levels.
 - II. Ensure that engine exhaust gases from the pump and the delivery trucks are directed away to the open air and a build-up of fumes cannot occur in the work area.
 - III. An increase to the normal operating noise level may occur due to sound being reflected back other structures. Prolonged exposure to high noise levels causes permanent hearing damage. Suitable control measures may need to be in place to ensure those persons affected are protected.
- b. When pumping in non-daylight hour's adequate lighting is provided.
- c. There is clear access for delivery trucks.
- d. Where multiple concrete deliveries are expected and on-site traffic management is not provided, only one delivery truck can approach and discharge into the hopper at a time. When a designated on-site traffic controller is provided the following safety rules should be followed:
 - I. All personnel connected with the discharging of concrete trucks are to wear appropriate high visibility or reflective safety vests.
 - II. All concrete delivery trucks must have operational reversing beepers.
 - III. The traffic controller and any truck discharging at the pump should be in positions which prevent

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them from being caught between the hopper and a reversing truck.

- IV. The traffic controller should be in a position visible to the reversing driver and where the hopper area can be observed.

10. ROAD CONSTRUCTION (PLAIN AND HILL AREA), CRANE PLATFORM MAKING, PCC:

a. Hazards for men & environment:

- I. Difficult Mountain / hilly terrains, Cave-in position.
- II. Handling of Earth moving equipment's & Rollers, Pneumatic Driller, Concrete mixer machines, under / Overhead power lines.
- III. Venomous insects, wild animals, reptiles.
- IV. Unnatural weather condition (heavy rain, high wind etc.), Working in Unprotected trench / excavated pit, Confined spaces, leading edges,
- V. Falls (from height) / slips / trips.

b. Do's:

Excavation:

- I. While clearing the floor area take care from venomous insects, use gumboots and hand gloves.
- II. Crow bar, shovel and other tipping tools must be providing with wooden handle.
- III. Ensure and check there is an underground utility passing (Electric lines, water line). Provide cautionary boards and traffic control.
- IV. Do barricading on excavated pit / trenches
- V. Use ladder for access and Egress to all excavation / trench.
- VI. Always provide a way to exit a trench / excavated pit -such as a ladder, stairway or ramp.
- VII. While working inside the excavated pit shall provide firm support for supporting loose soil / suspended rock (i. e., Protective system made with posts, beams, shores or blanking and hydraulic jacks etc.) then do the work.
- VIII. While working in night hours (after 6.00 pm) get proper work permission from concern departments & provide proper illumination in the working area as well as machineries / equipments parking area.
- IX. Do proper earthing when temporary Power supply installed.(D.G etc)
- X. Use three core cable, plug top and socket for power connection (D.G, lighting etc.)

HILL AREA:

- I. While doing cutting activity on valley, ensure stability of soil and ensure adequate protection for men & machine.
- II. While working under any suspended rock / cave-in of hill area must provide firm protective support for suspended rock / cave-in then do the work. (i., e., Protective system made with posts, beams, shores or blanking and hydraulic jacks etc.)
- III. Ensure BARRICADES or CURBING whenever the valley slope is >45 degrees.
- IV. Ensure barricades and curbing are painted white and black to improve visibility during driving at night.
- V. Ensure SIGNAGES are erected appropriately for cautioning bends, blind turns, and speed limits throughout the course of road.

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- VI. Install proper rainwater drainage system to reduce road erosion.
- VII. Maintain roads periodically.

PPE & Others:

- I. Use of PPEs including, safety shoes, Gumboots Helmet, Hand gloves.
- II. Strictly adhere IGESL Drug; Alcohol & Tobacco free work place policy & Guidelines.
- III. Keep First aid box and Fire Extinguisher in at site.

c. Don'ts

- I. Never stand / walking on the edge of the excavated area.
- II. Never enter an unprotected trench / excavated pit.
- III. Do not wear loose clothing (Lungies etc)
- IV. Do not allow child labour on work.
- V. Never place the concrete mixer machine / D.G etc on the edge of the excavated pit. It may cause fatality to those who are working inside the pit. (So keep the equipments at **least 2 meter** away from edge).
- VI. Do not lateral travel for work man more than 25 feet.
- VII. Site shall be barricaded and provided with warning signs, including night warning lamps at appropriate locations for traffic diversion.
- VIII. Filled and empty bitumen drums shall be stacked separately at designated places.
- IX. Road rollers, Bitumen sprayers, Pavement finishers shall be driven by experienced drivers with valid driving license.
- X. Workers handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate shall be provided with PVC hand gloves and rubber shoes with legging up to knee joints.
- XI. Mixing aggregate with bitumen shall preferably be done with the help of bitumen batch mixing plant, unless operationally non-feasible.
- XII. At the end of day's work, surplus hot bitumen in tar boiler shall be properly covered by a metal sheet, to prevent anything falling in it.

Break down Procedure

- I. Before starting maintenance work make sure electrical isolation is done.
- II. Maintenance & other repair must be performed by authorized person only.
- III. Do not bypass any safety mechanism, guards, etc. If any failure occurs, ensure rectification
- IV. / Replacement and till such time ensure temporary safeguards

11. HAZARDOUS SUBSTANCES STORAGE AND HANDLING:

- a) To ensure the risks associated with the use of hazardous substances are minimized, no hazardous substance will be brought on site without approval from and WIND SITES - state infrastructure head. Its subsequent use will be subject to appropriate controls to ensure personnel know how to use the substance safely and only use the substance with the correct PPE.
- b) It is mandatory that before any substance likely to affect the health or safety of persons is brought to the site, a Material Safety Data Sheet (MSDS) shall be provided at least seven days prior to the product arrival and a copy maintained at the following locations:

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- I. Project HSE representative.
- II. At the site first aid facility.
- III. At the place of storage of the hazardous substance.
- IV. The control of hazardous substances transport, storage and use must comply as per the requirements of “Hazardous Wastes (Handling and Management) Rules 2003 (as amended from 1989)” and the “Manufacture, Storage and import of Hazardous wastes Rules 1989”.

1. WORKMEN SHELTER / REST ROOM, FABRICATING YARD, STORE:

a. Hazards for men & environment:

- I. Collapse of shelter due to improper construction.
- II. Fire due to welding work in casting yard.
- III. Injury due to poor housekeeping.

b. Do's

- I. Ensure that shelter made by experience person.
- II. Ensure pole for shelter are properly placed into ground.
- III. Ensure that there is no holes in shelter cover (Tarpaulin).
- IV. Provide appropriate platform in shelter for distance from ground.
- V. Fabricating yard ground surface should be properly finished.
- VI. Ensure electrical wiring is proper no loose connection and open wire.
- VII. Keep proper housekeeping in store.
- VIII. Keep fire extinguisher in store and fabricating yard.
- IX. Use PPEs Helmet, Safety shoes, Hand gloves.

c. Don'ts

- I. Do not prepare a shelter bellow the electric line or pole.
- II. Do not keep flammable material in shelter and fabricating yard.
- III. Do not Blocked gangways in store and fabricating yard.
- IV. Do not prepared kitchen shelter near workman shelter.
- V. Do not stack heavy material on height in store.

2. WTG FOUNDATION-EXCAVATION, PCC & PLATFORM MAKING:

a. Hazards for men & environment:

- I. Fall hazard in to excavated pit and trenches.
- II. Noise hazard.
- III. Struck with heavy earth moving equipment's.

b. Underground Work:

The main dangers which may arise from work near underground services are summarized below. The term “service(s)” means all underground electricity, gas, water, piped sewage and telecommunications. Buried services are widespread and it should be assumed that they are present until it is proved otherwise. The standards contained in the Project Safety Instructions of Underground Services should be

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considered, and adopted as appropriate to the work in order to ensure that the risks are controlled and thereby a safe system of work exists.

Typical hazards could include:

- I. Severe and potentially fatal burns.
- II. Direct electric shock.
- III. Injuries resulting from gas explosive and/or fire. iv. Injury from a high pressure water jet.

A permit to excavate shall be completed and issued to the persons or Company carrying out digging work requiring an excavation.

Safety Precautions and Procedures:

c. Do's

- I. All excavation work should be planned and the method of excavation and the type of support work required shall be decided considering the following..
- II. Ensure and check there is a underground utilities passing (Electric lines, water line).
- III. Allow only Licence holder and experience driver to operate Hydra excavator and road roller for excavation and crane platform preparation.
- IV. Ensure all machines (Hydra) should have been tested for operational safety and possess test certificates.
- V. Barricade the excavated pit/Trenches.
- VI. Excavated, other materials or concrete mixture machine must be kept at least **2meter** back from the edge of a trench / pit.
- VII. Safe angle of repose of particular type of soil while excavating trenches exceeding 1.5m (5') depth up to 3.0m should be maintained. Based on site condition, proper sloping should be provided corresponding to the angle of repose of the soil (usually 45 deg), and suitable bench of 0.5m width at every depth of 1.5m of excavation in all soils except hard rock. Otherwise proper shoring and strutting to prevent cave-in or slides.
- VIII. In case of blasting, follow strictly IS: 4081-1986 & Indian Explosive Act and rules for storage, handling and carrying of explosive materials and execution of blasting operations.
- IX. Sites of excavation should be thoroughly inspected.
 - 1) Daily, prior to each shift and after interruption in work of more than one day;
 - 2) After every blasting operation;
 - 3) After an unexpected fall of ground;
 - 4) After substantial damage to supports;
 - 5) After a heavy rain, frost or snow;
- X. Wherever there is a possibility of any ingress of water, then pumping shall be established with pumps being readily available for use.
- XI. Where ever the depth of excavation is more than 2 mtr. Shall be treated as confined space. Obtain confined space permit and fulfill its requirement.

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- XII. Always provide a way to exit a trench / excavated pit -such as a ladder, stairway or ramp - no more than 25 feet of lateral travel for workmen in the trench.
- XIII. While working inside the excavated pit shall provide firm support for supporting loose soil / suspended rock (i. e. Protective system made with posts, beams, shores or blanking and hydraulic jacks etc.) then do the work.
- XIV. Use ladder for access and Egress to all excavation/trench.
- XV. Be careful when handling a concrete to avoid it getting into eye or directly contact with body at time of PCC.
- XVI. Area is clear off before use of road roller/JCB at the time of crane plate form preparation..
- XVII. Use Safety/Gum shoes, Helmet, Hand gloves.

d. Don'ts

- I. Do not allow anyone near work area at the time of excavation by Hydra.
- II. Do not dump excavated material at the edge of the excavated pit.
- III. Do not stand/walking on the edge of the excavated area.
- IV. Do not handle concrete with bare hand.
- V. Do not stand/sit on moving machinery.
- VI. Do not allow any body beside or near the roller at time of crane platform preparation.

3. PCC & RCC FOR LATTICE STRUCTURE ELECTRICAL COMPONENT, TRANSFORMER:

a. Hazards for men & environment:

- I. Cement dust.
- II. Sharp edge or steel.
- III. Moving machinery.

b. Do's

- I. Allow only experience person.
- II. Stack and store materials properly to limit the risk of falling objects.
- III. Handling material properly and get a co-worker to help if a material is too heavy.
- IV. Be careful when handling a concrete to avoid it getting into eye or directly contact with body.
- V. Use wooden platform for walking on shuttering.
- VI. Provide appropriate guard to moving machineries.
- VII. Use PPEs helmet, Gum shoes, PVC/Rubber hand gloves, Dust mask.

c. Don'ts

- I. Do not stand/sit on moving machinery.
- II. Do not handle concrete with bare hands.
- III. Do not walk or work under overhead loads.

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4. POLE EXCAVATION, INSTALLATION, FOUNDATION & STRINGING:

a. Hazards for men & environment:

- I. Under / Overhead power lines crossing, Electric shock, Flashover, Fire, Arcing.
- II. Falling of person from height / slips / trips, falling of objects.
- III. Difficult Mountain / hilly terrains.
- IV. Pneumatic Driller, Boring Machine.
- V. Venomous insects, wild animals, Reptiles.

b. Do's

EXCAVATION:

- I. Ensure and check there are no underground utilities passing (Electric lines, water line). Provide cautionary boards and traffic control.
- II. Be careful not to hit your leg while doing excavation manually by axe.
- III. Do Barricading on excavated pit / trenches and provide warning boards.

POLE INSTALLATION & STRINGING:

- I. Pole installation shall be done by trained personnel with adequate supervision.
- II. Use Suitable guide ropes for lifting and temporary anchoring purpose, up to concrete curing.
- III. Ensure that Bipod is properly connected to tractor and pole with suitable rope when lifting and tractor speed shall kept minimum
- IV. Provide proper Stays to pole while stringing activity.
- V. Use suitable hand line and pulley for Fixing of V-cross arms, vertical top supports & pin insulators at poles
- VI. Use safety belt and helmet when working on pole for stringing / insulator fixing activity.
- VII. Safety shoes as well as helmets must be used while doing ground activities

c. Don'ts

- I. Do not stand close to boring area when excavation done by boring m/c
- II. Never stand / walk on the edge of the excavated area.
- III. Never enter an unprotected trench /excavated pit.
- IV. Do not wear loose clothing (Lungies etc)
- V. Do not allow child labour on work
- VI. Never place the concrete mixer machine / D.G etc /other material on
- VII. the edge of the excavated pit
- VIII. Do not drop or throw the materials / the tools from top.
- IX. Do not drop cable drum on ground.
- X. Do not stand /work below where over head line stringing activity is going on.

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5. WTG TRANSFORMER STRUCTURE INSTALLATION:

a. Hazards for men & environment:

- I. Fall of material due to failure of lifting tools and tackles,
- II. Injury to person due to fall of material,
- III. Fall hazard,

Safety Precautions and Procedures:

b. Do's

- I. Allow only trained and license holder operator to operate crane.
- II. Check all lifting tools and tackles before use for damage.
- III. Ensure slings are properly inserted into crane hook and I bolt before lifting.
- IV. Use man basket form transformer frame/platform erection.
- V. Check men basket for damage before use.
- VI. Use safety belt while working on height and in man basket, ensure proper anchoring of fall arrester.
- VII. Provide proper guide rope to the transformer structure at the time of erection and main frame alignment. Ideally anchor four corners of the platform with separate / independent ropes to avoid any imbalance of the platform in case any rope fails.
- VIII. Use appropriate tools and Keep all tools safely while working on height.
- IX. Use proper body posture while cable lying from transformer LT box to inside tower.
- X. Use ladder after platform erection for climbing on platform and one person for securing ladder.
- XI. Use Helmet, Hand gloves, Safety shoes.

c. Don'ts:

- I. Do not use damage or faulty lifting tools and tackles.
- II. Do not stand or work on lifted transformer structure.
- III. Do not allow anyone under lifted transformer/transformer structure at time of erecting or movement.
- IV. Do not dropped or thrown the materials / the tools from top.
- V. Do not use damage or faulty ladder.

6. VCB (Vacuum circuit breaker) AND METERING YARD CONSTRUCTION:

a. Hazards for men & environment:

- I. Falling of person from height / slips / trips, falling of objects.
- II. Injury to person, fall of material due to failure of lifting tools and tackles.
- III. Difficult Mountain / hilly terrains.
- IV. Venomous insects, wild animals, Reptiles.

b. Do's

- I. Ensure and check there is an underground utility passing (Electric lines, water line).
- II. Secure your legs while manually excavation by axe.

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- III. Pole installation shall be done by trained personnel with adequate supervision.
- IV. Use Suitable guide ropes for lifting and temporary anchoring purpose, up to concrete curing of pole.
- V. Ensure that Bipod properly connect to tractor and pole with suitable rope when lifting and tractor speed shall kept minimum
- VI. Provide proper Stays to pole while stringing activity.
- VII. Use suitable guide line and pulley for Fixing of insulators and Isolator.
- VIII. Be careful when preparing steel binding for VCB plinth to avoid cut/crush injury.
- IX. Use proper method for lifting VCB/CT, PT.
- X. Check all lifting tools and tackle before lift if mechanically handling is require.
- XI. Use safety belt when working on pole for stringing / insulator fixing activity. Safety shoes, Helmet.

IV. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Doc. No. RESCO/HSE/F-33/Rev.05 Annexure: 6.1 Date: 01.04.2022	ENVIRONMENT HEALTH & SAFETY SCAFFOLDING CHECKLIST	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Name of Site : _____ **Location:** _____
Inspected By : _____
Scaffolding Location : _____
Inspection Date : _____

SL.NO.	CHECKPOINTS	YES	NO	REMARKS
1	Construction strong enough for the purpose used (Material, no. of men etc.)			
2	Are all the scaffolding components being in place without any defects.			
3	Erection is carried under the supervision/as per the direction of competent person			
4	Secured to building / permanent structure at enough places to prevent movement /collapse.			
5	Base plates provided			
6	Proper Access- Ladders provided/ Safe egress and Ingress provided			
7	Width of platform sufficient to the purpose			
8	Materials stored on the platforms properly secured or not?			
9	Usage of Proper couplers			
10	Hand rails provided			
11	Mid rails Provided			
12	Toe Boards provided			
13	Full body double lanyard (Safety belts) provided			
14	Scaffolding tag is provided for "Safe to work" & Emergency contact details.			
15	Safe distance is maintained from over headlines power lines			
16	Any other: Kicker lift, Green tag provided by certified scaffolding supervisor, Loose material removed from platform, Barricade the scaffolding area, Diagonal bracing to be provided as per design.			

Contractor Scaffolding Supervisor: _____

Safety Officer: _____

Site Engineer: _____

Doc. No. RESCO/HSE/F-34/Rev 05. Annexure: 6.2 Date: 01.04.2022	ENVIRONMENT HEALTH & SAFETY BLASTING WORK PERMIT		RESCO GLOBAL WIND SERVICES PVT. LTD.
Date & time			
Area /Project Name			
	Name	Signature	
PTW Issuer RESCO (HOD)			
PTW Acceptor RESCO site Engineer			
Contractor Details			

Name of the Approved Blaster/Short Firer	Name: License No:	Signature:
Blasting material Volume:	No of holes drilled& depth:	No of Relay/Delay used:
No of workmen involved in Drilling & Blasting:	No of cartridges loaded:	Any Blasting Left in Volume :

Necessary safety aspects of the job are considered & precaution taken as mentioned below
The Following precautions are to be taken by the department.

Sl. no	Check Points	YES	NO
1	Surrounding area as well as the inside of tank& / or enclosures are clear of combustibles / flammable materials.		
2	No Vehicle /Vehicle components are laying within the area of the permit issued.		
3	Personal protective equipment's are provided to blasting team.(helmet, goggle, ear muff, shoes, jacket, gloves, dust mask, other specify.)		
4	Explosives handled & used as per M.S.D.S. Supplied by manufacture.		
5	Before using explosives, necessary working & danger signal are erected at conspicuous place of such use to warn workers & the general public of the danger involved in such use. - Blasting Siren		
6	Strictly prohibited, any source of ignition, mobile, naked flame, loiters, within charging area (50 mtr.)		
7	Authorized Explosive van used for transport.		
8	Authorized Explosive van transporter is medically fit		
9	Explosive van -vehicle document is valid (Registration/License/Fitness/PUC)		
10	Uses only non-sparking tools should be used for handling explosives.		
11	Explosives are handled by Govt. authorized person only		
12	Ensure & evacuate all workers at safe assembly points		
13	All movement stopped around 500mtr. 50 mtr. Area should cordon at the time charging the drilling holes.		
14	Crew people with red flag &whistle available.		
15	All electrical current / panel mobile any other live current are off (around radius 300m)		
16	Misfiring check after removing fumes only after time delay as mentioned in explosive rules.		

Safety Officer: _____

Site Engineer: _____

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1. OBJECTIVE:

The manual should be used to induct employees / contractors / subcontractors for developing safety culture at site and continuously improve the work culture and efficient completion, running & forth coming of the project. Health safety and environment at wind sites is of permanent importance for the company, so it is important to follow safe work practices during project work.

2. PURPOSE:

This guidelines / instructions provide the safe work practice during the various activities during erection / installation at wind sites (RESCO).

These guidelines are also applicable while erection and de erection of WTG/Nacelle/Gear Box or major component replacement in O & M phase.

3. HAZARDS DURING ERECTION / INSTALLATION:

- Fall of Material due to improper handling and defective /untested tools.
- Injury to person due to fall from height/Material fall/Struck with any object.
- Skin irritation due to cement dust or contact with chemical & cement.
- Cut injury due to sharp edge of tools.
- Electric shock to person due to use of power tools.

4. LATTICE STRUCTURE, CONDUCTOR STRINGING AND ELECTRICAL COMPONENTS INSTALLATION:

HAZARDS FOR MEN & ENVIRONMENT:

- Fall hazard from height.
- Cut injury due to hand tools or power tools operation

Do's

- Allow only experienced/skilled person to work.
- Ensure all machines Crane/Hydra should have been tested for operational safety and possess test and fitness certificates by competent authority.
- Ensure that channel of lattice structure is proper anchor/fastening by rope when handling with crane.
- Provide rope guide line to lattice tower channels when handling with crane.
- Ensure proper anchoring of pulley block and correct capacity of pulley to be used.
- Fixing and tightening of V-cross arms, vertical top supports & pin insulators at poles shall be done by using suitable hand line with pulley arrangement.
- Use safety belt with double lanyard and proper anchoring shall be done while working at height (Lattice tower).
- Use appropriate tools and place it securely after use.
- Use PPEs, Helmet, Safety shoes, Cotton hand gloves, and mask.

Don'ts:

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- n. Do not allow anyone under or near work area at the time of lattice structure being erected.
- o. Do not work under the suspended load.
- p. Do not throw materials or tools from top.
- q. Do not give jerk at the time of mechanical Handling of disc/pin insulator, isolators, CT, PT, Cross arms etc.

5. LOADING& UNLOADING OF WTG ACCESSORIES (TOWERS, NECELLE, GENERATOR, HUB ETC.) BY CRANE:

HAZARDS FOR MEN & ENVIRONMENT:

- a. Crane, Weight of crane accessories , Nearby over head power lines
- b. Failure of lifting tools and tackles.
- c. Working under suspended load, Sitting / standing near crane working radius
- d. Limit switches / other safety Control system not available / not functioning.

Do's:

- a. Ensure safe distances from nearby overhead LT/HT/EHT power line (if any).
- b. Check capacity of cranes before lifting of materials.
- c. Fully extend the outrigger & stabilize.
- d. Ensure the crane is on a firm / stable surface and level.
- e. Do inspection for all lifting tools and tackles & Crane before use it.
- f. Use correct capacity lifting tools and tackles (slings, shackles etc).
- g. Ensure proper signal code followed by crane operator and signal person.
- h. Ensure and verify functioning of limit switches, alarm systems etc.
- i. Ensure safe wind speed for crane operation.
- j. Ensure crane hook and safety latch is in good condition.
- k. If two cranes are used for lifting ensure proper co-ordination between them.
- l. Slings shall not be twisted during lifting.
- m. Tag lines shall be used to prevent dangerous swing or spin of materials when raised / lowered.
- n. Allow to stabilise the load before lifting.
- o. Prepare a levelled yard surface before placing the WTG materials on ground.
- p. Use **safety shoes, helmet, and gloves** and other PPE's for loading / unloading activity.

Don'ts:

- a. Never abruptly swing or stop the crane.
- b. Don't go or stand near crane radius.
- c. Don't use damaged tools and tackles.
- d. No temporary repairs on slings, shackles.
- e. Don't use damaged, distorted and field welded hooks.
- f. Do not exceed the SWL during lifting.
- g. Do not lift the section if unbalanced.
- h. Avoid standing under suspended loads unless it is absolutely necessary.
- i. Don't throw any waste on floor (chemical or any).
- j. Don't do any lifting and erection activity if wind speed is more than 10 m/sec.

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6. WTG FOUNDATION PREPERATION, CLEANING, SLAB INSTALLATION:

HAZARDS FOR MEN & ENVIRONMENT:

- Crane handling, Weight of slab.
- Failure of lifting tools and tackles, WTG Foundation opening.
- Flying particles while chipping, dust, Hand tools used for chipping.

Do's:

a. FOUNDATION SURFACE PREPARATION:

- Wear **goggles, hand gloves, Nose mask** while chipping of foundation surface, groove area.
- Proper care to be taken while hand tools using (hammer, chisel, hacksaw, knife etc.
- Use ladder for access and egress to WTG Foundation.

b. PLACING OF SLAB SEGMENTS:

- Ensure Eye bolts are properly fixed on concrete slab.
- Inspect Round slings and Shackles before use it. Check for capacity.
- Check for snags, punters, tears or cuts. Check for Stitching is broken or worn.
- Hands and fingers shall not be placed between the sling and load while sling is being tighten around the load.
- Make sure the hook is always over the centre of gravity of the load before lifting it.
- Ensure proper seating and alignment of slab on foundation surface.

c. CRANES:

- Check capacity of cranes before lifting.
- Ensure the crane is on a firm / stable surface and level.
- Ensure proper signal code followed by crane operator and signal person.
- Ensure crane hook and safety latch is in good condition.
- Allow to stabilise the load before lifting.

Don'ts:

- Avoid standing under suspended loads unless it is absolutely necessary.
- Never abruptly swing or stop the crane.
- Never shorten a sling with knots.
- Don't throw any waste on floor (chemical or any).

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7. WTG TOWER SEGMENT PREPERATION AT GROUND LEVEL:

HAZARDS FOR MEN & ENVIRONMENT:

- Height work,
- Slippery surface of segment,
- Uneven ground for ladder placing,
- Working under suspended load,

Do's:

- Proper Care to be taken while climbing on the concrete segments for ground preparations.
- Ensure a levelled base is prepared for the ladder before ascent.
- Check Ladder Physical suitability.
- Ensure Proper position and holding of ladder on ground by persons.
- Take adequate precaution while working under suspended load.
- Take proper body posture (stable position) at that time of preparation of segment at top.
- If possible, anchor oneself at the top of segment with the help of safety belt
- Use **helmet, goggles, and hand gloves** for segment preparation activity.
- Care to be taken while inserting segment guiding rods & attaching lifting accessories.

Don'ts:

- Don't use the faulty ladder.
- Avoid standing under suspended loads unless it is absolutely necessary.
- Don't throw any waste on ground (chemical or any)

8. WTG SEGMENTS INSTALATION:

HAZARDS FOR MEN & ENVIRONMENT:

- Crane, Failure of lifting tools and tackles.
- Failure of mounting platform Limit switches, Failure of wire ropes.
- Electrical shock, Suspended load.
- Height, working under suspended load.
- Sitting / standing near crane working radius.
- Hand crushes injury due to hanging load / Segment placing.
- Chemical use (epoxy), Chemical spillage on floor.
- Dust, Smoke, Fire, Manual material handling.
- Ladder / accessories fall while lifting by crane / man basket.
- Poor illumination, Chemical (lock tight) use.
- Manual adjustment of ladder Height.
- Manual material handling, Grease application, Grease spillage on floor.
- Height, slip, Hand tools / Hardware slip, Slippery Surface.
- Sharp Corners / edges, Space constraints.

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- o. Electrical shock, Power tools operation, Fire.
- p. Manual Material Handling, Weight of Material, Weight of cables, Chemicals (grease, lock tight etc.)
- q. Crane, nearby overhead power lines.
- r. Failure of lifting tools and tackles.
- s. Working under suspended load, Sitting / standing near crane working radius.

Do's:

- a. Check capacity of cranes before lifting according to load chart.
- b. Ensure lifting accessories and T-rods are properly inserted on hole provided at top surface.
- c. Proper care to be taken for handling T-Rods due to longer length and weight.
- d. Check condition of slings and D-Shackles used for lifting.
- e. Proper care to be taken for cleaning at the bottom surface of segment.
- f. Place wooden blocks before attempting to match the holes between segment and foundation. (Prevent hand crush injury).
- g. Ensure proper co-ordination between crane operator and signal person. Use of helmet by all is mandatory.
- h. Care to be taken while climbing up on to the segments to check the holes (use of steel mouse).
- i. Use ladder to go inside bottom of segment.
- j. Use **plastic hand gloves, goggles and nose mask** for preparation of grouting mix and grouting process.
- k. Care to be taken while using stirrer machine.
- l. Place the metal hatch on man-hole before proceeding to work on the concrete slabs.
- m. Inspect all parts of mounting platform before use.
- n. Check limits switches and wire ropes against damages.
- o. Ensure mounting platform is properly seated on the Foundation slab area for segment 2 installation.
- p. Check all cable connection and check functioning of all switches in the control panel.
- q. Operate the switches and Check rotation of winch.
- r. Maintain oil level of gearbox as specified.
- s. Check Proper functioning of all outriggers and free rotation rollers provided at bar.
- t. Check rotating handles for operation of extendable platform and get safeguarding by chains.

a. SHIFTING OF MOUNTING PLATFORM:

- I. After 2 segment installation, for shifting of mounting platform ensure platform is properly attached to crane hook and released of outrigger slings from holding clamps properly.
- II. Care to be taken for Lifting of platform and hook the ropes into the clamps provided on the segment surface.
- III. Slowly release the load from the crane so that weight of platform comes into holding ropes.
- IV. Carefully adjust the extendable platforms as per the inner diameter of respective segments.
- V. Carefully dismantle all lifting accessories from the erected segment as well as from the platform & bring back safely to the ground.
- VI. Use **safety helmet, shoes, belt, gloves, ear plug etc.**
- VII. Check appropriate capacity of cranes before lifting Tower segments.
- VIII. Ensure lifting accessories and T-rods are properly inserted on hole provided at top surface.
- IX. For removing the epoxy from the outside surface, Person lifting by man basket, Ensure attaching fall

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arrestor (damper) to the crane hook.

b. PLATFORM INSTALLATION:

Ensure attaching the fall arrestors (dampers) to hooking points while shifting the platform and while working on the platform.

c. PREPARING EPOXY MIXTURE:

- I. Use proper tool for opening lid.
- II. Wear Goggles, Hand gloves while pouring and mixing the epoxy compounds and follow MSDS instruction for chemicals.
- III. If any chemical spillage occurred, properly collect and follow safe disposal.

d. BOTTOM PREPARATION:

- I. Visually check all parts of the drum lifting fixture.
- II. Check all electrical connections and functioning of the motor, lifting accessories.
- III. Insert properly the driver shafts & supporting shaft into their respective positions and provide lock.
- IV. Thoroughly check all components attached with the steel ropes (shackles, locking devices, bushes).
- V. Ensure the rope strands are tied with the help of metallic wires against free releasing.

e. LIFTING:

- I. Care to be taken while lift the drum and attach to tower lifts for arresting the oscillation of the rope drum during work.
- II. Carefully operate the motor and Guide the ends of the rope strands into the holes of the tower flange.
- III. Sudden releasing of tied steel ropes can cause severe injury to personnel.

f. BOTTOM PREPARATION FOR PRE-STRESSING:

- I. Ensure proper ventilation, air circulation & lighting in bottom area.
- II. Use PPEs (**Goggles, Nose mask, Helmet, shoe, gloves, and ear plug**) while cutting the steel ropes. Neighbouring persons should avoid standing opposite to cutting position while the activity is in progress.
- III. Keep Fire extinguisher / water / sand bucket nearer to work place.
- IV. Provide proper lighting arrangement inside the Tower for ladder installation.
- V. Inspect ladder and its fasteners for good condition.
- VI. Ensure ladder parts are properly held & lifted by crane / man basket.
- VII. Use guide rope for guiding the ladder part for installation.
- VIII. Always hook a shock absorbing lanyard on crane hook for additional protection while installing the ladder & fasteners by using man basket
- IX. Use **Nose mask** while applying Lock tight to the nut bolt thread.
- X. Follow MSDS and manufacturer instruction.
- XI. Follow "3 point contact rule" viz. two legs and one hand always holding on installed ladder while working.

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- XII. While working on ladder secure with a shock absorbing lanyard to a bracket fitted to the tower or to a defined anchorage point.
- XIII. All required PPE viz. **helmet, safety shoes, and full body safety harness, and runner, gloves**, to be used.
- XIV. Properly place the machine house onto nacelle frame to avoid hand crush injury.
- XV. Properly fit the three fans underneath the side platform using a wrench and the fasteners. Wear **ear plug** when working with impact wrenches.
- XVI. Properly unload nacelle casing section and put support protection under the front and rear edges to prevent slip and fall.
- XVII. Properly Seal all connecting joints on the nacelle casing & clean the bonding areas for the silicon foam.
- XVIII. Fit both lower nacelle casing sections to the upper nacelle casing and tighten to the prescribed torque.
- XIX. Use **Rubber hand gloves** for grease application.
- XX. If any grease spillage occurred, properly collect and follow safe disposal.

g. MACHINE HOUSE ASSEMBLY:

- I. The machine house is held and/or steered in the correct position with one or two guiding ropes.
- II. Caution when taking the machine house: Risk of crushing hands or fingers.
- III. Wear PPE (safety belt) to protect against falling if there is a risk of falling. Only use the authorised attachment points. Be careful not to unintentionally loosen the snap hook from the attachment point.

h. BOLTING THE MACHINE HOUSE:

- I. When using the impact wrench and the hydraulic torque wrench. Wear **ear plug, safety goggles and protective gloves**. Wear PPE (**Safety belt**) to protect against falling if there is a risk of falling. Only use the authorised attachment points. Be careful not to unintentionally loosen the snap hook from the attachment point.
- II. Proper Care to be taken for separate the Generator from hub. Take precautions for working under suspended load.
- III. In order to protect the windings from damage when turning the generator, put a wooden block.
- IV. Ensure proper communication between two cranes while for turning the generator.
- V. Proper care to be taken for hoists the generator. From the ground, hold and / or steer the generator in the correct position using the two guiding ropes.
- VI. Unhook the generator only after having tightened the catch pins between the machine house and the generator with an impact wrench. Check condition of attaching devices (Hooks) for hub.
- VII. Properly attach a long guiding rope to both blades that point upwards when hoisting to help hold and steer the hub from the ground.
- VIII. Proper care to be taken while hoist the rotor hub to its final height and swing it in front of the machine house.
- IX. Hold and/or steer the rotor hub in the correct position using the two guiding ropes. Caution when taking the rotor hub: Risk of crushing hands or fingers.
- X. Wear PPE (**Safety belt**) to protect against falling if there is a risk of falling. Only use the authorised attachment points. Be careful not to unintentionally loosen the snap hook from the attachment point.
- XI. Only unhook the rotor hub after having torque tightened all bolts between the generator and the rotor hub.

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- XII. When using the impact wrench and the hydraulic torque wrench, wear **ear plug, goggles & gloves**.
- XIII. Only unhook the spinner cap (Nose cone) after proper tightens of bolt.
- XIV. Remove the guiding ropes on both upper rotor blades using a man basket and remove the protective shell from the rotor blade using a rod or similar object.
- XV. Follow work permit system for WTG Installation and Electrical / Commissioning.
- XVI. All equipment's (Multi meter etc.), tools are in good condition, properly insulated (as required) and calibrated / tested.
- XVII. Follow "3 point contact rule" viz. two legs and one hand always holding on installed ladder for fitting tower accessories (tube light, Polyamide clamps fitting etc.)
- XVIII. Use proper anchor points (eye screw/grips/other steel part firmly connected with machine carrier) for securing yourself. At least one lanyard/damper is to remain anchored when climbing in / out from the nacelle.
- XIX. While working on inside nacelle area ensure proper sitting / standing work position of personnel.
- XX. While working above the nacelle ensure safety belt with damper are properly anchored.
- XXI. Ensure proper coordination followed between persons while dropping / laying of cables.
- XXII. During dropping of cables ensure proper work positioning of all persons (Proper platform for sitting / standing). When pulling the cable, make sure that the cables do not get caught at any of the platforms, brackets, ladders. Because that could topple the cable drums as well as damage the cables and other add on parts.
- XXIII. Before releasing the winch, ensure that tower cable is installed properly and correctly in the polyamide clamps.
- XXIV. One person must be monitor and supervise all these activity carefully and guide to all persons to avoid any incidences and miscommunications.
- XXV. Before entering in the hub area, be conformed that hydraulic brake is applied and rotor is manually locked.
- XXVI. Stop brake (hydraulic) for rotor operates only if there is power. If power supply fails, it loses its braking effect. Hence apply mechanical rotor lock for doing any activity inside rotor / near rotor (within arm-length with mesh open) / below nacelle platform area / above nacelle area.
- XXVII. While working on the platform, close the platform hatch & secure yourself with fall arrestor at the anchorage point.
- XXVIII. Before loading and unloading of containers, ensure safe distances from nearby overhead LT/HT/EHT power line (if any).

i. WHILE USING CRANE FOR LIFTING:

- I. Check capacity of cranes before lifting of materials.
- II. Ensure the crane is on a firm / stable surface and level.
- III. Do inspection for all lifting tools and tackles & Crane before use. Ensure proper signal code followed by crane operator and signal person. Ensure safe wind speed for crane operation. Slings shall not be twisted during lifting.
- IV. Guide rope shall be used to prevent dangerous swing or spin of materials when raised / lowered.
- V. Allow to stabilise the load before lifting.
- VI. Ensure Proper co-ordination followed between trailer and crane by giving proper signal to them.
- VII. After loading into trailer provide proper support (wooden support, sling etc) for control the movement of

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container.

- VIII. Use **safety shoes, helmet, and gloves** for loading / unloading activity.

Don'ts:

- a. Never use faulty ladder.
- b. Never allow more than one person for signal to crane operator.
- c. Avoid standing under suspended loads unless it is absolutely necessary.
- d. Don't throw any waste on ground (chemical or any).
- e. Never abruptly swing or stop the crane.
- f. Don't use damaged tools and tackles.
- g. No temporary repairs on slings, Shackles.
- h. Don't use damaged PPE or Expired PPE.
- i. Avoid loose connections while joining the hydraulic connectors.
- j. Don't do any lifting and erection activity if wind speed is more than 10 m/sec.
- k. Don't hurry up the ladder for complete the job.
- l. Don't carry heavy objects or tools while climbing.
- m. Don't do any unauthorised work on ladder.
- n. Don't use damaged nacelle frame.
- o. Don't use damaged tools and tackles anyhow.

9. GENERAL SAFETY RULES AT ERECTION / INSTALLATION SITE:

- l. Do not begin following work in the site without a completed and authorized work permit. In addition to PTW during normal working hrs. all the works performed after normal working hrs. And on holiday require a separate night / holiday work permit & the same have to be signed by the working agency & concerned line manager & safety officer and authorized by the site in charge.
- m. The erection site shall be considered a restricted area and unauthorized entry into the site is strictly prohibited. Anyone found trespassing shall be asked to leave the site immediately.
- n. Photography shall be strictly prohibited unless express approval of site in-charge.
- o. Smoking, the use of fires (naked flame or open fires) and the use of spark producing equipment or tools are strictly prohibited except in approved areas of the site with valid work permit. It should be noted that smoking is not allowed even when the permit for use of fire or hot work is given at the place.
- p. No drugs, narcotics, alcoholic drinks are allowed at site also the personnel under influence of the above shall not be allowed at site. To be in possession of, or under the influence of drugs or alcohol is strictly forbidden.
- q. It is the employee's responsibility to conduct him/her in a manner that enables them to maintain a safe work environment for themselves and their fellow worker.
- r. Every effort must be made by the employee to keep the job sites clear of scrap material and other hazards.
- s. All employees should be aware of first-aid box locations and the names of employees holding valid certificates.
- t. The Company reserves the right to take disciplinary action when an employee refuses to abide by any safety rule/policy/procedure. The disciplinary action may go as far as dismissal.
- u. Horseplay of any degree is not permitted and will not be tolerated. There is to be no fighting with or threatening of fellow employees.
- v. Each employee should be familiar with the Emergency exits and Fire Extinguisher in the work area.

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- w. All safety hazards observed are to be corrected or immediately reported to your supervisor including any defects or damage to machinery, machine parts, equipment, or tools.

10. HOT WORK (CUTTING/WELDING):

- q. Common hazard involved in welding / cutting are sparks, molten metal, flying objects, harmful light rays, electrical shock etc. Hot work includes Welding, Gas Cutting Burning, Grinding, Soldering, Sand Blasting, Chipping, Riveting, Drilling, Power Tools, and Open Flames etc. The detailed should be checked as per **Annexure**
- r. A suitable fire extinguisher shall be made available/installed in work area.
- s. Proper arrangements for isolation / covering the area from the process side may be necessary if work is being done in close vicinity of process activities.
- t. Proper PPEs should be worn as per the requirement of specific job.
- u. Ensure that only approved and well-maintained apparatus, such as torches, manifolds, regulators, pressure indicators and pressure regulating valves and Acetylene generators are used for gas cutting.
- v. Return earthing / ground cable should be provided directly to the equipment / work place being welded and both the ground and welding cables should be intact and not cracked or worn out or with joints. The connection should not be established indirectly through pipelines / structures / equipment's etc.
- w. An energized electrode should never be left unattended and the power source shall be turned off at the end of job.
- x. Proper earthing of the welding machine itself should be ensured. The connection of the welding cable with the output pole of the welding machine should be done with proper fittings.
- y. Electrode holder shall be of good quality with proper insulation. The welder should never be allowed to weld when he is wet. Also the usage of proper personal protective equipment shall be ensured.
- z. All gas cylinders shall be properly secured in upright position and acetylene cylinders shall be turned and kept in such a way that the valve outlet points away from oxygen cylinder and vice-versa.
- aa. Storage of cylinder (either full or empty) shall be done at cool, dry place under shed. Filled and empty cylinders should be stored separately; Acetylene and Oxygen cylinder should be stored separately.
- bb. Flash back arrester shall be provided on the oxygen and acetylene cylinder as an additional precaution.
- cc. Cylinders should be transported on trolleys and should never be dragged. All cylinders should be checked for leakage, colour coding and valve cap before accepting. No cylinder should be accepted without proper color coding and valve cap.
- dd. Hoses of the cutting torch should be properly colored (red for acetylene and black for oxygen) and of same length. The lighting of the torch shall be done by friction lighter instead of match box. Hoses shall be checked for leakage before use. Also the hoses should not be dragged.

11. POWER & HAND TOOL OPERATION:

General Provision:

- a. All portable tools are to be connected through control bus with ELCB.
- b. All tools shall be inspected at Frequency of once in quarter & tag it. Inspection shall be posted on the tools.
- c. All contractors should ensure proper Earthing of all electrical equipment's used by them. Suitable earthing pits must be made if required.

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- d. Examine electric cable for defects before use.
- e. Do not ever insert free ends of wires into sockets and hold them in place with matchsticks / other means. Always use industrial three pin plugs.
- f. Check the RPM rating of grinding wheels. The RPM rating must be greater than or same to that of the driver. Wheel guard should be used in proper position before grinding. Also proper PPEs must be ensured (goggles & hand gloves).
- g. Do not tie electric cords to metal rods or nails.
- h. No cable should run under the ground. It must run overhead at a 2 m height to avoid pinch point and creating trip hazard.
- i. All tools and Tackles must be examined daily before commencing work and record to be maintained.
- j. Defective tools are to return to store.
- k. All electrical tools must be inspected & tested at regular intervals once in 3 months by an authorized electrical person and record to be maintained.
- l. The weight, size & type of tool should be selected to suit the job carried out.
- m. The handles of tools should be intact and properly tightened. Split handles should be replaced. To avoid slippage, grease and oil should be wiped off. Insulated and non-conducting tools shall be tested for electrical resistance.
- n. Wrenches should not be pushed but pulled. Chisels struck by others should be held by tongs and not by hands.
- o. Chipping should always be done away from self.
- p. Hand tools should not be allowed to lie down on benches, scaffoldings etc. from where they can fall. They should be properly stored.

12. TOOLS AND TACKLES INSPECTION:

An approved competent person shall first inspect the above materials. The said materials are coded and colored to indicate whether they are fit for use. Visual Inspection is carried out once in a quarter and recorded the findings

NOTE:

- a. Only inspected and certified lifting gears is to be used for lifting purpose.
- b. All concern engineer / lifting supervisors shall inspected the lifting gears has to be applied after thorough inspection and record of maintenance.

13. HANDLING OF LIFTING EQUIPMENTS:

- a. There should be a well-planned schedule to ensure that all the lifting appliances and lifting gear are selected, installed, examined, tested, maintained, operated and dismantled with a view to preventing the occurrence of any accident;
- b. All lifting appliances shall be examined by competent persons at frequencies as specified in "The Factories act, 1948 and Rules made thereof" and records maintained in specified Forms under Factories Rule (Applicability different in different states).
- c. Check thoroughly quality, size and condition of all lifting tools like chain pulley blocks, slings, U-clamps, D-shackles etc. before putting them in use.

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- d. Safe lifting capacity of all lifting & handling equipment, tools and shackles should be got verified and certificates obtained from competent authorities before its use. The safe working load (SWL) shall be marked on them.
- e. Check periodically the oil, brakes, gears, horns and tyre pressure of all moving equipments like cranes, forklifts, and trailers etc as per manufacturer's recommendations.
- f. Check the weights to be lifted and accordingly decide about the crane capacity, boom length and angle of erection.
- g. Allow lifting slings as short as possible and check packing at the friction points.
- h. While lifting/placing of the load, no unauthorized person shall remain within the radius of the boom and underneath the load.
- i. While loading, unloading and stacking of pipes, proper wedges shall be placed to prevent rolling down of the pipes. Control longer jobs being lifted up from both ends.
- j. Only trained & authorized operators and riggers should carry out the job. While the crane is moving or lifting the load, the trained rigger should be there for keeping a vigil against hitting any other object.
- k. During high wind conditions and nights, lifting of heavy equipment's should be avoided for the erection work of Tower and its Blade. If unavoidable to do erection in night, operator and rigger should be fully trained for night signaling. Also proper illumination should be there.
- l. Allow crane to move on hard, firm and leveled ground.
- m. When crane is in idle condition for long periods or unattended, crane boom should either be lowered or locked as per manufacturer's guidelines.
- n. Hook and load being lifted shall remain in full visibility of crane operators, while lifting, to the extent possible.
- o. Don't allow booms or other parts of crane to come within 3 meters reach of overhead electrical cables.
- p. No structural alterations or repairs should be made to any part of a lifting appliance, which may affect the safety of the appliance without the permission and supervision of the competent person.
- q. Details of inspection / testing shall be displayed on the equipment.

IMPORTANT NOTE:-

- a. Do not bypass any safety mechanism, guards, etc. If any failure occurs, ensure its rectification / replacement and till such time ensure temporary safeguards:
- b. In-case of electric shock cut off the supply and shift injured person to ventilated area first.
- c. If burn injury occurs then apply plenty of water to effected body part.
- d. If any injury occurs & bleeding is start, stop bleeding by pressing cotton cloth on effected body part.
- e. Transport the injured to nearby First aid centre / hospital.
- f. Notify supervisors when leaving. Report accident to the site in charge/functional Head/HSE Head.

14. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head- GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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(CHECK LIST TO BE FILLED BEFORE STARTING THE ACTIVITY)

Location : _____

Job Description: _____

Date : _____

WELDING AND CUTTING				
1	Hot Work Permit taken.	Yes ☐	No ☐	N/A ☐
2	Precautions are taken to protect welders as well as others working near the welding process a. Welding/ cutting shield attached with helmet b. Proper personal protective equipment –goggles, gloves, aprons, long sleeve shirt, and safety shoes provided.	No ☐	Yes ☐	N/A ☐
3	a. Cylinders are kept vertically. b. Cylinders of different gases are stored at separate locations.	No ☐	Yes ☐	N/A ☐
4	Precautions are taken to prevent an accumulation of toxic gases and fumes a. Multi gas detector b. ventilation c. mask	No ☐	Yes ☐	N/A ☐
5	Welding machine properly covered & protected from rain.	No ☐	Yes ☐	N/A ☐
6	Double body earthing done.	No ☐	Yes ☐	N/A ☐
7	Adequate fire extinguishers available near work area	No ☐	Yes ☐	N/A ☐
8	Remarks, if any:	No ☐	Yes ☐	N/A ☐
9	Cylinders must be stored in a well-ventilated, dry location & away from Combustible Materials.	No ☐	Yes ☐	N/A ☐
10	Cylinders in use must be chained or otherwise secured to prevent falling	No ☐	Yes ☐	N/A ☐
11	Flash back arrestors are installed at torch & cylinders side.	No ☐	Yes ☐	N/A ☐
12	Hoses are connected as per standard colour code & Check hose connections for correct threading with proper clamping.	No ☐	Yes ☐	N/A ☐
13	Hoses are free from dust, oil, grease & cracks	No ☐	Yes ☐	N/A ☐
14	Cylinders are kept in trolleys with chain mounted	No ☐	Yes ☐	N/A ☐
15	Trolley is in good condition	☐	☐	☐

		No	Yes	N/A
16	Gas cutting hoses are routing is free from any obstructions	No ☐	Yes ☐	N/A ☐
17	Cylinder are fitted with valve cap	No ☐	Yes ☐	N/A ☐
18	NUB Condition	No ☐	Yes ☐	N/A ☐
19	Flammable material removed from hot work area	No ☐	Yes ☐	N/A ☐

Signature of the Discipline Engineer : _____

Signature of the Safety Manager/Officer : _____

Doc. No. IGESL/HSE/F-35A/Rev.05 Annexure: 7.1 Date: 01.04.2022	CHECKLIST FOR WELDING & CUTTING	RESCO GLOBAL WIND SERVICES PVT. LTD.
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(CHECK LIST TO BE FILLED BEFORE STARTING THE ACTIVITY)

Location : _____

Job Description: _____

Date : _____

WELDING AND CUTTING				
1	Hot Work Permit taken.	Yes ☐	No ☐	N/A ☐
2	Precautions are taken to protect welders as well as others working near the welding process c. Welding/ cutting shield attached with helmet d. Proper personal protective equipment –goggles, gloves, aprons, long sleeve shirt, and safety shoes provided.	No ☐	Yes ☐	N/A ☐
3	a. Cylinders are kept vertically. b. Cylinders of different gases are stored at separate locations.	No ☐	Yes ☐	N/A ☐
4	Precautions are taken to prevent an accumulation of toxic gases and fumes d. Multi gas detector e. ventilation f. mask	No ☐	Yes ☐	N/A ☐
5	Welding machine properly covered & protected from rain.	No ☐	Yes ☐	N/A ☐
6	Double body earthing done.	No ☐	Yes ☐	N/A ☐
7	Adequate fire extinguishers available near work area	No ☐	Yes ☐	N/A ☐
8	Remarks, if any:	No ☐	Yes ☐	N/A ☐
9	Cylinders must be stored in a well-ventilated, dry location & away from Combustible Materials.	No ☐	Yes ☐	N/A ☐
10	Cylinders in use must be chained or otherwise secured to prevent falling	No ☐	Yes ☐	N/A ☐
11	Flash back arrestors are installed at torch & cylinders side.	No ☐	Yes ☐	N/A ☐
12	Hoses are connected as per standard colour code & Check hose connections for correct threading with proper clamping.	No ☐	Yes ☐	N/A ☐
13	Hoses are free from dust, oil, grease & cracks	No ☐	Yes ☐	N/A ☐
14	Cylinders are kept in trolleys with chain mounted	No ☐	Yes ☐	N/A ☐

15	Trolley is in good condition	No ☐	Yes ☐	N/A ☐
16	Gas cutting hoses are routing is free from any obstructions	No ☐	Yes ☐	N/A ☐
17	Cylinder are fitted with valve cap	No ☐	Yes ☐	N/A ☐
18	NUB Condition	No ☐	Yes ☐	N/A ☐
19	Flammable material removed from hot work area	No ☐	Yes ☐	N/A ☐

Signature of the Discipline Engineer : _____

Signature of the Safety Manager/Officer : _____

Doc. No. IGESL/HSE/F-36/Rev.05 Annexure: 7.2 Date: 01.04.2022	CHECKLIST FOR ERECTION/ DE ERECTION	
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(CHECK LIST TO BE FILLED BEFORE STARTING THE ACTIVITY)

Location : _____

Job Description : _____

Date : _____

CHECK POINTS			
1	All mandatory PPEs are using as follow a. Safety helmet b. Safety shoe c. Full body harness with runner/snap hook. d. Hand gloves.	☐ Y/N ☐ Y/N ☐ Y/N ☐ Y/N	
2	Barricading available in applicable area	No ☐	Yes ☐ N/A ☐
3	All tools and tackles having valid third party inspection.	No ☐	Yes ☐ N/A ☐
4	Physical condition of lifting tools and tackles are checked and found ok.	No ☐	Yes ☐ N/A ☐
5	Permit taken and available with site engineer/supervisor.	No ☐	Yes ☐ N/A ☐
6	Availability of site engineer/supervisor all the time till finished the job.	No ☐	Yes ☐ N/A ☐
7	Communication equipment (walky talky) available working condition.	No ☐	Yes ☐ N/A ☐
8	Electrical switch gear (ELCB/MCB) Available at site.	No ☐	Yes ☐ N/A ☐
9	Equipped first aid box available at site	No ☐	Yes ☐ N/A ☐
10	Emergency vehicle availability at site till end of the job	No ☐	Yes ☐ N/A ☐
11	Driving license and competence certificate available at site	No ☐	Yes ☐ N/A ☐
12	Remarks, if any:		

Signature of the Discipline Engineer : _____

Signature of the Safety Manager/Officer : _____

Doc. No. RESCO/HSE/F-36A/Rev.05 Annexure: 7.2 Date: 01.04.2022	CHECKLIST FOR ERECTION/ DE ERECTION	RESCO GLOBAL WIND SERVICES PVT. LTD.
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(CHECK LIST TO BE FILLED BEFORE STARTING THE ACTIVITY)

Location : _____

Job Description : _____

Date : _____

CHECK POINTS			
1	All mandatory PPEs are using as follow a. Safety helmet b. Safety shoe c. Full body harness with runner/snap hook. d. Hand gloves.	☐ Y/N ☐ Y/N ☐ Y/N ☐ Y/N	
2	Barricading available in applicable area	No ☐	Yes ☐
3	All tools and tackles having valid third party inspection.	No ☐	Yes ☐
4	Physical condition of lifting tools and tackles are checked and found ok.	No ☐	Yes ☐
5	Permit taken and available with site engineer/supervisor.	No ☐	Yes ☐
6	Availability of site engineer/supervisor all the time till finished the job.	No ☐	Yes ☐
7	Communication equipment (walky talky) available working condition.	No ☐	Yes ☐
8	Electrical switch gear (ELCB/MCB) Available at site.	No ☐	Yes ☐
9	Equipped first aid box available at site	No ☐	Yes ☐
10	Emergency vehicle availability at site till end of the job	No ☐	Yes ☐
11	Driving license and competence certificate available at site	No ☐	Yes ☐
12	Remarks, if any:		

Signature of the Discipline Engineer : _____

Signature of the Safety Manager/Officer : _____

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ELECTRICAL SAFETY	Guideline No IGESL SITE/HSE/008
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1.OBJECTIVE:

To provide Winds sites with proper & safe usage of Electricity.

2.GENERAL:

Following safety requirements shall be complied with before the contractor uses the power supply.

- a. The contractor shall submit a list of licensed electrical staff to be posted at Site.
- b. It shall be the responsibility of the contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at Site. All cabling and Installation shall comply with the appropriate latest statutory requirements given below and shall be subject to approval of the Engineer in Charge:
 - I. Indian Electricity Act.
 - II. Electricity (Supply) Act.
 - III. Indian Electricity Rules.
 - IV. National Electricity Code.
 - V. Other relevant rules of Local Bodies and Electricity Boards.
- c. The power supply shall be regulated as per the terms and conditions of the supply of the respective electricity boards.
- d. Where distribution boards are located at different places the contractor shall submit schematic drawing indicating all details like size of wires, overhead and Cable feeders, earthing etc. The position and location of all equipment and switches shall be given.
- e. The contractor shall make his own arrangement for main earth electrode and tapings thereof.
- f. The existing earth points available at site can be used at the discretion of Client with prior permission. Method of earthing, installation and earth testing results shall conform to relevant I.S. Specifications (IS-3043).
- g. All three phases' equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.
- h. All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.
- i. The contractor shall not connect any additional load without prior permission of Client.
- j. Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However, tapings from an earth bus may be done.
- k. The entire installation shall be subjected to the following tests before energization of installation including portable equipment:
 - I. Insulation resistance test.
 - II. Polarity test of switches.
 - III. Earth continuity test.
 - IV. Earth electrode resistance.

The test procedures and their results shall conform to relevant standards.

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3.ELECTRICAL SHOCK:

Flow of electric current through human body is the cause of electrical shock. On receiving electrical shock a person may be bodily injured being thrown away on the same level or due to fall from height as he lose his balance when working at height. If electrical path is through heart, the accident can be fatal.

BURNS

- I. Burns are caused by electrical flashes if a body part comes with in flashing distance of high voltage current.
- II. Burns may be caused due to short circuit also.
- III. Short circuit may lead to electrical flashes causing burns
- IV. It is therefore important to adhere to all safety measures for prevention of Electrical hazards.
- V. Only authorized and qualified persons should undertake electrical repairs and other electrical works.
- VI. Treat all circuits are live unless ensured after testing to be DEAD
- VII. Use Standard switches sockets and other fittings of adequate rating required for the operation
- VIII. Use double insulated 3 core cables and ensures cables are free from insulation failure
- IX. All electrical supply is controlled through circuit breakers and the same is periodically checked by competent person for its effective operation.
- X. Ensure all electrical appliances and Electrical portable tools are effectively earthed.
- XI. Do not allow unsafe temporary connections, naked joints/wiring.
- XII. Don't work on electrical equipment's in wet environment /on wet floors.
- XIII. Don't over load electrical point/equipment.
- XIV. Don't crowd things near electrical mains /switches and keep access free from obstructions.
- XV. Don't make trail & errors and short cuts. Follow safe procedures.

4.INSTALLATION:

Following guidelines are provided for general observations:

- a. Only persons having valid wireman's license/competency certificate shall be employed for carrying out electrical work and repair of electrical equipment, installation and maintenance at site. A qualified licensed Supervisor shall supervise the job.
- b. Electrical equipment and installations shall be installed and maintained as to prevent danger from contact with live conductors and to prevent fires originating from electrical causes like short circuits, overheating etc. Installation shall not cause any hindrance to movement of men and materials.
- c. Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards.
- d. The minimum clearance to be maintained for all overhead lines along roads and across roads.
- e. Shall be as per the statutory requirements.
- f. Grounding conductor of wiring system shall be of copper or other corrosion resistant material. An extra grounding connection shall be made in appliances/equipment where chances of electric shock are high.
- g. Electric fuses and/or circuit breakers installed in equipment circuits for short circuit protection shall be of proper rating. It is also recommended that high rupturing capacity (HRC) fuses are used in all circuits. For load of 5 kW or more earth leakage circuit breaker shall be provided in the circuits.

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- h. Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables/wires and earthen effectively. Metallic poles as a general rule, shall be avoided and if used shall be earthen individually. Anti-climbing guards and danger notices shall be provided on poles. Each equipment shall be an individual isolating switch.
- i. Wires and cables shall be properly supported and an approved method of fixing shall be adopted. Loose hanging of wires and cables shall be avoided. Lighting and power circuits shall be kept distinct and separate.
- j. Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment, earthing etc.
- k. All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid underground, it shall be adequately protected by covering the same with bricks, Plain Cement Concrete (PCC) tile or any other approved means.
- l. Using suitable cable glands shall properly terminate all armored cables. Using cable lugs/sockets shall connect multi-stranded conductor cables. Cable lugs shall preferably be crimped. They shall be of proper size and shall correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- m. All cable glands, armoring and sheathing of electric cable, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.
- n. All the Distribution Boards, Switch Fuse Units, Bus bar chambers, ducts, cubicles etc. shall have MS enclosures and shall be dust, vermin and waterproof. The Distribution Boards switches etc. Shall be so fixed that they shall be easily accessible. Changes shall be done only after the approval of the Project Manager.
- o. The contractor shall provide proper enclosures/covers for protection of the entire switchboard, equipment etc. against rain. Exposed live parts of all electrical circuits and equipment shall be enclosed permanently. Crane trolley wires and other conductor which cannot be completely insulated shall be placed such that they are inaccessible under normal working conditions.
- p. Ironclad industrial type plug outlets are preferred for additional safety.
- q. Open type distribution boards shall be placed only in dry and ventilated rooms; they shall not be placed in the vicinity of storage batteries or otherwise exposed to chemical fumes.
- r. Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.
- s. In front of distribution boards a clear space of 90 cm shall be maintained in order to have easy access during an emergency.
- t. Adequate working space shall be provided around electrical equipment, which requires adjustment or examination during operation.
- u. As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in workroom where there is possibility of explosion hazard shall be explosion proof.
- v. All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulate, PVC sheathed twin/three/four core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system. Electric starter of motors, Switches shall not be mounted on wooden boards. Only sheet steel mounting or iron framework shall be used.

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- w. All the lighting fixtures and lap holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.
- x. Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weather proof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- y. The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakage. Only 24 V supply system shall be used for hand lamps etc. while working inside metallic tanks or conducting vessels.

1. GENERAL SAFETY RULES:

- I. All members of commissioning team and plant operation staff and general site staff must be given training on:
 - i. Safety during commissioning
 - ii. Fire protection system
 - iii. Emergency response
 - iv. First aid
 - v. Treatment for electric shock
- II. Combustible materials must be removed from the electrical plant area and kept in a separate special store, away from the main plant.
- III. Cable ways, ducts, air-conditioning ducts, floor openings must be closed and sealed. Fire barriers must be established.
- IV. Permanent fire detection and fire protection system must be in service before energizing cables and transformers
- V. Portable fire extinguishers must be kept ready in switch gear room and transformer room.
- VI. Station earthing system, equipment earthing, earthing of screens, doors, tanks, structures must be completed before energizing all subsystems.
- VII. Battery room ventilation system must be in operation at all times.
- VIII. Safety documentation system, work permit system must be established before energizing.
- IX. Total commissioning work must be planned and written. Protocol must be issued by the commissioning manager to the all concerned.
- X. The electrical energizing must be established as per protocol in steps of small manageable sections rather than larger systems at once.
- XI. Switchgear room must be kept clear of personnel and switching shall be operated from central control room by remote control.
- XII. Before proceeding to the next step, the healthiness of installations shall be observed visually by observers by taking the round. Abnormal sound, flashovers, instrument reading, vibrations, corona, heating marks, smoke if any must be informed immediately to the central control room by the observer taking the round.
- XIII. Before commissioning the tests control room must be vacated by unauthorized persons and only concerned authorized persons shall be allowed to enter the room
- XIV. Zones to be energized shall be cordoned by nylon ropes with flags indicating the sign " Testing in Progress"

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- XV. Switchgear room shall be vacated by outsiders. Firefighting equipment must be kept ready. Protocol for test must be signed by commissioning manager and Owner. Copies of protocol must be made available for all concerned. Instructions to operators if auxiliaries shall be given in Writing.

5.PORTABLE ELECTRICAL EQUIPMENT:

- a. Portable electrical equipment shall be regularly examined, tested and maintained to ensure that the equipment and its leads are in good order. Register shall be maintained for inspection, recording the testing dates and results of the equipment.
- b. All portable appliances shall be provided with three core cable and three pin plugs. The third pin of the plug shall invariably be earthen. It shall be ensured that the metal part of the Equipment shall be effectively earthen.
- c. All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wires in one length. No joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.
- d. Flexible cables for portable lamps, tools and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.

6.LOCK OUT & TAG OUT (LOTO) PROCEDURE:

- a. A safe lock out and tag out (LOTO) procedure shall be established prior to work on or near electrical equipment / lines, mechanic, pressure systems, and lines or equipment containing dangerous or hazardous material which can be energized, pressurized, activated, or released remotely or inadvertently.
- b. A safe lockout and tagging procedures is an operating procedures by which a person, action individually or as a member of a maintenance crew, may have a machine or part of a machine or equipment removed from and held out of service until released by that person. A tag indicating "Danger! Do not operate" or the equivalent shall be placed at the power source of the equipment being serviced.
- c. A safe lockout and tag out procedure shall be strictly followed in securing electrical systems, machinery, pressure systems, and rotating equipment.
- d. Power shall be turned off, tagged, and locked in the open position at the master switch or at the main breaker. Gears, agitators, or transmissions shall be mechanically locked out or disconnected.
- e. Padlocks shall be used and the person working on the equipment's shall be in possession of a key.
- f. A safe lockout and tagging procedure shall be required on all systems and equipment's if the unauthorized removal or return to service could result in injury, damage, or loss.
- g. Any required safe lockout and tagging procedures shall be included in an activity hazard plan. Safety meetings shall held to familiarize designed persons on the site with the procedure, including person responsibilities, and the system for safe lockout and tagging procedures. This shall include all signs, tags lockout, and other devices to be used.
- h. A lockout device that only accommodates one padlock shall not be used as the lockout may involve more than one system.

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- i. Padlocks and other accessories to be used shall be materially strong enough so that only excessive force or pressure can break them. Defective padlocks or accessories shall be immediately replaced.
- j. No key shall fit more than one lock.
- k. The person issued with a lock shall only be issued with one key. The spare key and the master key shall be held in a secure place by the supervisor and kept well apart from the primary lock and key storage box.
- l. Locks shall be distinctly numbered and no repetition of numbers allowed. Locks can, also be colour coded to identify the user's department (i.e. electrical, mechanical, etc.)
- m. The most basic form of safe lockout and tagging is given below- Removing the keys from vehicle ignition locks and placing warning signs instructing employees that the vehicle is under repair.
- n. Locking – off the power supply to equipment, such as carpentry machinery, to prevent unauthorized use or to ensure complete safety when repairing the machine and power supply point.
- o. Locking the doors and posting warning signs on areas or locations which present hazards to unauthorized personnel.
- p. After the switching operation has been performed, the switchmen shall, whenever possible, lockout the controller and /or attach Hold Tags as the case may be. The purpose of Lockouts and Hold Tags is to make sure the Controller remains open while work is being done and protect the personnel working on the portion of the system being protected by the controller.
- q. Hold Tags shall not be removed from any device unless authorized.
- r. Each disconnecting device shall be properly tagged with an approved Hold Tag.
- s. When Hold Tags cannot be attached to a device, they shall be attached at a conspicuous point, as close to the device as possible. In case of switchgear where Power Circuit Breakers are lowered or rolled out, the control, which would rise or roll the breaker to its operating position, shall be tagged.

After completion of the work, the craftsman shall then sign in the hold tag and return it back to the Supervising Operator who shall then directly supervise the removal of tags. The craftsman signing the hold tag shall be the same person who requested the hold tag. Unless responsibility transfers, both the Supervising Operator and the Craftsman shall follow the procedure for removal of lockout clips, chain and padlock.

7.TEMPORARY ELECTRICAL CONNECTION / EQUIPMENT:

a. GENERAL PROVISIONS:

- I. No person should be allowed to work on live circuit. The same, if unavoidable, special care and authorization need to be taken.
- II. Treat all circuits as "LIVE" unless ensured otherwise.
- III. Electrical "Tag Out" procedure "MUST" be followed for carrying out maintenance jobs.
- IV. Display voltage ratings prominently with "Danger" signs.
- V. Put caution/notice signs before starting the repair works.
- VI. All electrical equipment operating above 250 V shall have separate and distinct connections to earth grid.
- VII. Proper grounding to be ensured for all switch boards and equipment including Portable ones prior to taking into service.

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- VIII. Make sure that electrical switch boards, portable tools, equipment's (like grinding machine etc.) don't get wet during their usage. If it happens, stop the main supply, make the tools dry and then only use them. Check proper earthing.
- IX. Use only proper rated HRC fuses.
- X. All power supply cables should be laid properly and neatly so that they don't cause hindrance to persons working and no physical damage also takes place to the cables during various construction activities.
- XI. Don't lay un armoured cable directly on ground, wall, roof or trees. All temporary cables should be laid at least 750 mm below ground and cable markers should be provided. Proper sleeves should be provided at road crossings. In case temporary cables are to be laid on wooden poles/steel poles, the minimum cable heights should be 4.5 m.
- XII. Maintain safe overhead distance of HT cables as per Indian Electricity Rules and relevant acts.
- XIII. Don't make any unsafe temporary connections, naked joints/wiring etc.
- XIV. Fire extinguishers (DCP/CO2/Sand buckets) should be kept near temporary switch boards being used for construction purposes. Don't use water for fighting electrical fires.
- XV. Standard Insulating mats shall be provided in the front and back end of switch boards.
- XVI. Periodic checking/certification of electrical safety appliances such as gloves, insulating mats, hoods etc. to be done/witnessed along with maintaining a register at site signed by competent authority.
 - i. Prohibiting unauthorized persons from entering electrical equipment rooms or from handling or interfering with electrical apparatus.
 - ii. Specifying the person to be notified in case of electrical accident or dangerous occurrence, and indicating how to communicate with him.

b. INSPECTION AND MAINTENANCE:

- I. All electrical equipment should be inspected & tagged before taking into use to ensure suitability for its proposed use.
- II. Before any work is begun on conductors or equipment that does not have to remain live.

The current should be switched off by a responsible authorized person;

- i. Precautions should be taken to prevent the current from being switched on again;
- ii. The conductors or the equipment should be tested to ascertain that they are dead;
- iii. The conductors and equipment should be earthed and short-circuited;

Neighbouring live parts should be adequately protected against accident Contact.

- III. After work has been done on conductors and equipment, the current should only be switched on again on the orders of a competent person after the earthing and short-circuiting have been removed and the workplace reported safe.
- IV. Electricians should be provided with approved and tested tools, and personal protective equipment such as rubber gloves, mats etc.
- V. When work has to be done in dangerous proximity to live parts the current should be cut off. If for operational reasons this is not possible, the live parts should be fenced off or enclosed by qualified staff from the sub-station concerned.

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c. TESTING:

- I. Electrical installations should be inspected and tested & tagged once in quarter and the results recorded.
- II. Periodic testing of the efficiency of the earth leakage protective devices should be carried out.
- III. Particular attention should be paid to the earthing of apparatus, the continuity of protective conductors, polarity and insulation resistance, protection against mechanical damage and condition of connections at points of entry.

NOTE: A Residual Current Operated Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB), when installed, protects a human being to the widest extent. RCCB or ELCB should be provided as per Indian Electricity Rules.

8. SAFE WORKING DISTANCE IN ELECTRICAL HANDLING:

Voltage Range V	Minimum Safe Distance in mm
750 – 3,500	307
3,500 – 10,000	614
10,001 – 50,000	921
50,000 – 100,000	1535
100,001 – 250,000	3070

9. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding

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Name of Site :

Inspected By:

Date :

Sl. No.	POINTS	Observation	Measures
	CABLES		
1	Whether the condition of Cable is checked?		
2	Are Cables received from other site checked for Insulation Resistance before putting them into use?		
3	Are all main Cables, taken either underground / Overhead?		
4	Are welding Cables routed properly above the Ground?		
5	Are welding & Electrical Cables overlapping?		
6	Is any improper jointing of Cables wires prevailing at Site?		
	DBs / SDBs		
1	Is earth conductor continued upto DB / SDB?		
2	Whether DBs & extension boards are protected from rain / water?		
3	Is there any overloading of DBs / SDBs?		
4	Are correct / proper fuses & CB's provided at main boards & sub- boards?		
5	Is energised wiring in junction boxes, CB panels & similar places covered all times?		
	RCBO / RCCB		
1	Whether the connections are routed through RCBO / RCCB?		
2	Is RCBO/RCCB sensitivity maintained at 30 mA?		
3	Are the RCBO/RCCB numbered & tested periodically & test results recorded in a logbook countersigned by competent person?		
	EARTHING		
1	Is neutral earthing ensured at the source of power (Main DB at Gen. or Transformer)?		
2	Whether the continuity & tightness of earth conductor are checked?		
3	Mention the gauge of earth conductor used at site.		
4	Mention the value of Earth Resistance.		
	ELECTRICALLY OPERATED MACHINES / ACCESSORIES		
1	Whether the plug top provided everywhere?		
2	Are all metal parts of electrical equipment's & light fittings / accessories grounded?		
3	Is there any shed / cover for welding machines?		
4	Are Halogen lamps fixed at proper places?		
5	Are Portable power tools maintained as per norms?		
6	Any other Information		

Safety In-Charge

Electrical In-Charge

Doc. No. RESCO/HSE/F-37A/Rev.05 Annexure: 8.1 Date: 01.04.2022	ELECTRICAL SAFETY INSPECTION CHECKLIST	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Name of Site :
Inspected By :
Date :

Sl. No.	POINTS	Observation	Measures
	CABLES		
1	Whether the condition of Cable is checked?		
2	Are Cables received from other site checked for Insulation Resistance before putting them into use?		
3	Are all main Cables, taken either underground / Overhead?		
4	Are welding Cables routed properly above the Ground?		
5	Are welding & Electrical Cables overlapping?		
6	Is any improper jointing of Cables wires prevailing at Site?		
	DBs / SDBs		
1	Is earth conductor continued upto DB / SDB?		
2	Whether DBs & extension boards are protected from rain / water?		
3	Is there any overloading of DBs / SDBs?		
4	Are correct / proper fuses & CB's provided at main boards & sub- boards?		
5	Is energised wiring in junction boxes, CB panels & similar places covered all times?		
	RCBO / RCCB		
1	Whether the connections are routed through RCBO / RCCB?		
2	Is RCBO/RCCB sensitivity maintained at 30 mA?		
3	Are the RCBO/RCCB numbered & tested periodically & test results recorded in a logbook countersigned by competent person?		
	EARTHING		
1	Is neutral earthing ensured at the source of power (Main DB at Gen. or Transformer)?		
2	Whether the continuity & tightness of earth conductor are checked?		
3	Mention the gauge of earth conductor used at site.		
4	Mention the value of Earth Resistance.		
	ELECTRICALLY OPERATED MACHINES / ACCESSORIES		
1	Whether the plug top provided everywhere?		
2	Are all metal parts of electrical equipment's & light fittings / accessories grounded?		
3	Is there any shed / cover for welding machines?		
4	Are Halogen lamps fixed at proper places?		
5	Are Portable power tools maintained as per norms?		
6	Any other Information		

Safety In-Charge

Electrical In-Charge

Doc No.: IGESL/HSE/F-38/Rev.05 Annexure No: 8.2 Date : 01.04.2022	GRINDING MACHINE INSPECTION CHECKLIST	INOXGreen ENERGY SERVICES LIMITED
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NAME OF SITE:				Date:	
Identification No:					
S.NO.	Equipment/machine checks	OK	NOT OK	REMARKS	
1	Condition of body covers / Electrical Insulation				
2	Provision of Wheel-guard				
3	Provision of three core Electrical cable				
4	Colored insulation of the internal wires not showing from outside				
5	Card grip holding the outer covering (Sheath) of the cable tightly				
6	Cable free from signs of damage (Cuts or abrasion)				
7	Provision of Earthing				
8	Provision of Electrical Plug Top				
9	Outer covering (Sheath) of the cable tightly gripped where it enters the Plug				
10	Wheel RPM matching with machine RPM				
11	Availability of Face Shield/Safety Goggles and Gloves for grinder				
12	Side Handle is in position.				
13	Machine Dead man switch available.				
14	Grinding Wheel tightening key is available.				
		INSPECTED BY		REVIEW BY	
NAME					
DESIGNATION					
SIGNATURE					

Doc No.: RESCO/HSE/F-38A/Rev.05 Annexure No: 8.2 Date : 01.04.2022	GRINDING MACHINE INSPECTION CHECKLIST	RESCO GLOBAL WIND SERVICES PVT. LTD.
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NAME OF SITE:			Date:	
Identification No:				
S.NO.	Equipment/machine checks	OK	NOT OK	REMARKS
1	Condition of body covers / Electrical Insulation			
2	Provision of Wheel-guard			
3	Provision of three core Electrical cable			
4	Colored insulation of the internal wires not showing from outside			
5	Card grip holding the outer covering (Sheath) of the cable tightly			
6	Cable free from signs of damage (Cuts or abrasion)			
7	Provision of Earthing			
8	Provision of Electrical Plug Top			
9	Outer covering (Sheath) of the cable tightly gripped where it enters the Plug			
10	Wheel RPM matching with machine RPM			
11	Availability of Face Shield/Safety Goggles and Gloves for grinder			
12	Side Handle is in position.			
13	Machine Dead man switch available.			
14	Grinding Wheel tightening key is available.			
		INSPECTED BY		REVIEW BY
NAME				
DESIGNATION				
SIGNATURE				

Doc. No. IGESL/HSE/F-39/Rev.05 Annexure: 8.3 Date: 01.04.2022	Inspection Checklist for Discharge Rod/Earth Rod 11KV/33 KV/220 KV	
DISCRIPTION		DETAILS
Date of Inspection:		
Site Name:		
System Voltage : 11kv/ 33kv/220 Kv		
Make :		
Identification No. of Earth rod:		
Assembled Length :		
Locking system Connector push type /Pin type:		
Inner & Outer Dia of tube : 28mm -32mm/28mm-42mm/38mm-38mm		

SR. NO.	CHECK POINTS	OK	NOT OK	REMARKS
1	Earth rod body FRP condition:			
2	Length of Rod:			
3	Identification No./Marking available on Rod:			
4	Bottom section provided with rubber grip:			
5	Equipment standard as per IS 2071 tested/HV Tested 110 KV:			
6	Discharge Copper cable as per standard IS 694 (10 mm ²):			
7	Length of discharge cable is sufficient:			
8	Head Jaw Clamp - Aluminum earthing to grip 40mm dia conductor condition:			
9	Clamp & rod joint condition:			
10	Clamp condition free from corrosion:			
11	Earth rod is free from dust, oil , Grease:			
12	Crocodile grounding clamp condition:			
13	Aluminum head clamp is in good condition:			
14	Cable lug condition:			
15	Locking mechanism of rod:			
16	Over all condition:			

Inspected By (Name & Sign.): _____

Signature of Safety in Charge

Signature of Electrical/HT in Charge

Doc. No. RESCO/HSE/F-39A/Rev.05 Annexure: 8.3 Date: 01.04.2022	Inspection Checklist of Discharge Rod/Earth Rod 11 KV/33 KV/220 KV	RESCO GLOBAL WIND SERVICES PVT. LTD.		
DISCRIPTION		DETAILS		
Date of Inspection:				
Site Name:				
System Voltage : 11kv/ 33kv/220 Kv				
Make :				
Identification No. of Earth rod:				
Assembled Length :				
Locking system Connector push type /Pin type:				
Inner & Outer Dia of tube : 28mm -32mm/28mm-42mm/38mm-38mm				

SR. NO.	CHECK POINTS	OK	NOT OK	REMARKS
1	Earth rod body FRP condition:			
2	Length of Rod:			
3	Identification No./Marking available on Rod:			
4	Bottom section provided with rubber grip:			
5	Equipment standard as per IS 2071 tested/HV Tested 110 KV:			
6	Discharge Copper cable as per standard IS 694 (10 mm ²):			
7	Length of discharge cable is sufficient:			
8	Head Jaw Clamp - Aluminum earthing to grip 40mm dia conductor condition:			
9	Clamp & rod joint condition:			
10	Clamp condition free from corrosion:			
11	Earth rod is free from dust, oil , Grease:			
12	Crocodile grounding clamp condition:			
13	Aluminum head clamp is in good condition:			
14	Cable lug condition:			
15	Locking mechanism of rod:			
16	Over all condition:			

Inspected By (Name & Sign.): _____

 Signature of Safety in Charge

 Signature of Electrical/HT in Charge

Site Name :				
Machine S. No.			DATE:	
S.NO.	Equipment/machine checks	OK	NOT OK	REMARKS
1	Visual check of switches, speed control, and reverse gear mechanism are in sound condition and functioning.			
2	Visually check that all motor guards are fixed and that the blower attachment device is secure and in sound condition.			
3	Visually check that the shoulder strap attachment is in sound condition.			
4	Visually check that the vacuum bag and attachments if fitted are in sound condition.			
5	Check availability and condition of personal protective equipment .			
6	Ensure that appropriate PPE'S (Goggles, earplugs, hand gloves, mask)			
7	Visually check that all electric switches cables and extension cords are RCD protected (tagged).			
8	Conduct close inspection for damage to switch gear . Test operation of switch gear (proper function of switch controls).			
9	Check condition of vacuum blower reverse switching mechanism and repair or replace if damaged.			
10	Clear away all foreign material from inside and around motor housings and guards, etc.			
11	Visually check anti-vibration rubber buffers (if fitted) are in sound condition.			
12	Lubricate lightly according to manufacturer's specification.			
13	Other:			
INSPECTED BY		REVIEW BY		
NAME				
DESIGNATION				
SIGNATURE				

Doc No.: RESCO/HSE/F-40A/Rev.05 Annexure : 8.4 Date : 01.04.2022	HEALTH SAFETY & ENVIRONMMNET Air Blower Inspection Checklist	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Site Name :				
Machine S. No.			DATE:	
S.NO.	Equipment/machine checks	OK	NOT OK	REMARKS
1	Visual check of switches, speed control, and reverse gear mechanism are in sound condition and functioning.			
2	Visually check that all motor guards are fixed and that the blower attachment device is secure and in sound condition.			
3	Visually check that the shoulder strap attachment is in sound condition.			
4	Visually check that the vacuum bag and attachments if fitted are in sound condition.			
5	Check availability and condition of personal protective equipment .			
6	Ensure that appropriate PPE'S (Goggles, earplugs, hand gloves, mask)			
7	Visually check that all electric switches cables and extension cords are RCD protected (tagged).			
8	Conduct close inspection for damage to switch gear . Test operation of switch gear (proper function of switch controls).			
9	Check condition of vacuum blower reverse switching mechanism and repair or replace if damaged.			
10	Clear away all foreign material from inside and around motor housings and guards, etc.			
11	Visually check anti-vibration rubber buffers (if fitted) are in sound condition.			
12	Lubricate lightly according to manufacturer's specification.			
13	Other:			
INSPECTED BY		REVIEW BY		
NAME				
DESIGNATION				
SIGNATURE				

Doc No.: IGESL/HSE/F-41/Rev.05 Annexure: 8.5 Date : 01.04.2022	DRILLING MACHINE INSPECTION CHECKLIST	INOXGreen ENERGY SERVICES LIMITED
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Site Name:					
Machine S. No:			Date:		
S.NO	CHECK POINTS	YES	NO	REMARK	
1	From supply source to machine	Condition of incoming supply plug			
2		Condition of supply cable			
3		Size of supply cable matching with the supply current			
4		Is ELCB is fixed in switch board and is in working condition			
5		Condition of termination at machines terminals			
6	Machine	Condition of machine body			
7		Condition of handles, coverings etc			
8		Condition of Drilling machine safety cover			
9		Is body double insulated			
10		Any vibration/bearing noise accrue			
11		Condition of dead man switch			
12		Condition of check nut in drilling machine			
13		S. No marked clearly			
14	PPE	Grinding helmet with face shield worn			
15		Gloves worn			
16		Safety shoes worn			
17	Remarks if any				
Inspection Done By		Signature			
Designation					
Name of HSE person or site in charge or designated person		Signature			

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Site Name:					
Machine S. No:			Date:		
S.NO	CHECK POINTS		YES	NO	REMARK
1	From supply source to machine	Condition of incoming supply plug			
2		Condition of supply cable			
3		Size of supply cable matching with the supply current			
4		Is ELCB is fixed in switch board and is in working condition			
5		Condition of termination at machines terminals			
6	Machine	Condition of machine body			
7		Condition of handles, coverings etc			
8		Condition of Drilling machine safety cover			
9		Is body double insulated			
10		Any vibration/bearing noise accrue			
11		Condition of dead man switch			
12		Condition of check nut in drilling machine			
13		S. No marked clearly			
14	PPE	Grinding helmet with face shield worn			
15		Gloves worn			
16		Safety shoes worn			
17	Remarks if any				
Inspection Done By			Signature		
Designation					
Name of HSE person or site in charge or designated person			Signature		

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1. OBJECTIVE:

To adhere safety during commissioning in WTG.

2. ELECTRICAL TESTING & COMMISSIONING:

STEPS IN COMMISSIONING:

- a. Equipment Testing
- b. System Commissioning
- c. Observation and Trial
- d. Handing over to trained operating staff

3. EQUIPMENT TESTS:

The equipment tests for all equipment's are performed in accordance with the Site testing Plan. The purpose of the tests is to confirm proper site assembly, no transit damage, and proper functioning, all main and auxiliary connections have been correctly made and system operate safely and reliably.

Tests must not be avoided. Putting the equipment into operation without testing is very unsafe practice and serious lapse of construction management. Test results are compared with Factory test results to confirm the equipment has been transported and assembled correctly and it is in proper functioning state. While carrying out injection testing, large values of current is used. The Area shall be barricaded and the equipment has to be properly earthed. Skilled and experienced electricians are engaged for testing equipment's.

4. HIGH VOLTAGE TESTS:

- I. The voltage is applied initially for a fraction of second under close observation.
- II. After satisfying healthy installation, the voltage is applied for a little longer duration under close observation
- III. Relay panels, instrument panels, auxiliaries, outdoor yards are observed closely for flash-over, corona, noise, etc.
- IV. After ensuring no flash-over, tripping abnormal happening, the voltage is applied for a longer period.
- V. During commissioning, close observation of main circuit and subsystems is necessary for several hours / days as per field quality norms.
- VI. After loading, the bus bars and connectors shall be observed for hot spots if any. Corona spots shall be observed at night during darkness. Corrective actions must follow before trial operation.

5. OBJECTIVES OF COMMISSIONING RELATED WITH SAFETY:

- I. To check test and energize individual equipment, subsystems and auxiliaries in order of priority, part to whole, and to commission the total plant within scheduled time.
- II. To prove satisfactory and safe operation of all interlocking systems, sequence systems.
- III. To confirm correct settings of all protective systems.
- IV. To ensure coordination between protective systems
- V. To prove that protective systems discriminate correctly between normal and abnormal condition, protective zone boundaries.

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- VI. To prove stability of protective systems during permissible overloads, abnormal conditions / power swings / voltage dips etc.
- VII. To prove that circuit breakers operate correctly from control room commands, protective relay command during reduced control voltage.
- VIII. To prove fire protection system. Transformer shall not be energized till fire protection system is in service
- IX. To observe corona, sparks if any after energizing at high voltage. To take corrective action.
- X. To carryout load tests and check temperature rise of main equipment and bus bars, connectors (by remote sensors)
- XI. To confirm that equipment earthing systems complies with standard specifications.
- XII. To check the station earthing system for completeness and to test earth resistance.
- XIII. To test the lightening protection system for buildings and switch guards for completeness and correctness as per specifications
- XIV. To test the integrity of each storage battery cell as per specifications
- XV. To ensure that the auxiliary supply voltages are within specified limits of tolerance.

6. ESSENTIALS OF COMMISSIONING SAFETY:

- I. Commissioning must be carried out by expert team in association with operating personnel.
- II. Check all equipment, every auxiliary for correctness, completeness satisfactory test results and safety.
- III. Do not by pass interlocks, sequence systems, protective systems, safety systems, fire protection systems
- IV. Do not energize for regular operation unless all the systems are tested ok and protection and service systems are in service
- V. Do not proceed further until problems are resolved and corrective actions are completed.
- VI. Do not assume that the plant is safe until essential performance tests have been completed satisfactorily.

7. GENERAL SAFETY RULES FOR COMMISSIONING:

- XVI. All members of commissioning team and plant operation staff and general site staff must be given training on:
 - vi. Safety during commissioning
 - vii. Fire protection system
 - viii. Emergency response
 - ix. First aid
 - x. Treatment for electric shock
- XVII. Combustible materials must be removed from the electrical plant area and kept in a separate special store, away from the main plant.
- XVIII. Cable ways, ducts, air-conditioning ducts, floor openings must be closed and sealed. Fire barriers must be established.
- XIX. Permanent fire detection and fire protection system must be in service before energizing cables and transformers

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- XX. Portable fire extinguishers must be kept ready in switch gear room and transformer room.
- XXI. Station earthing system, equipment earthing, earthing of screens, doors, tanks, structures must be completed before energizing all subsystems.
- XXII. Battery room ventilation system must be in operation at all times.
- XXIII. Safety documentation system, work permit system must be established before energizing.
- XXIV. Total commissioning work must be planned and written. Protocol must be issued by the commissioning manager to the all concerned.
- XXV. The electrical energizing must be established as per protocol in steps of small manageable sections rather than larger systems at once.
- XXVI. Switchgear room must be kept clear of personnel and switching shall be operated from central control room by remote control.
- XXVII. Before proceeding to the next step, the healthiness of installations shall be observed visually by observers by taking the round. Abnormal sound, flashovers, instrument reading, vibrations, corona, heating marks, smoke if any must be informed immediately to the central control room by the observer taking the round.
- XXVIII. B
Before commissioning the tests control room must be vacated by unauthorized persons and only concerned authorized persons shall be allowed to enter the room
- XXIX. Zones to be energized shall be cordoned by nylon ropes with flags indicating the sign " Testing in Progress"
- XXX. Switchgear room shall be vacated by outsiders. Firefighting equipment must be kept ready. Protocol for test must be signed by commissioning manager and Owner. Copies of protocol must be made available for all concerned. Instructions to operators if auxiliaries shall be given in Writing.

8.PORTABLE ELECTRICAL EQUIPMENT:

- e. Portable electrical equipment shall be regularly examined, tested and maintained to ensure that the equipment and its leads are in good order. Register shall be maintained for inspection, recording the testing dates and results of the equipment.
- f. All portable appliances shall be provided with three core cable and three pin plug. The third pin of the plug shall invariably be earthen. It shall be ensured that the metal part of the Equipment shall be effectively earthen.
- g. All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using 3 core double insulated PVC flexible copper wires in one length. No joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.
- h. Flexible cables for portable lamps, tools and apparatus shall be regularly examined, tested periodically and maintained to ensure safety.

9.LOCK OUT & TAG OUT (LOTO) PROCEDURE:

- t. A safe lock out and tag out (LOTO) procedure shall be established prior to work on or near electrical equipment / lines, mechanic, pressure systems, and lines or equipment containing dangerous or

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hazardous material which can be energized, pressurized, activated, or released remotely or inadvertently.

- u. A safe lockout and tagging procedures is an operating procedures by which a person, action individually or as a member of a maintenance crew, may have a machine or part of a machine or equipment removed from and held out of service until released by that person. A tag indicating "Danger! Do not operate" or the equivalent shall be placed at the power source of the equipment being serviced.
- v. A safe lockout and tag out procedure shall be strictly followed in securing electrical systems, machinery, pressure systems, and rotating equipment.
- w. Power shall be turned off, tagged, and locked in the open position at the master switch or at the main breaker. Gears, agitators, or transmissions shall be mechanically locked out or disconnected.
- x. Padlocks shall be used and the person working on the equipment's shall be in possession of a key.
- y. A safe lockout and tagging procedure shall be required on all systems and equipment's if the unauthorized removal or return to service could result in injury, damage, or loss.
- z. Any required safe lockout and tagging procedures shall be included in an activity hazard plan. Safety meetings shall held to familiarize designed persons on the site with the procedure, including person responsibilities, and the system for safe lockout and tagging procedures. This shall include all signs, tags lockout, and other devices to be used.
- aa. A lockout device that only accommodates one padlock shall not be used as the lockout may involve more than one system
- bb. Padlocks and other accessories to be used shall be materially strong enough so that only excessive force or pressure can break them. Defective padlocks or accessories shall be immediately replaced.
- cc. No key shall fit more than one lock.
- dd. The person issued with a lock shall only be issued with one key. The spare key and the master key shall be held in a secure place by the supervisor and kept well apart from the primary lock and key storage box.
- ee. Locks shall be distinctly numbered and no repetition of numbers allowed. Locks can, also be colour coded to identify the user's department (i.e. electrical, mechanical, etc.)
- ff. The most basic form of safe lockout and tagging is given below- Removing the keys from vehicle ignition locks and placing warning signs instructing employees that the vehicle is under repair.
- gg. Locking – off the power supply to equipment, such as carpentry machinery, to prevent unauthorized use or to ensure complete safety when repairing the machine and power supply point.
- hh. Locking the doors and posting warning signs on areas or locations which present hazards to unauthorized personnel.
- ii. After the switching operation has been performed, the switchmen shall, whenever possible, lockout the controller and /or attach Hold Tags as the case may be. The purpose of Lockouts and Hold Tags is to make sure the Controller remains open while work is being done and protect the personnel working on the portion of the system being protected by the controller.
- jj. Hold Tags shall not be removed from any device unless authorized.
- kk. Each disconnecting device shall be properly tagged with an approved Hold Tag.
- ll. When Hold Tags cannot be attached to a device, they shall be attached at a conspicuous point, as close to the device as possible. In case of switchgear where Power Circuit Breakers are lowered or rolled out, the control, which would rise or roll the breaker to its operating position, shall be tagged.

After completion of the work, the craftsman shall then sign in the hold tag and return it back to the Supervising Operator who shall then directly supervise the removal of tags. The craftsman signing the hold

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tag shall be the same person who requested the hold tag. Unless responsibility transfers, both the Supervising Operator and the Craftsman shall follow the procedure for removal of lockout clips, chain and padlock.

10. TEMPORARY ELECTRICAL CONNECTION / EQUIPMENT:

b. GENERAL PROVISIONS:

- I. No person should be allowed to work on live circuit. The same, if unavoidable, special care and authorization need to be taken.
 - II. Treat all circuits as "LIVE" unless ensured otherwise.
 - III. Electrical "Tag Out" procedure "MUST" be followed for carrying out maintenance jobs.
 - IV. Display voltage ratings prominently with "Danger" signs.
 - V. Put caution/notice signs before starting the repair works.
 - VI. All electrical equipment operating above 250 V shall have separate and distinct connections to earth grid.
 - VII. Proper grounding to be ensured for all switch boards and equipment including Portable ones prior to taking into service.
 - VIII. Make sure that electrical switch boards, portable tools, equipment's (like grinding machine etc.) don't get wet during their usage. If it happens, stop the main supply, make the tools dry and then only use them. Check proper earthing.
 - IX. Use only proper rated HRC fuses.
 - X. All power supply cables should be laid properly and neatly so that they don't cause hindrance to persons working and no physical damage also takes place to the cables during various construction activities.
 - XI. Don't lay un armoured cable directly on ground, wall, roof or trees. All temporary cables should be laid at least 750 mm below ground and cable markers should be provided. Proper sleeves should be provided at road crossings. In case temporary cables are to be laid on wooden poles/steel poles, the minimum cable heights should be 4.5 m.
 - XII. Maintain safe overhead distance of HT cables as per Indian Electricity Rules and relevant acts.
 - XIII. Don't make any unsafe temporary connections, naked joints/wiring etc.
 - XIV. Fire extinguishers (DCP/CO2/Sand buckets) should be kept near temporary switch boards being used for construction purposes. Don't use water for fighting electrical fires.
 - XV. Standard Insulating mats shall be provided in the front and back end of switch boards.
 - XVI. Periodic checking/certification of electrical safety appliances such as gloves, insulating mats, hoods etc. to be done/witnessed along with maintaining a register at site signed by competent authority.
- iii. Prohibiting unauthorized persons from entering electrical equipment rooms or from handling or interfering with electrical apparatus.
 - iv. Specifying the person to be notified in case of electrical accident or dangerous occurrence, and indicating how to communicate with him.

c. INSPECTION AND MAINTENANCE:

- VI. All electrical equipment should be inspected & tagged before taking into use to ensure suitability for its proposed use.
- VII. Before any work is begun on conductors or equipment that do not have to remain live.

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The current should be switched off by a responsible authorized person;

- iv. Precautions should be taken to prevent the current from being switched on again;
- v. The conductors or the equipment should be tested to ascertain that they are dead;
- vi. The conductors and equipment should be earthed and short-circuited;

Neighbouring live parts should be adequately protected against accident Contact.

- VIII. After work has been done on conductors and equipment, the current should only be switched on again on the orders of a competent person after the earthing and short-circuiting have been removed and the workplace reported safe.
- IX. Electricians should be provided with approved and tested tools, and personal protective equipment such as rubber gloves, mats etc.
- X. When work has to be done in dangerous proximity to live parts the current should be cut off. If for operational reasons this is not possible, the live parts should be fenced off or enclosed by qualified staff from the sub-station concerned.

d. TESTING:

- IV. Electrical installations should be inspected and tested & tagged once in quarter and the results recorded.
- V. Periodic testing of the efficiency of the earth leakage protective devices should be carried out.
- VI. Particular attention should be paid to the earthing of apparatus, the continuity of protective conductors, polarity and insulation resistance, protection against mechanical damage and condition of connections at points of entry.

NOTE: A Residual Current Operated Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB), when installed, protects a human being to the widest extent. RCCB or ELCB should be provided as per Indian Electricity Rules.

11. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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1. BACKGROUND:

Safety while carrying out lifting and movement of heavy items of paramount importance for the Company. Every injury / illness / fatality will tarnish the image and reputation of the company besides the cost impact. So we do not leave any stone unturned in our attempt to implement the required safety measures at site. Competent manpower has been our greatest asset for our company and it is everyone's responsibility to ensure that each employee returns back home safely every day.

2. PURPOSE:

This document gives guidelines to Crane Dismantling, Transportation, Installation / Assembly, Operation, Inspection & Maintenance, Crane crew member's competency, vehicular movement of heavy items and PPE's. Copy of this guideline shall be distributed to Site safety representative/Administration offices/Vendor representatives.

3. OBJECTIVE:

The objective of this Guideline is to ensure safe lifting operation of materials as well as safe handling of heavy good movements.

4. CONTRACTOR'S STATUTORY REQUIREMENTS:

Before commencing the work, the crane vendor should be having and shall submit the copy of list of documents as mentioned below to the concerned department and update the same from time to time.

A. CRANE WORK

- a. Dress code at work place: Safety shoes, Safety helmet
- b. Personal protection equipment (PPE) application– Over and above the Standard / Basic Dress Code as indicated above.
 - Assembly / Dismantling : Dust mask, Goggles, Hand gloves.
 - Operation : Apron (Reflective)
 - Maintenance : Cotton Hand gloves, Electrical hand gloves appropriate capacity.
- c. Working at height
 - Safety belt, Access ladders
 - Cordoning off area with caution tape.
 - Direct supervision at work place
 - Follow work permit system for all the hazardous activity.
 - All PPE's shall be of Good quality and ISI/EN marked.

B. CRANE DOCUMENTS

- a. Tested by competent person, licensed driver/Operator, Trained rigger, Speed limit 15kmph, designated supervisor for loading / lifting plans.
- b. Such testing and checking shall be signed off by a competent person and documented. Such document shall be maintained in the crane.

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C. LIFTING TOOLS & TACKLES

Tested slings and tackles, Capacity identification, Storage Rack (Slings, chain pulley blocks, winches, pull lifts, wire ropes, manila /coir ropes, D shackles, etc.)

D. INCIDENT REPORTING

Near miss incident / Non-reportable / Reportable incident should be reported to concerned Supervisor / Engineer/ EHS Department.

E. ACTIVITY: LIFTING BY CRANE

Hazards are: Overhead power lines, Falling objects, Collision with Obstacles, breaking of boom slings / boom, overturning of the cranes, structural failure.

- a. Ensure safe distances from nearby overhead LT/HT/EHT line crossing / Line clearance and aware to all crew members
- b. Ensure the crane is on a firm / stable surface and level; survey area for dismantling.
- c. Ensure safe wind speed then start the boom down activity.(Max.10 m/sec)
- d. Ensure and verify functioning of all operational and safety features of crane. If any deviation occurring take corrective and preventive action then start the activity.
- e. Ensure crane hook (with or without slings/jigs) fully released / detached from WEC.
- f. Ensure proper signal code followed by rigger and operator.
- g. Ensure that all personnel who are assigned to Dismantling crane booms strictly follow the manufacturer's Dismantling procedures and use blocking to support all boom sections, Jib, hook block etc.,(Along the length)
- h. Remove sensitive components like aviation light and wind sensors from upper boom/jib before starting of dismantling activity and keep it safe location.
- i. The crane components should be dismantled in the correct sequence, using appropriate tools and equipment according to the prescribed procedures.
- j. Remove wire rope safely from sheave & wind into cable drum without twist. Proper signal followed by rigger and operator.
- k. Special care to be taken by riggers while pulling of wire rope from sheave and hoisting into cable drum.
- l. While walking along boom structure top side (Horizontal position) the rigger shall be taken special precaution for his movement.
- m. Select appropriate capacity cranes for dismantling of main crane components.
- n. Operators should know the weight details of crane components being handled. (Verify crane manual, load chart).
- o. Rigger should know sling lifting point on the lattice structure/crane components. Tag lines shall be used to prevent dangerous swing or spin of materials when raised/lowered.
- p. Ensure all connecting pins, studs etc., shall be properly removed from the boom structures/components.
- q. Dismantled the hook block, jib & boom sections from the main crane and kept in appropriate storage places/trailers.

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- r. Gantry shall be lowered to the rear and stowed flat.
- s. Remove the Counterweight one by one with the help of supporting crane. Never go/stand under a suspended load.
- t. While Crawler (Chain) dismantling ensures outriggers in all sides are fully extended and properly seated on floor and ensure firm / stable level. (Provide wooden, metallic pads).

F. CRANE DISMANTLING: (Additional points for Wheel mounted Lattice/Telescopic boom)

- a. Ensures outriggers in all sides are fully extended and properly seated on floor and ensure firm /stable level. (Provide wooden, metallic pads).
- b. Ensure wheels are not in contact with floor.

G. TRANSPORTATION

Crawlers lattice boom

- a. Main Crane components (Boom structures, Counter weights, Hook block, crawlers, car body etc.,) shall be properly loaded on appropriate capacity trailers by using appropriate capacity cranes.
- b. Ensure weight details of crane components being lifted (verify crane manual, load charts)
- c. Use appropriate capacity web slings for tying the crane components on the loaded trailers in appropriate places. (Shall be tied over the structures/components to prevent the movement / slippage from the trailers while transporting).
- d. Speed of the trailers shall be Max 30 KMPH while transportation and shall be strictly followed.
- e. The assistance of a trained and authorized signaller should be available, when the view of the driver is restricted.
- f. When crane components loaded trailers is required to cross/move in dangerous proximity of live electrical conductors, adequate precautions should be taken, such as isolating the electrical supply or erecting overhead barriers of a safe height.(Consult concern engineers)
- g. While transportation in night hours parking lights/Warning lights/tail lights should be put on.
- h. Preventive measures should be taken to avoid the fall of vehicles into excavations. Keep at least 1 meter away from edge of excavated pit.

a. Uphill area

- Appropriate capacity puller shall be used for critical movement of trailers.
- Puller shall be having adequate capacity counter weights; counter weights shall be properly loaded.
- Ensure Puller end shall be properly connected to the trailer end with appropriate capacity wire rope slings.
- Ensure proper communication between puller and loaded trailer. (Use walkie-talkie, mobile phone etc.).
- Signal code shall be properly followed.

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H. MOBILE CRANES LOAD TRAVELS

Wheel mounted Telescopic boom

- a. Securing outriggers (both hydraulic and manual) with a locking device specified by the crane manufacturer, and stowing them in a travelling position to ensure that there is no lateral movement.
- b. Storing loose components in appropriate storage areas in accordance with the crane manufacturer's instructions for the safe carriage of loads on road.
- c. Disengaging all drives to hydraulic pumps, booms and outriggers, and putting the controls in the OFF position.
- d. Restraining the boom in accordance with the crane manufacturer's instructions to ensure there is no unintended movement of the boom.

I. ASSEMBLY OF CRANE (Crawlers lattice boom)

- a. Survey and measure the area for crane assembly.
- b. Ensure safe distances from nearby overhead LT/HT/EHT line crossing/Line clearance and aware to all crewmembers.
- c. Verify the presence of underground pit, sump or cavity caused by water erosion.
- d. Verify the presence of superficial sewage line, telephone line or water pipe line.
- e. Ensure the crane is on a firm / stable surface and level.
- f. Measure safe distance from WEC foundation and position the crane.
- g. Select appropriate capacity cranes for car body assembly.
- h. Fully extend the outrigger & stabilize. In case of muddy or sandy ground utilize wooden or metallic pads.
- i. The crane components should be assembled in the correct sequence, using appropriate tools and equipment according to the prescribed assembly procedures.
- j. Select appropriate capacity cranes and safety precaution while assembly of Crawlers, Counter weights, Main boom, jib, and hook block, etc
- k. Ensure that all personnel who are assigned to Assemble crane booms strictly follow the manufacturer's Assemble procedures and use blocking to support all boom sections, Jib, hook block etc.,(Along the length)
- l. Check tightness of connecting pin, studs in the main boom, jib, hook block etc.
- m. Take special Safety precaution while wire rope hoisting. (Cable drum to Hook). Appropriate signal code shall be followed by operator and slinger.
- n. While walking along boom structure top side (Horizontal position) the rigger shall be taken special precaution for his movement.
- o. Check and ensure availability and tightness of aviation light and wind sensors in the upper boom/jib.
- p. Check for oil and engine fluid leakage (Hydraulic, Diesel, cooling fluid)
- q. Don't verify fluid leakage illuminating with open flame (Diesel, oil etc.)
- r. Ensure and verify functioning of all operational and safety features of crane. If any deviation occurring take corrective and preventive action then start the activity.
- s. Ensure safe wind speed then start the boom up activity (Max. 10 m/sec).
- t. Crane shall be placed in appropriate operating radius.

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J. CRANE ASSEMBLY(Wheel mounted Lattice / Telescopic boom)

- a. Ensures outriggers in all sides are fully extended and properly seated on floor and ensure firm /stable level. (Provide wooden, metallic pads).
- b. Ensure wheels are not contact with floor.

Caution

- a. Any increase in the attachments weight to boost strength causes the crane's centre of gravity to shift further to the front, with a resulting loss of stability.
- b. Structural failure (Breakage / Bend) occurs when the crane part is subjected to excessive stress/load (Tension, Torsion, Twisting etc.)

K. START-UP & OPERATION

- a. Before taking the crane into operation, verify the working of all safety related systems, including limit switches, alarm systems, smooth movements of all parts, etc.
- b. The maximum acceptable load and the last test details / results should be posted on the crane.
- c. Before lifting fully extend the outriggers (Tyre mounted crane) and ensure the stability of the ground.
- d. Ensure that the load does not exceed the crane's rated capacity.
- e. Never abruptly swing or stop the crane.
- f. While lifting ensure safe wind speed.
- g. Authorized signal man only gives signal to operator .Ensure sufficient communication devices availability.
- h. Use always crane hook with safety latch.
- i. The crane should not be operated with the boom at an angle less than that shown in the load chart.
- j. Raise load few inches, hold, verify capacity / balance, and test brake system before delivering load.
- k. When lifting vertically, the load shall be shared equally; the centre of gravity is placed equally between the pick points.
- l. The load must be lowered with attention and verify the stability before remove the slings.
- m. People can be crushed by the scissor like action of the upper rotating on the lower part while swinging, turning. Stay away from rotating cranes
- n. People can be crushed by the rear counterweights when there is not enough space to swing. Stay away from rotating cranes
- o. Never permit anyone to ride on loads, slings, hooks, for any reason
- p. TWO BLOCKING: The load line (Main wire rope) can break if the hook contacts the end of hook block. This can result on falling of hoisted load from a height
- q. Carelessness , slippery floors , steps, tools trash can cause falls
- r. The wire rope shall be longer than the lowering distance and it is recommended to have two rounds intact on the wire drum duly locked. Otherwise it may cause the snapping of wire rope.
- s. Adjustments and repairing of crane shall not be undertaken during the hoisting operation or load under short period suspension.
- t. The operator shall be careful to handle the crane engine getting overheated. He shall take necessary precautions to ensure the crane engine condition is perfectly in order.

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L. LEAVING THE MACHINE

Leaving the machine unattended is dangerous. The crane operator shall ensure:

- a. Lower the load and boom if needed.
- b. Set swing brake; drum pawls, parking brakes to lock position. Set propel brakes on crawler cranes.
- c. Shutoff the engine. Place the function lock lever in shutdown position.

M. GENERAL INSPECTION

- a. Daily inspection to be carried out on all lifting tools and tackles & Crane components before use it.
- b. The below mentioned defects in wire rope slings shall not be used and shall be disposed immediately.
- c. Defects are : Broken wires, Bird cages, Kinks, Surface wires are worn by 1/3 or more, Change of diameter of wire rope slings, crushing, Rope stretch (Length of sling increased more than 150 mm from the actual length), Core protrusions and Damage from rust or corrosion /heat damage.
- d. The following deficiencies hook shall be disposed / replaced immediately:
 - If hook throat opening has increased by 15%
 - Load bearing point has been worn by 10%
 - Hook tip twisted by 10o or more.
 - Excessive damage, deformation and cracks.
 - Inoperative / missing hook latches.

Points for attention

- Use only suitable wire rope slings.
- Never use damaged wire rope slings.
- No temporary repairs on slings.
- During lifting, the Safe Working Load must not be exceeded.
- Regular inspections shall be conducted.
- If more than one wire rope sling is used in lifting, pay attention to the angle between the slings.
- Damaged, distorted and field welded hooks should not be used.
- Corrosion, bend, welding defects & small holes shall not be allowed in Lattice boom structure of Crane/Components. Consult competent authority and take appropriate action.
- Load striking the boom or boom striking an obstacle can cause the boom to collapse.

N. PLANNED CRANE INSPECTION & MAINTENANCE

a. Inspection classification

i. Initial Inspection:

- Prior to initial use, all new and altered cranes shall be inspected by qualified person to verify the compliance and record the details.
- Regular Inspection: Inspection procedure for cranes in regular service is divided in to two general classifications based on the intervals at which inspection should be performed.
- Frequent Inspection: Daily by a designated person
- Routine (Periodic) Inspection: Monthly or as specifically recommended by the manufacturer or

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qualified person.

II. Annual Inspection

- 10 Year Major Inspection
- Third party inspection (Testing) shall be carried out on crane and its components as per planned schedule.

b. Maintenance

Preventive Maintenance:

- A preventive maintenance shall be carried out based on the recommendations outlined in the crane manufacturer's manual.
- It is recommended that replacement parts obtained from the original equipment manufacturer.

O. CRANE CREW MEMBERS COMPETENCY

- Operators:** The "crane operator" is responsible for operating the crane correctly & safely. He shall be:
 - Holding valid license.
 - Age & qualification as prescribed in standard and norms.
 - Holding valid crane operation certificate
 - Familiar with hand signals for communication.
 - Appropriate training and experience in his field and having complete knowledge of the crane he is operating.
 - Passing medical examination (Vision, Hearing, and ability to distinguish colours, no evidence of having physical defects or emotional instability)
 - Ability to read write, comprehend, and use arithmetic and a load / capacity chart.
- Slinger:** The "slinger" is responsible for attaching and detaching the load to and from the crane.
 - Appropriate training on general safety lifting operation.
 - Be capable of selecting lifting gears suitable for the loads.
 - Liaise with the operator and direct the movement of the crane safely.
- Signalman:** The "slinger" is responsible for relaying the signal from the slinger to the crane operator.
 - Appropriate training on general safety lifting operation
 - Be able to direct the movement of the crane and loads.
- Others Crew members:** Other crew members are responsible for assembling /dismantling of crane components and Manual material handling.
 - Appropriate training on general safety lifting operation / assembly / dismantling / manual material handling.
 - Crew members have to correct any unsafe conditions of working or report the possible dangers to supervisor/crane operator
 - Crew members working around the crane must obey all warning signals and be alert to watch-out for their own safety.

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- Crew members shall be known proper installation sequence and rigging operations.

P. SAFETY MEASURES DURING LIGHTNING

- When lightning storms are generated and lightning bolts are expected, the following precautions are to be taken immediately.
 - Stop the work. Lower the hoisted load onto the ground. Lower the boom onto the ground.
 - Engage all brakes to arrest the machine movement and stop the engine.
 - Advise all the crew members to stay away from the surrounding area of the machine.
- When a lightning strike occurs check the Machine before operating it.
 - Ground the Machine using all safety measures.
 - Check the machine parts for burns and damage.
 - Check the operation of electrical devices and load safety device for performance.
 - Check each operating parameter for abnormality.

Q. INSPECTION

All cranes shall be subject to periodic and routine inspection to ensure good health of the same. Such inspection shall be done in the prescribed format.

- Pre Operational Inspection (Lattice Boom Mobile Crane): Annexure I
- Pre Operational Inspection (Telescopic Boom Mobile Crane): Annexure II
- Routine Inspection and Maintenance (Mobile Lattice / Telescopic): Annexure III
- Such inspection shall be done once in a week by site in charge.

R. STATUTORY REQUIREMENTS FOR CRANE

- Registration certificate
- Permit
- Fitness certificate/Load test certificate.
- Operator valid license
- Pollution certificate (Applicable only)
- Insurance documents

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5. SAFETY GUIDELINES DURING MOVEMENT OF HEAVY VEHICLES AT WIND SITE:

Sr. No.	Activity	Potential Hazard and Associated Risk	Control Measures
A)	Vehicular Movement & Transfer the heavy machinery like nacelle, Tower segments, Transformers& Other transported Materials for wind sites.	A. Crossing the speed limit/Accident may occur leading to personal injury and damage to the vehicle.	a. Obey speed limits and traffic rules strictly(15 KMPH) b. Always expect the unexpected and be a defensive driver. c. Blow horn at the intersections, turning and during overtaking operations. d. Maintain the vehicle in good condition (ensure periodic maintenance). e. Do not overtake on curves, bridges and slopes.
		B. Adverse weather conditions / Accident may occur leading to personal injury and damage to the vehicle.	a. Read the road ahead and drive to leave. b. Keep the wind screen and lights clean. c. Do not turn at speed. d. Recognized the hazard, understand the defence and act in correctly in time.
		C. Consuming alcohol before and during the driving operation/accident may occur leading to personal injury and damage to the vehicle	a. Alcohol is strictly prohibited. b. Don't force the driver to drive fast and round the clock
B)	Overloading of Vehicle	A. Loss of control on steering/can cause wear and tears of tyres. B. Inadequacy breaks/damages road surfaces. C. Failure of components due to fatigue/decreases efficiency of the moving components of vehicle. D. Over turning while negotiating sharp bends/can cause accidents resulting to fatality	Vehicles should be loaded as per loading capacity specified by the manufacturer.
C)	While taking reverse	A. May hit the person	a. Proper provision of signal man with

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		working/damage material may cause minor/major injury personnel/loss of material	fluorescent jacket. b. Provision of reverse horn. c. Proper planning for positioning of access points and the routine of side roads should be consider. d. Suitable warning notices to be displayed at site entices. e. The provision of one way system and the avoidance of vehicle reversal is to be recommended on site
D)	Failure of breaks	A. May hit a person /property or personnel injury and damage to the property	a. Try to control the vehicle with the application of hand breaks and gears. b. Hit the vehicle to the fixed objects keeping the driver in safe position

6. POWER TO AMEND:

- a.** Any change of the manual shall be approved by the Head- GCHR.
- b.** The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Doc. No.: IGESL/HSE/F-42/ Rev. 05 Annexure: 10.1 Date: 01.04.2022	ENVIRONMENT HEALTH & SAFETY CRANE CHECK LIST	
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Name of Site :
 Inspected By :
 Date :

Sl. No.	Points	Observation	Measures
1	Hook and Hook Latch		
2	Over-Hoist Limit Switch		
3	Boom-Limit Switch		
4	Boom Angle indicator		
5	Boom-Limit cut-off switch		
6	Safe Load Indicator available		
7	Condition of boom		
8	Condition of Ropes		
9	No. of load lines		
10	Size and condition of the sling		
11	Stability of crane		
12	Soil Condition		
13	Swing Brake & Lock		
14	Propel Brake & Lock		
15	Hoist Brake & Lock		
16	Boom Brake & Lock		
17	Main clutch		
18	Leakage in hydraulic cylinders		
19	Hydraulic hose		
20	Out riggers fully extendible		
21	Tyre pressure		
22	Condition of Battery and Lamps		
23	Guards of moving and rotating parts		
24	Load chart provided		
25	No. and position of pendant ropes		
26	Automatic Reverse horn/Swing Alarm (With nominal sound frequency)		
27	Load test details		
28	Operators Fitness& Licence		
29	Fire Extinguisher in operators cabin		
30	Dedicated Helper available.		
31	Diesel tank and Diesel level		
32	Winch motor		
33	TPI Inspection		

This Crane has been checked for the above points and

Found **FIT** for deployment

☐

found **UNFIT** for deployment

☐

_____ (Site Engineer)

(Safety Officer) _____

Doc. No.: RESCO/HSE/F-42A/ Rev. 05 Annexure: 10.1 Date: 01.04.2022	ENVIRONMENT HEALTH & SAFETY CRANE CHECK LIST	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Name of Site :

Inspected By :

Date :

Sl. No.	Points	Observation	Measures
1	Hook and Hook Latch		
2	Over-Hoist Limit Switch		
3	Boom-Limit Switch		
4	Boom Angle indicator		
5	Boom-Limit cut-off switch		
6	Safe Load Indicator available		
7	Condition of boom		
8	Condition of Ropes		
9	No. of load lines		
10	Size and condition of the sling		
11	Stability of crane		
12	Soil Condition		
13	Swing Brake & Lock		
14	Propel Brake & Lock		
15	Hoist Brake & Lock		
16	Boom Brake & Lock		
17	Main clutch		
18	Leakage in hydraulic cylinders		
19	Hydraulic hose		
20	Out riggers fully extendible		
21	Tyre pressure		
22	Condition of Battery and Lamps		
23	Guards of moving and rotating parts		
24	Load chart provided		
25	No. and position of pendant ropes		
26	Automatic Reverse horn/Swing Alarm (With nominal sound frequency)		
27	Load test details		
28	Operators Fitness& Licence		
29	Fire Extinguisher in operators cabin		
30	Dedicated Helper available.		
31	Diesel tank and Diesel level		
32	Winch motor		
33	TPI Inspection		

This Crane has been checked for the above points and

Found **FIT** for deployment

☐

Found **UN FIT** for deployment

☐

_____ (Site Engineer)

(Safety Officer) _____

Doc. No.: IGESL/HSE/F-43 Rev. 05 Annexure: 10.2 Date: 01.04.2022	ENVIRONMENT HEALTH & SAFETY LIFT CHECK LIST	
WTG / Location no.:		
DATE-		
Service lift serial number:		
Type of arrester / Serial number:		
Type of hoist / Serial number & Working Hours :		
Name of the Company:		

Sl. No	Daily Check	✓	✗	Remarks
01	Check the Lift Fit to use / Calibration status; do not use the Lift if its date of calibration / Fit to use is expired.			
02	Check the Counter weights are in position and hoist counter weight should rotate during the lift travelling, there should not be any other objects to avoid the rotation.			
03	Check the Cable drum is in line with the Tower platform to guide the power cable during the lift travelling.			
04	Check the Guide rollers fitment and the condition of the Plastic rollers, there should not be any physical damage to the rollers.			
05	Check the Physical condition of the Wire ropes for any damages.			
06	Check the entire load bearing components for its proper fitment and torque conditions			
07	Check the flywheel working condition, this will be used in case of emergency			
08	Check the Function of the Governor.			
09	Check the No power Manual brake release function; this will be used in case of Emergency.			
10	Check the function of the Hoist brake in Upward & downward travel			
11	Check the Lift electrical Routing is done properly inside the lift, there should not be any loose wires inside the lifts.			
12	Checks the Green Light indication (L1) ready for operation, if Green light is not glowing, check all the possible errors in the Error indicator box as per the electrical drawings.			
13	Check the entire safety limit switches are in its appropriate position; there should not be any physical damage to the limit switch			
14	Check visually all the electrical switches, push buttons for its proper function			
15	During traveling always need to carry communication instruments for further communication			

Signature for site engineer

Site HOD

HSE Engineer

Doc No.: IGESL/HSE/F-44/ Rev.05 Annexure: 10.3 Date : 01.04.2022	CHECKLIST FOR VEHICULAR MOVEMENT	INOXGreen ENERGY SERVICES LIMITED
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Sr. No	Description	Status		
		Yes	No	N/A
1.	Job hazard Analysis/HIRA for Vehicle movement are ensured			
2.	Training & Pre-job briefing to work force			
3.	Use of P.P.Es (Helmet, Nose masks, Safety shoes, Hand gloves, Ear plug etc.)			
4.	Proper Warning signs being displayed.			
5.	Safety personnel & Competent Supervisor availability at all time of work.			
6.	Maintaining stable slopes for excavation & ensure proper angle of repose of loose rock in vertical cut face during excavation.			
7.	Adequate area lighting minimum 20 lux for general area and minimum 100 lux at work spot.			
8.	Condition monitoring of equipment-Driver cabin hood/canopy, horn, back view mirror, hydraulic system, tyre conditions, brakes, Headlights and backlights are ensured by tagging system.			
9.	Wetting of the area to minimize dust level during the operation of dumpers and excavators.			
10.	Keeping the roads free of any obstacles.			
11.	Use of hotter for 30sec before unloading the muck from the dumpers and cordoning off the excavated area with proper barricading.			
12.	Medical fitness and eye test certification of drivers and machinery operators.			
13.	Adequate and sufficient ladder provided for entry and exit.			
14.	Prevention for loose materials from falling into excavation.			
15.	Whether all vehicle inspected by the responsible person on weekly basis and inspection tag available on the vehicle			
16.	Whether reverse light and back horn are in working condition in all vehicles			

HSE Officer_____

Doc No.: RESCO/HSE/F-44/Rev.05 Annexure: 10.3 Date : 01.04.2022	CHECKLIST FOR VEHICULAR MOVEMENT	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Sr. No	Description	Status		
		Yes	No	N/A
1.	Job hazard Analysis/HIRA for Vehicle movement are ensured			
2.	Training & Pre-job briefing to work force			
3.	Use of P.P.Es (Helmet, Nose masks, Safety shoes, Hand gloves, Ear plug etc.)			
4.	Proper Warning signs being displayed.			
5.	Safety personnel & Competent Supervisor availability at all time of work.			
6.	Maintaining stable slopes for excavation & ensure proper angle of repose of loose rock in vertical cut face during excavation.			
7.	Adequate area lighting minimum 20 lux for general area and minimum 100 lux at work spot.			
8.	Condition monitoring of equipment-Driver cabin hood/canopy, horn, back view mirror, hydraulic system, tyre conditions, brakes, Headlights and backlights are ensured by tagging system.			
9.	Wetting of the area to minimize dust level during the operation of dumpers and excavators.			
10.	Keeping the roads free of any obstacles.			
11.	Use of hotter for 30sec before unloading the muck from the dumpers and cordoning off the excavated area with proper barricading.			
12.	Medical fitness and eye test certification of drivers and machinery operators.			
13.	Adequate and sufficient ladder provided for entry and exit.			
14.	Prevention for loose materials from falling into excavation.			
15.	Whether all vehicle inspected by the responsible person on weekly basis and inspection tag available on the vehicle			
16.	Whether reverse light and back horn are in working condition in all vehicles			

HSE Officer _____

Mfg:		Model:		Vendor:		Date:	
Check the appropriate box:		S=Satisfactory ;		U=Unsatisfactory ;		NA=Not Applicable	
Conditions		S	U	NA	Remarks		
FLUID LEVELS	1.Crankcase oil						
	2. Coolant						
	3. Hydraulic oil						
	4. Check for No deteriorations or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.						
CAB (S)	5. Electrical system						
	6. Service/Parking brake						
	7. Swing brake/House lock/Emergency stops						
	8. Gauges						
	9. House keeping						
	10. Fire extinguishers						
	11. Load chart/Operation manual						
	12. Windows/Mirrors						
	13. Travel						
	14. Steering						
FUNCTION NS	15. Outriggers						
	16. Boom Up/Down						
	17. Hoists Up/Down						
	18. Swing						
	19.Anti-Two block/Hoist limit switches						
OPERATION AL AIDS	20. LMI/Load Weight Indicator						
	21. Boom length Indicator						
	22. Boom Angle Indicator						
	23.Lights/Locks/buzzers						
	24.Boom kick-out						
	25. Back-up Alarm/Horn/Lights						
BOOMS, JIBS & ACCESSORIES	26. Load Block/Ball/Hook-Ensure No wear/cracks						
	27. Safety latches-Availability & condition						
	28. Wedge Sockets						
	29. Sheaves- Ensure No wear/cracks						
	30. Wire Rope Retainers						
	31. Main boom-No welding defects, cracks, pin holes, corrosion etc.						
	32. Jib/Extension						
LOWER WORKS	33. Tires/Crawlers						
	34.Carries/Car body						
	35.Shoes/Tracks/Chain						
	36.Machine guards						
	37. Hoists Brakes/Clutches						
	38. Hoses/Tubing						
UPPER	39.Hoists						
	40. Wrapping on drums- Proper spooling						
	41. Rope Revving						
	42.Gantries/Bridles						
	43. Wire rope: No crushing, kinking, broken wires, Worn, Bird cages, etc.,						
PPE	44.Crew members-Shoe, helmet ,etc.						

Operator (Name& Sign):

Supervisor (Name& Sign):

Doc. No. RESCO/HSE/F-45A/Rev.05 Annexure: 10.4 Date: 01.04.2022	Pre-Operational Inspection Checklist (Lattice Boom Mobile Crane)	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Mfg:	Model:	Vendor:	Date:		
Check the appropriate box:		S=Satisfactory ;	U=Unsatisfactory ;	NA=Not Applicable	
Conditions		S	U	NA	Remarks
FLUID LEVELS	1.Crankcase oil				
	2. Coolant				
	3. Hydraulic oil				
	4. Check for No deteriorations or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.				
CAB (S)	5. Electrical system				
	6. Service/Parking brake				
	7. Swing brake/House lock/Emergency stops				
	8. Gauges				
	9. House keeping				
	10. Fire extinguishers				
	11. Load chart/Operation manual				
	12. Windows/Mirrors				
	13. Travel				
	14. Steering				
FUNCTIONS	15. Outriggers				
	16. Boom Up/Down				
	17. Hoists Up/Down				
	18. Swing				
	19.Anti-Two block/Hoist limit switches				
OPERATIONAL AIDS	20. LMI/Load Weight Indicator				
	21. Boom length Indicator				
	22. Boom Angle Indicator				
	23.Lights/Locks/buzzers				
	24.Boom kick-out				
	25. Back-up Alarm/Horn/Lights				
BOOMS,JIBS & ACCESSORIES	26. Load Block/Ball/Hook-Ensure No wear/cracks				
	27. Safety latches-Availability & condition				
	28. Wedge Sockets				
	29. Sheaves- Ensure No wear/cracks				
	30. Wire Rope Retainers				
	31. Main boom-No welding defects, cracks, pin holes, corrosion etc.				
	32. Jib/Extension				
LOWER WORKS	33. Tires/Crawlers				
	34.Carries/Car body				
	35.Shoes/Tracks/Chain				
	36.Machine guards				
	37. Hoists Brakes/Clutches				
	38. Hoses/Tubing				
UPPER	39.Hoists				
	40. Wrapping on drums- Proper spooling				
	41. Rope Revving				
	42.Gantries/Bridles				
	43. Wire rope: No crushing, kinking, broken wires, Worn, Bird cages, etc.,				
PPE	44.Crew members-Shoe, helmet ,etc.				

Operator (Name& Sign):

Supervisor (Name& Sign):

Pre-Operational Inspection Checklist (Telescopic Boom Mobile Crane)

Mfg:		Model:		Vendor:		Date:	
Check the appropriate box: S=Satisfactory ; U=Unsatisfactory ; NA=Not Applicable							
Conditions		S	U	NA	Remarks		
FLUID LEVELS	1.Crankcase oil						
	2. Coolant						
	3. Hydraulic oil						
	4. Check for No deteriorations or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.						
CAB (S)	5. Electrical system						
	6. Service/Parking brake						
	7. Swing break/House lock/Emergency stops						
	8. Gauges						
	9. House keeping						
	10. Fire extinguishers						
	11. Load chart/Operation manual						
	12. Windows/Mirrors						
	13. Travel						
	14. Steering						
FUNCTIONS	15. Outriggers						
	16. Boom Up/Down						
	17. Boom In/Out						
	18. Hoists Up/Down						
	19. Swing						
	20.Anti-Two block/Hoist limit switches						
OPERATION AID	21. LMI/Load Weight Indicator						
	22. Boom length Indicator						
	23. Boom Angle Indicator						
	24. Radius Indicator						
	25. Warning lights/Buzzers						
	26. Back-up Alarm/Horn/Lights						
BOOMS, JIBS & ACCESSORIES	27. Load Block/Ball/Hook-Ensure No wear/cracks						
	28. Safety latches-Availability & condition						
	29. Wedge Sockets						
	30. Sheaves- Ensure No wear/cracks						
	31. Wire Rope Retainers						
	32. Main boom						
	33. Jib/Extension						
	34. Lift cylinder(s)						
LOWER WORKS	35. Tires						
	36. Carrier						
	37.Machine guards						
	38. Hoists Brakes						
	39. Hoses/Tubing						
UPPER Works	40.Hoists						
	41. Wrapping on drums- Proper spooling						
	42. Rope Revving						
	43. Wire rope: No crushing, kinking, broken wires, Worn, Bird cages, etc.,						
PPE	44. Crew members-Shoe, helmet ,etc.						

Operator (Name& Sign):

Supervisor (Name& Sign):

Doc. No. RESCO/HSE/F-46A/Rev.05 Annexure: 10.5 Date: 01.04.2022	Pre-Operational Inspection Checklist (Telescopic Boom Mobile Crane)	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Mfg:		Model:		Vendor:		Date:	
Check the appropriate box: S =Satisfactory ; U =Unsatisfactory ; NA =Not Applicable							
		Conditions	S	U	NA	Remarks	
FLUID LEVELS	1.Crankcase oil						
	2. Coolant						
	3. Hydraulic oil						
	4. Check for No deteriorations or leakage in lines, tanks, valves, drain pumps and other parts of air or hydraulic systems.						
CAB (S)	5. Electrical system						
	6. Service/Parking brake						
	7. Swing break/House lock/Emergency stops						
	8. Gauges						
	9. House keeping						
	10. Fire extinguishers						
	11. Load chart/Operation manual						
	12. Windows/Mirrors						
	13. Travel						
	14. Steering						
FUNCTIONS	15. Outriggers						
	16. Boom Up/Down						
	17. Boom In/Out						
	18. Hoists Up/Down						
	19. Swing						
	20.Anti-Two block/Hoist limit switches						
OPERATION AL AIDS	21. LMI/Load Weight Indicator						
	22. Boom length Indicator						
	23. Boom Angle Indicator						
	24. Radius Indicator						
	25. Warning lights/Buzzers						
	26. Back-up Alarm/Horn/Lights						
BOOMS,JIBS & ACCESSORIES	27. Load Block/Ball/Hook-Ensure No wear/cracks						
	28. Safety latches-Availability & condition						
	29. Wedge Sockets						
	30. Sheaves- Ensure No wear/cracks						
	31. Wire Rope Retainers						
	32. Main boom						
	33. Jib/Extension						
	34. Lift cylinder(s)						
LOWER WORKS	35. Tires						
	36. Carrier						
	37.Machine guards						
	38. Hoists Brakes						
	39. Hoses/Tubing						
UPPER	40.Hoists						
	41. Wrapping on drums- Proper spooling						
	42. Rope Revving						
	43. Wire rope: No crushing, kinking, broken wires, Worn, Bird cages, etc.,						
PPE	44. Crew members-Shoe, helmet ,etc.						

Operator (Name& Sign):

Supervisor (Name& Sign):

**Routine Inspection & Maintenance
Checklist
(Telescopic Boom Mobile Crane)**

Mfg:	Model:	Vendor:	Date:		
Check the appropriate box: S=Satisfactory ; U=Unsatisfactory ; NA=Not Applicable					
Conditions	S	U	NA	Remarks	
1. ALL FUNCTIONS & THEIR CONTROLS: Speed, Smoothness of operation, Limits of motion					
2.INSPECT ENTIRE CRANE FOR STRUCTURAL DAMAGE: Check for distortion or cracks in main frame, outrigger assemblies, and structural attachments of the upper works to the carrier.					
3. INSPECT ALL WELDED CONNECTIONS FOR CRACKS.					
4. Check for deformed, cracked, or corroded members in the load / stress bearing structure and entire boom.					
5. Inspect cracked or worn sheaves and drums.					
6.Check for Cracked crane hooks					
7. Inspect for worn, cracked, or distorted parts such as: pins, bearings, shafts, gears, rollers, locking devices, hook roller brackets, removable outrigger attachments lugs and welds, wire ropes, locking devices, and electrical contactors					
8. Inspect for excessive wear on brake and clutch system parts, linings, pawls, and ratchets.					
9. Inspect all indicators, including load and boom angle indicators, for proper operation and calibration					
10. Inspect for excessive wear on drive sprockets and chain stretch.					
11. Inspect for correct action of steering, braking, and locking devices.					
12. Inspect all hydraulic and pneumatic hoses, fittings, and tubing.					
13.Inspect all hydraulic and pneumatic pumps and motors					
14.Inspect all hydraulic and pneumatic valves					
15.Inspect all hydraulic and pneumatic cylinders					
16.Inspect all hydraulic filters & fluid levels					
17. Inspect all emergency & safety switches, interlocks, limiting & indicating devices.					
18. Inspect Lubrication of all moving parts.					
19.Lack of performance and compliance with safety requirements of gasoline, diesel, electric and other power plants.					
20. SIGNAGE-warning signs and control markings					
21. Excessively worn or damaged tires					
22. Check the identification number is permanently and legibly marked on jibs, blocks, equalizer beams, and all other accessories.					

Note:

1. Consult operator's manual for additional inspection items;
2. All replacement parts should be identical or equivalents to the original parts or components;
3. Do not operate the crane until unsafe conditions are corrected.

Operator (Name& Sign):

Supervisor (Name& Sign):

Doc. No. RESCO/HSE/F-47A/Rev.05 Annexure: 10.6 Date: 01.04.2022	Routine Inspection & Maintenance Checklist (Telescopic Boom Mobile Crane)	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Mfg:	Model:	Vendor:	Date:	
Check the appropriate box:		S=Satisfactory ;	U=Unsatisfactory ;	NA=Not Applicable
Conditions	S	U	NA	Remarks
1. ALL FUNCTIONS & THEIR CONTROLS: Speed, Smoothness of operation, Limits of motion				
2.INSPECT ENTIRE CRANE FOR STRUCTURAL DAMAGE: Check for distortion or cracks in main frame, outrigger assemblies, and structural attachments of the upper works to the carrier.				
3. INSPECT ALL WELDED CONNECTIONS FOR CRACKS.				
4. Check for deformed, cracked, or corroded members in the load / stress bearing structure and entire boom.				
5. Inspect cracked or worn sheaves and drums.				
6.Check for Cracked crane hooks				
7. Inspect for worn, cracked, or distorted parts such as: pins, bearings, shafts, gears, rollers, locking devices, hook roller brackets, removable outrigger attachments lugs and welds, wire ropes, locking devices, and electrical contactors				
8. Inspect for excessive wear on brake and clutch system parts, linings, pawls, and ratchets.				
9. Inspect all indicators, including load and boom angle indicators, for proper operation and calibration				
10. Inspect for excessive wear on drive sprockets and chain stretch.				
11. Inspect for correct action of steering, braking, and locking devices.				
12. Inspect all hydraulic and pneumatic hoses, fittings, and tubing.				
13.Inspect all hydraulic and pneumatic pumps and motors				
14.Inspect all hydraulic and pneumatic valves				
15.Inspect all hydraulic and pneumatic cylinders				
16.Inspect all hydraulic filters & fluid levels				
17. Inspect all emergency & safety switches, interlocks, limiting & indicating devices.				
18. Inspect Lubrication of all moving parts.				
19.Lack of performance and compliance with safety requirements of gasoline, diesel, electric and other power plants.				
20. SIGNAGE-warning signs and control markings				
21. Excessively worn or damaged tires				
22. Check the identification number is permanently and legibly marked on jibs, blocks, equalizer beams, and all other accessories.				

Note:

- 1. Consult** operator's manual for additional inspection items;
- 2.** All replacement parts should be identical or equivalents to the original parts or components;
- 3. Do not** operate the crane until unsafe conditions are corrected.

Operator (Name& Sign):

Supervisor (Name& Sign):

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	FIRE PREVENTION & EMERGENCY PREPAREDNESS	Guideline No IGESL SITE/HSE/011
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1. PREAMBLE:

It is an accepted fact that no matter how well a process is controlled and safeguarded by instruments and process safety procedures, it is inevitable that there is a residual risk, which is capable of causing a variety of emergencies. Such emergencies could be the result of malfunction or non-observance of operating instructions. It could at times, be the consequences of acts outside the control of people. Hence the need to prepare an ON-SITE EMERGENCY PLAN (OEP) for dealing with incidents which may still occur and are likely to affect Health, Safety, Life, Property and Environment both at site and in the immediate neighbourhood. An OEP mitigates effects of a major accident / emergency, when these effects are contained within the boundary of the site.

An emergency is a situation, which may cause serious injury, loss of life, damage to property, environmental pollution etc., due to major accident, fire / explosion or any other calamity.

This plan is guideline for employees, contractors, visitors etc., also informs about prompt rescue operations, medical treatment, co-ordination and communication among various internal & external members. For an OEP, speed is the essence. The plan should be such that it would avoid any confusion, panic during emergency at site.

2. OBJECTIVES:

The overall objectives of Fire Prevention and Emergency preparedness are:

- a. To control the emergency, localize it and if possible, terminate it
- b. To avoid confusion / panic and to handle the emergency with clear instructions
- c. To minimize the effects of the incidence on people and property and also to minimize the damage to the environment in and around our premises.
- d. To preserve records and take appropriate steps to prevent recurrence
- e. To restore normalcy.

3. SCOPE:

All site function including Project and O&M.

4. DEFINITIONS:

- a. **Emergency:** Undesired and imposed hazardous situation, which can cause LOSS in the form of injuries and property damage.
- b. **On-Site Emergency:** Emergency inside the site boundaries which demands the stoppage of all activities and total or partial evacuation.
- c. **Off-Site Emergency:** Emergency which spills outside the site boundaries and affects neighbouring areas and general public. Information to regulatory bodies and seeking help from them.

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- d. **Assembly Point:** Safe area for the assembly of persons requiring evacuation after accounting for the missing persons. This is done through a **Head count**.
- e. **Emergency Exits:** Passages and walkways leading to Assemble point.

5. FIRE PREVENTION:

- a. Electrical wiring equipment for heating, height on power shall be installed in compliance with statutory requirements.
- b. Internal combustion engine powered equipment shall be located with exhaust well away from combustible materials.
- c. Smoking is prohibited on the site.
- d. No smoking signboards shall be posted consciously at appropriate locations.
- e. Storage areas shall be free from accumulation of unnecessary combustible materials.
- f. Sufficient number of fire extinguishers shall be installed at all temporary buildings and storages.
- g. All flammable liquids, gas cylinders and other inflammable materials stored properly and separately.
- h. Flame cutting and welding take hot work permit.

6. PREVENTING THE SPREAD OF FIRE:

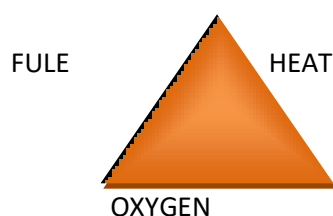
- a. Waste accumulation in hoist shafts etc will be regularly removed.
- b. Separate metal containers for oil rags, paint rags, paint scrapings, waste flammable liquids, wood warnings and off-cuts provided.
- c. All wastes will be regularly cleaned /cleared.

7. MEANS OF ESCAPE:

- a. All gangways, stairs, platforms shall be free from obstructions.
- b. Everyone on the site shall be trained and shown the way how to escape safely in an emergency (Emergency drills/Exercise shall be conducted periodically).

8. CLASSES OF FIRE:

- a. Not all Fires are the same. If you use wrong type of Fire Extinguisher on the wrong class of Fire, you can, in fact, make matters worse. It is therefore very important to understand the six different classes of Fires.
- b. As shown in the Fire Triangle module, if any of the components of the triangle (Heat, Oxygen, or Fuel) is removed from the fire then the fire will be extinguished.



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9. FIRE CLASSES:

	Class A - ordinary combustible or fibrous material such as wood, paper, fabric, coal, leather, sugar, rubber and some plastics.
	Class B - flammable liquids such as petrol, kerosene, alcohol, oil and paint thinners.
	Class C - Flammable Gasses such as LPG, Butane, Acetylene, Hydrogen, natural gas and methane.
	Class D - Combustible Metals: potassium, sodium, lithium, aluminium, magnesium and metal swarf. Fires of this class may occur in laboratories or industries that use these materials. Metal swarf fires may occur in machine shops where metal turning or milling is carried out. These fires burn at high temperatures and give off sufficient oxygen to support combustion. They may also react violently with water or other chemicals.

- If you have any wrong type of extinguisher on the wrong class of fire, you may make matter worse. For example if water is used to extinguish on Oil fire, the Oil may float on the water and spread the fire to other areas.
- Fires are normally classified according to the fuel involved; however any Fire that involves energized electrical equipment is always until the electrical circuit is disconnected. It is then reclassified according to the type of material that is burning.
- Most Fire extinguishers will have a pictograph label telling you which fuel the extinguisher are designed to fight. For example, a simple water extinguisher might have a label like the one below, indicating that it should only be used on **CLASS A** fuels and **NEVER** on **CLASS B** fuels (Flammable Liquids).



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10. IN CASE OF FIRE / EMERGENCY:

- a. Alert the persons nearby by shouting Fire! Fire! Fire!
- b. If there is a fire alarm system, activate fire alarm or inform any nearby person to do so. Or arrange to inform the Site in-charge / Project manager / Safety officer / other emergency response teams by available means (phone / messenger / walky talky etc.)
- c. Confirm the location, type & magnitude of fire / emergency.
- d. Try to extinguish the fire with available means (fire extinguishers, fire hoses etc.) from upwind direction, if the same can be done without endangering yourself.
- e. Guide the emergency response personnel with the information.
- f. Don't venture in to rumors spreading or unauthorized statements to outside agencies.
- g. Fire Scheme.

WHEN FIRE ALARM SOUNDS

Essential personnel

Persons, whose services may be required during emergency, shall report directly to the Site in-charge / Project manager or the person in-charge of response operations.

Non-essential personnel

- i. Stop work immediately.
- ii. Switch off all electrical equipment and welding machines.
- iii. Proceed immediately to assembly area.

Wait for further instructions from authorized personnel.

11. CAUSE OF CATCH FIRE AND PREVENTIVE MEASURES:

- a. Main causes of fire during projects may be summarized as;
 - I. Careless gas cutting / welding
 - II. Smoking
 - III. Throwing lighted matches
 - IV. Uncontrolled rubbish burning
 - V. Incorrect storage and careless use of flammable liquids and compressed gases
 - VI. Electrical sparks (loose cabling, wet electrical equipment etc.)
 - VII. Electrostatic discharges
- b. Main preventive / protective measures should be taken are
 - I. Nobody shall be allowed to misuse or horse play with the emergency equipment.
 - II. Demonstration on the usage of fire extinguishers shall be arranged.
 - III. Fencing of loading areas like flammable stores, paint oil storage and other combustible material storage with "no smoking or naked flames" sign. Also such areas to be kept free of dry grass / vegetation.
 - IV. Fire extinguishers shall be conspicuously located and the personnel should be trained in the use of the same.
 - V. All hot work shall be routed through permits and thoroughly inspected and supervised.

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VI. All electrical equipment shall be of sufficient rating and the junction boxes, fuse units properly closed and located at sufficient height free from dry grass / vegetation in close vicinity. Cable running either underground or at sufficient heights.

12. IDENTIFICATION OF EMERGENCIES

Sr. No.	NATURE OF EMERGENCIES
1.	<u>Incidents:</u> • Fire • Panel blast (Power panel / Capacitor) & flash cover • Health Emergency inside WTG • Collapse of structure & Crane • Road incident • Electrocution • Electrical flash over (HT line) • Crane / Vehicle topple (Plain Road, Turn, Hill)
2.	<u>Environmental Emergencies:</u> • Flood • Thunder storm • Lightning • Cyclone • Earth quake • Insect & Snake Bite

13. IDENTIFICATION OF HAZARDOUS AREAS:

Sr. No.	ACTIVITY	HAZARDOUS ASPECTS
1.	Working at height	Any emergency during height work activity
2.	D.G. operation/ Hot work & Power tools application	Electrical shock, Electrocution/Fire
3.	Crane functions	Any major/minor incident / Electrical shock, Electrocution
4.	Men/Material transportation by Vehicles	Road incident
5.	Civil Construction work/Blasting activity	Any major / minor accident / Fire
6.	Electrical Construction & Commissioning work	Any major / minor incident / Electrical shock, electrocution
7.	WTG-Tower installation / Machine Installation / Electrical & Commissioning work / De-installation work	Any major / minor incident / Electrical shock, Electrocution / Fire
8.	Service, Substation, External electrical activities	Any major / minor incident / Electrical shock, electrocution
9.	Handling & Storage of Diesel, Petrol, kerosene or other lubricants / Chemicals / Transformer oil	Fire
10.	Preparation of food	Food poisoning

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14. FACILITIES / EQUIPMENTS FOR EMERGENCIES:

a. Emergency Control Centre (ECC):

Emergency Control centre is arranged in Container / First aid centre / Site offices/Substation as per the availability of resources at sites.

List of Equipment's shall be provided in ECCs.

Sr. No.	ITEMS
1.	On site Emergency plan
2.	Material Safety Data Sheet (MSDS)
3.	Rescue kit (Applicable for WTG)
4.	Stretcher
5.	Barricade tape
6.	PPE – Electrical gloves (HT), Goggles etc.
7.	First Aid Box
8.	Fire Extinguishers
9.	Earth rod
10.	Emergency Contact numbers display board

b. Fire Fighting Facilities:

Different types of fire extinguishers are strategically located at CTF, Site locations, Containers, Site offices, Substation, WTGs, etc. Periodical fire fighting training shall be provided for Site personnel.

c. Medical facilities:

First aid boxes are available at Site Containers, Offices, Substation, WTG locations, 4 wheelers and Guest houses. The stock of First Aid material shall be replenished by a designated person. In case of emergencies, the affected personnel can also be transported to near-by hospital. Periodical First Aid training is provided to all site personnel.

d. Rescue System:

Periodical training for rescue is provided for Site personnel (technician & Engineers). Rescue kit shall be available at site office/sub - station for rescue operation. During emergency, ambulance or available vehicle at site can be used for transport the injured persons to the First aid centre or nearby hospital.

e. Emergency Vehicle:

One vehicle must be available at site/guest house around the clock.

15. INCIDENT REPORTING:

Anybody seeing an incident situation shall report to his colleagues / site in charge / team leader / department giving his identity.

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16. COMMUNICATION FACILITIES:

a. Emergency Contact Display Board:

Emergency Contact Display Board shall be provided in the project office area for immediate contact of key personnel. (Internal key personnel, nearby hospital, Fire stations, Ambulance details)

b. External communication:

Site is very well connected with corporate office through Mobile.

c. Internal communication:

Site is very well connected with internal by way of Mobiles.

17. ROLES & RESPONSIBILITY OF PERSONNEL:

a. Contractor workmen / IGESL Technician

- I. Anybody seeing an incident / abnormal fire/situation shall report to his colleagues / site in charge / team leader/department and giving his identity.
- II. Do evacuation if possible by using available emergency equipment's or call colleagues or other personnel for assistance / help / need of rescue device.

b. Team Leader / Engineer / Contract Supervisor

- I. Provide proper guidance to contract workmen / technician for evacuation.
- II. Inform to Site in charge / Regional Head about evacuation.

c. Site In- charge / Regional Head

- I. On receiving information, inform to site key personnel for evacuation.
- II. Reach emergency sport and arrange required help for evacuation.
- III. Co-ordinate with admin department for external agency helps (Ambulance, Fire brigades etc.)

d. Functional Head:

On receiving information from Site in charge / Regional head arrange required support.

- I. Depute technical expert if required.
- II. Inform to Director if required.

e. Administration & HR Head:

They shall co-ordinate and arrange the following:

- I. Collect head count if required.
- II. Transport arrangement
- III. Additional security if required
- IV. Food /Water or any other welfare facility.
- V. Liaise with outside agencies like Hospitals, Fire brigades, Ambulance etc for referral.

f. Security

- I. Follow instruction from Admin / HR Head.
- II. Allow only authorized personnel in the emergency area.
- III. Make entries of men, material & vehicle entering and leaving form emergency area.

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18. MOCK DRILL:

Success of an OEP depends on planned and unplanned MOCK DRILLS, if conducted regularly. MOCK drill helps all employees to get familiarized with the OEP and also check the accuracy of their roles.

Procedure for Mock Drills (planned):

- a. Inform all employees about MOCK DRILLS
- b. Fix a date and location of the emergency site for MOCKDRILL
- c. MOCKDRILLS will be monitored by observers giving due importance to response time and proper procedure (Who would be senior officers not involved in the exercise).
- d. All members would follow instructions as per OEP.
- e. After emergency clear the all employees shall return to their respective work place and take the supervisor's instructions.

19. ASSEMBLY POINT:

Assembly points shall be identified in the project site, service offices, for assembly of persons during emergency. A board is to be provided for easy identification of assembly point, wherever feasible.

20. Do's and Don'ts:

a. Do's

- I. On seeing an incident / abnormal fire / situation shall report to concern person.
- II. Do evacuation or need help for evacuation, follow supervisor instructed
- III. Assembled in assembled point if required.
- IV. Take head count if required.

b. Don'ts

- I. Do not panic
- II. Do not communicate with any external agency, unless instructed
- III. Do not spread rumours
- IV. Do not keep any telephone engaged for a long time
- V. Do not approach the emergency site as a spectator

21. Fire Extinguishers Location:

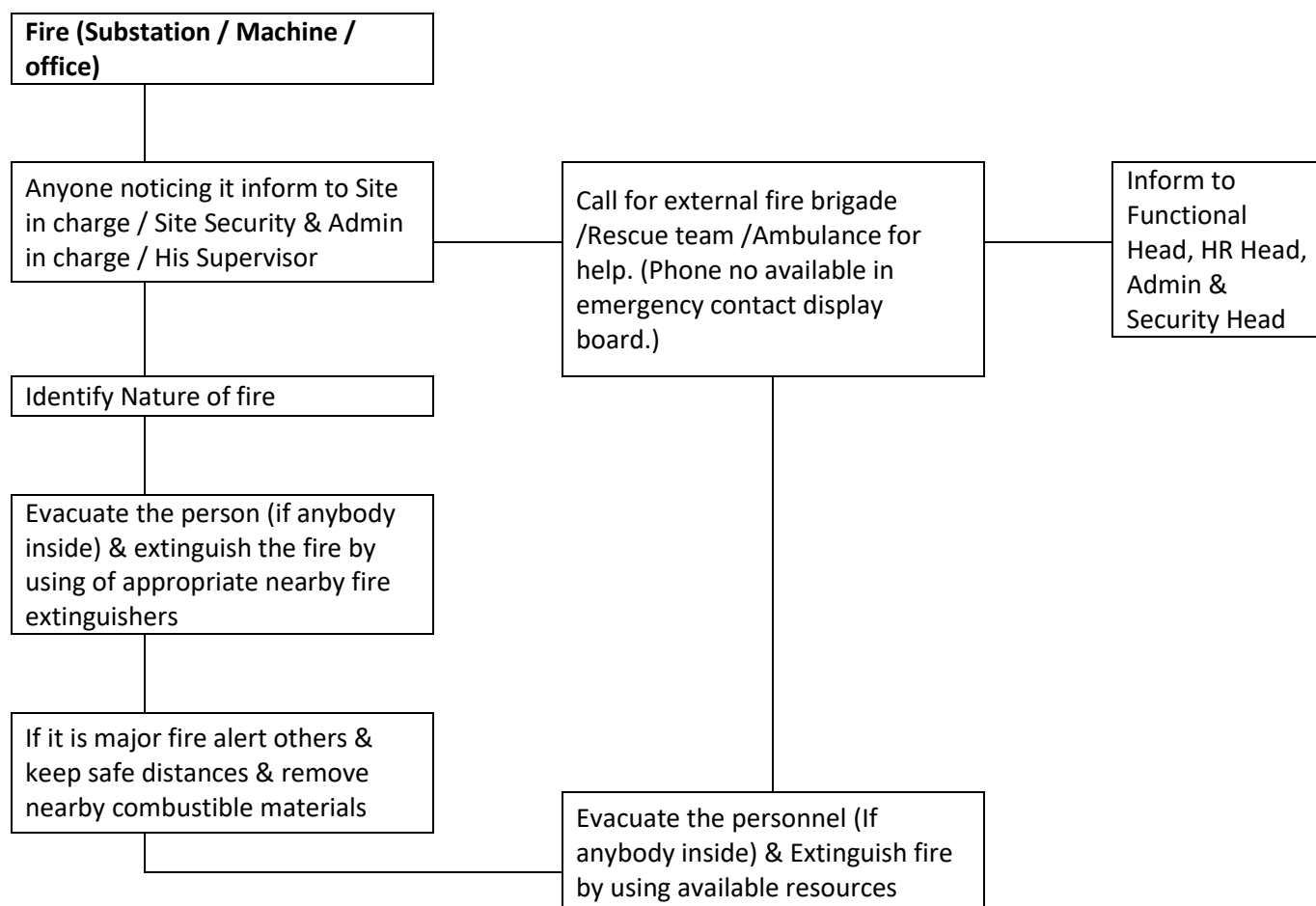
Sr. No.	Location	Type of Extinguishers	Capacity
01.	WTG (Nacelle)	A/B/C	2Kgs.
02.	WTG (Bottom)	A/B/C	5Kgs.
03.	GSS/Site Office	A/B/C/FOAM	5Kgs./25 Kg/50 L
04.	USS	A/B/C/FOAM	5Kgs./15L
05.	Guest House	A/B/C	5Kgs.
06.	DG	A/B/C	5Kgs.
07.	Storage Flammable Area	CO2/B	5Kgs.
08.	Hot Work Area (Welding etc.)	A/B/C	5Kgs.
09.	Canteen	A/B/C	5Kgs.

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22. PROCEDURE STEPS FOR HANDLING EMERGENCIES:

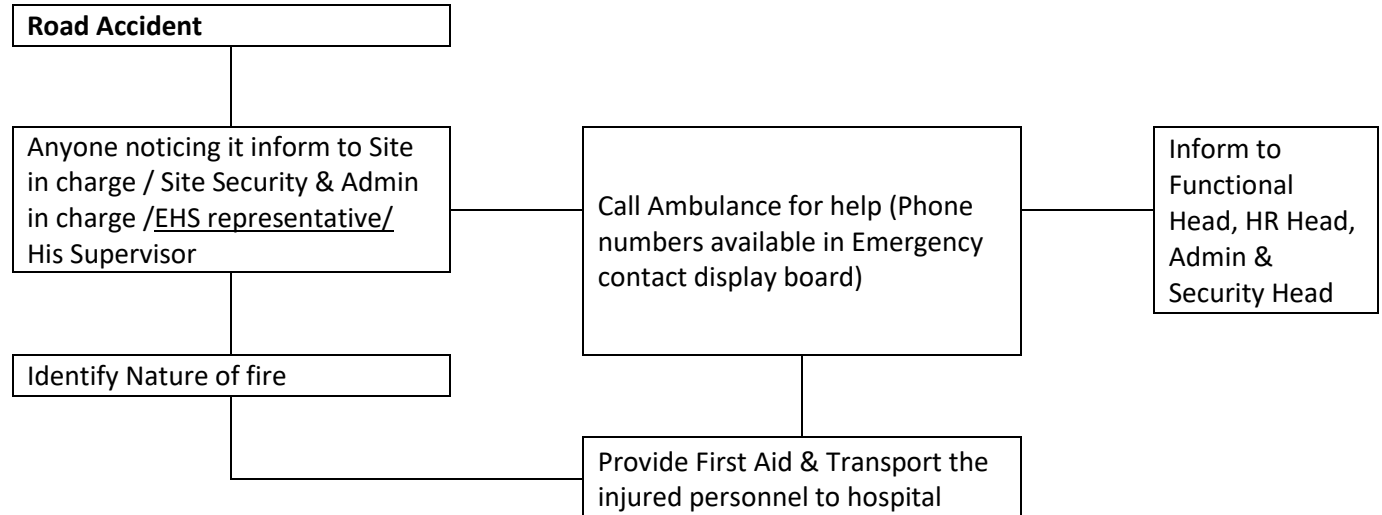
a. Procedure for Fire Emergency



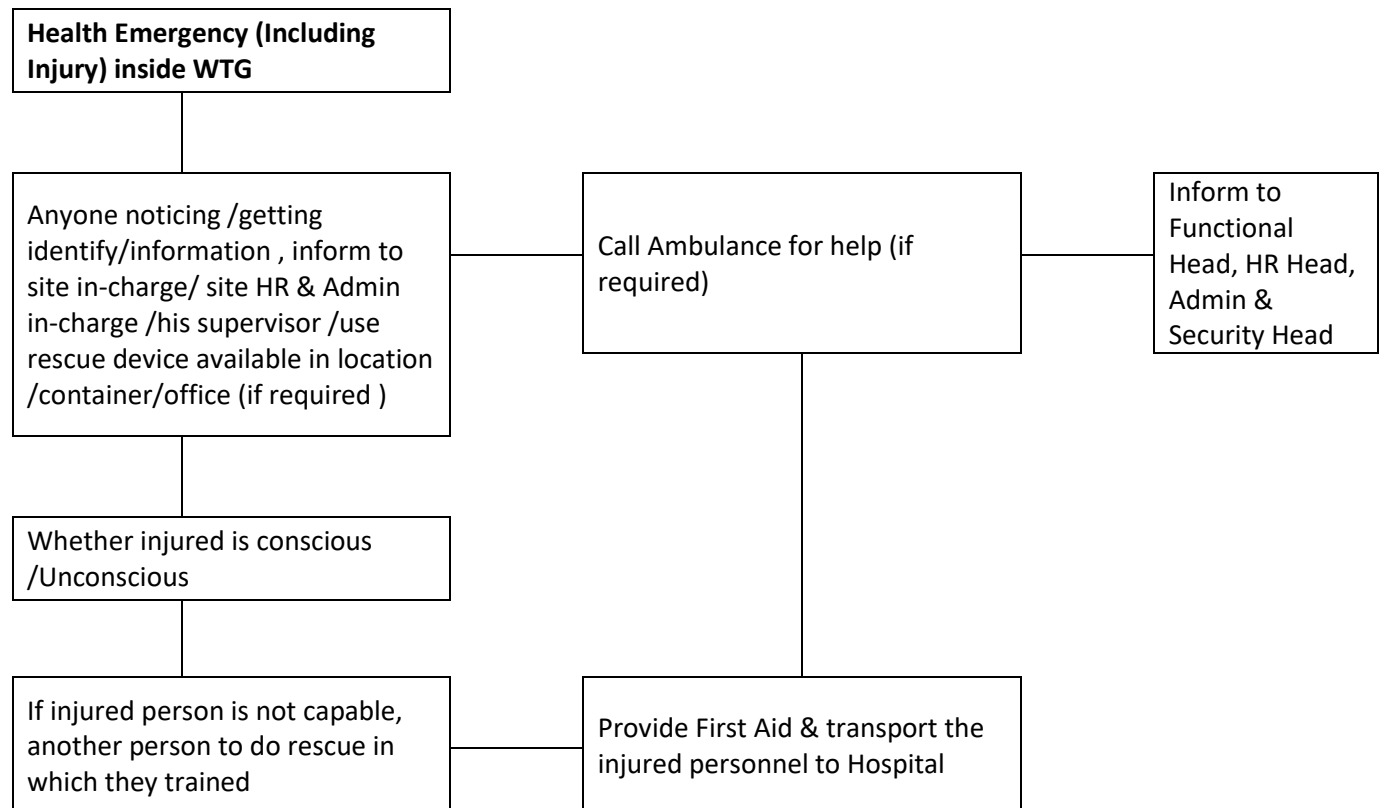
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b. Road Accident:



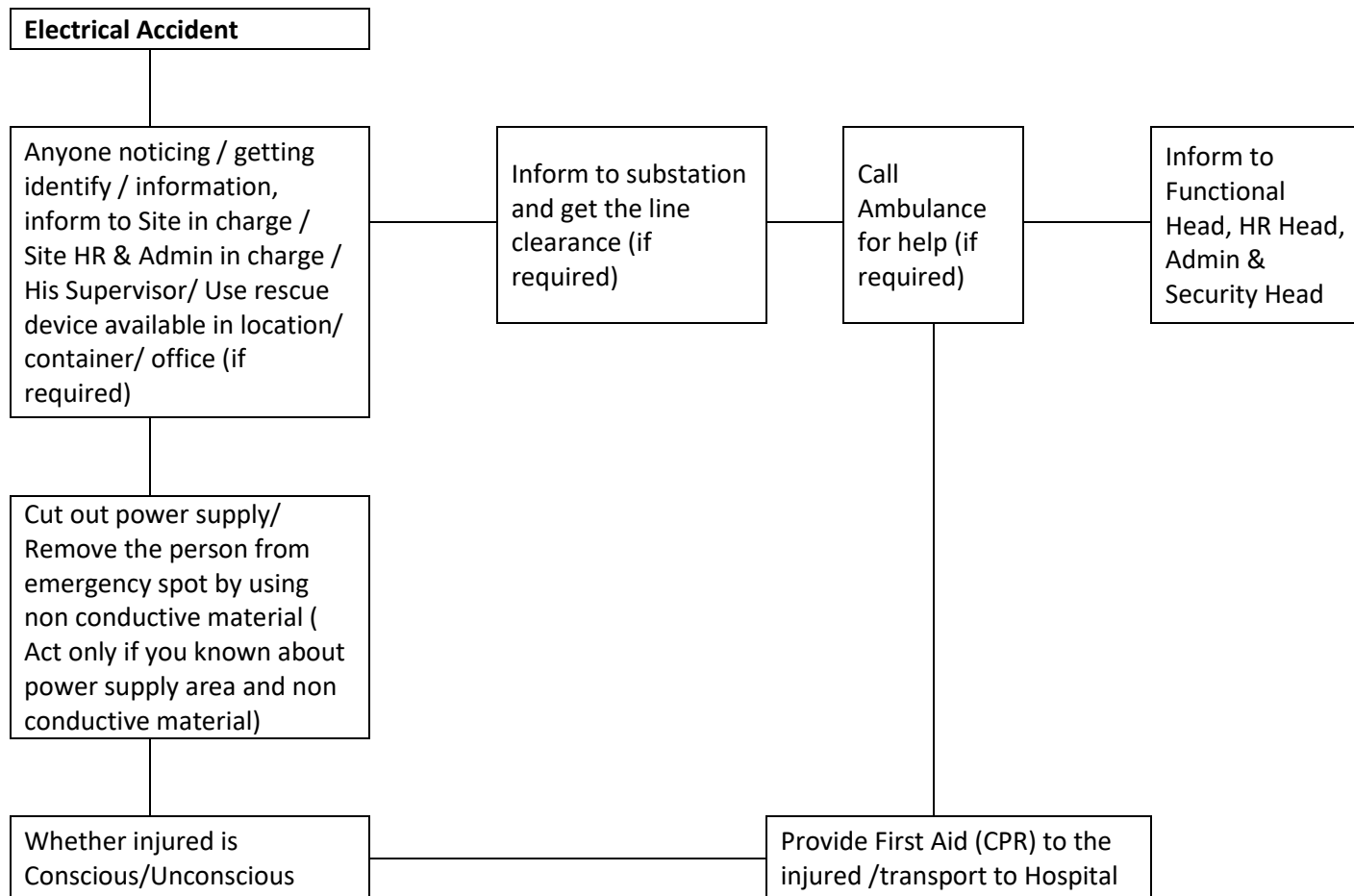
c. Health Emergency



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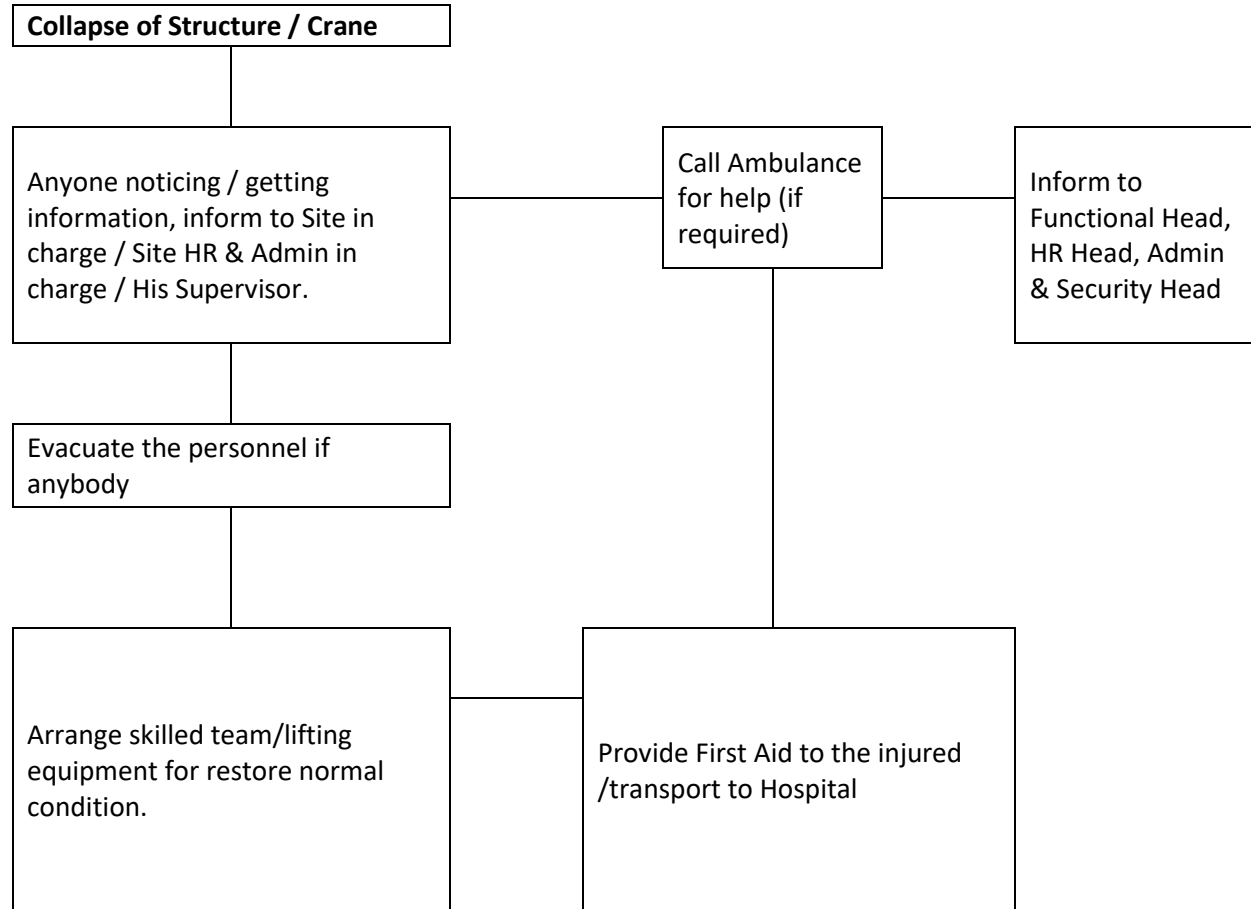
d. Electrical Accident:



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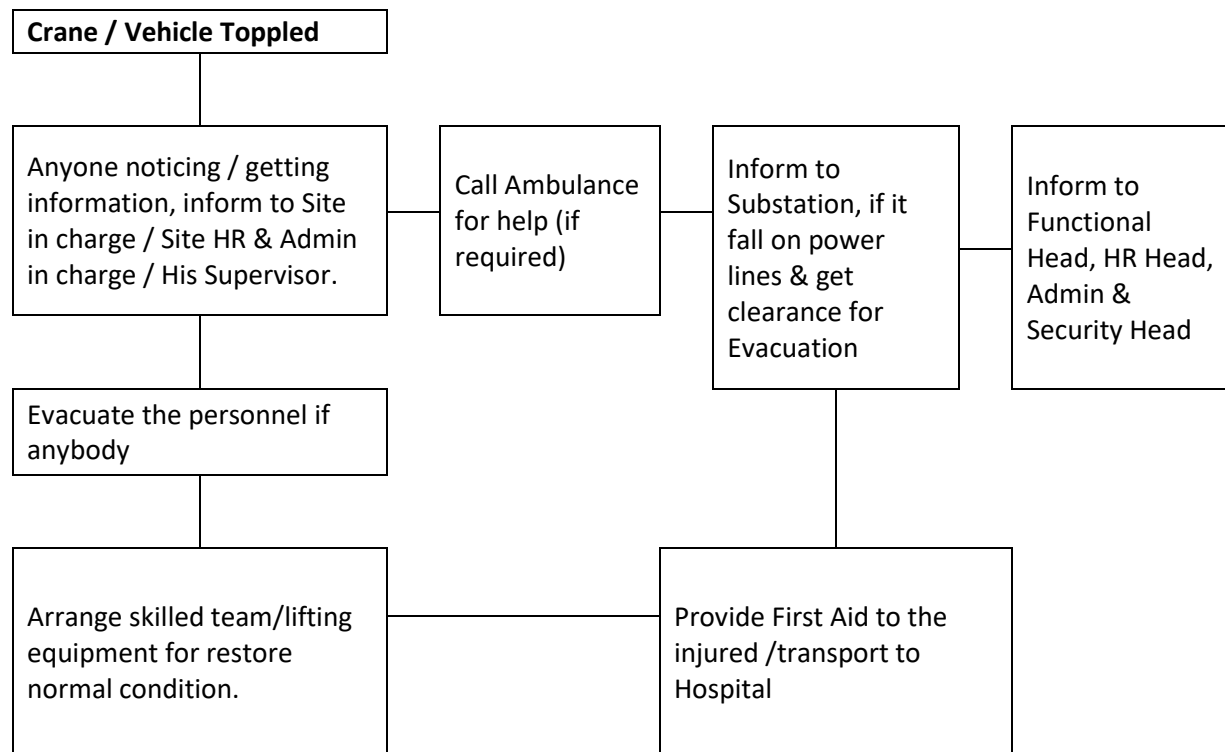
e. Collapse of structure / Crane:



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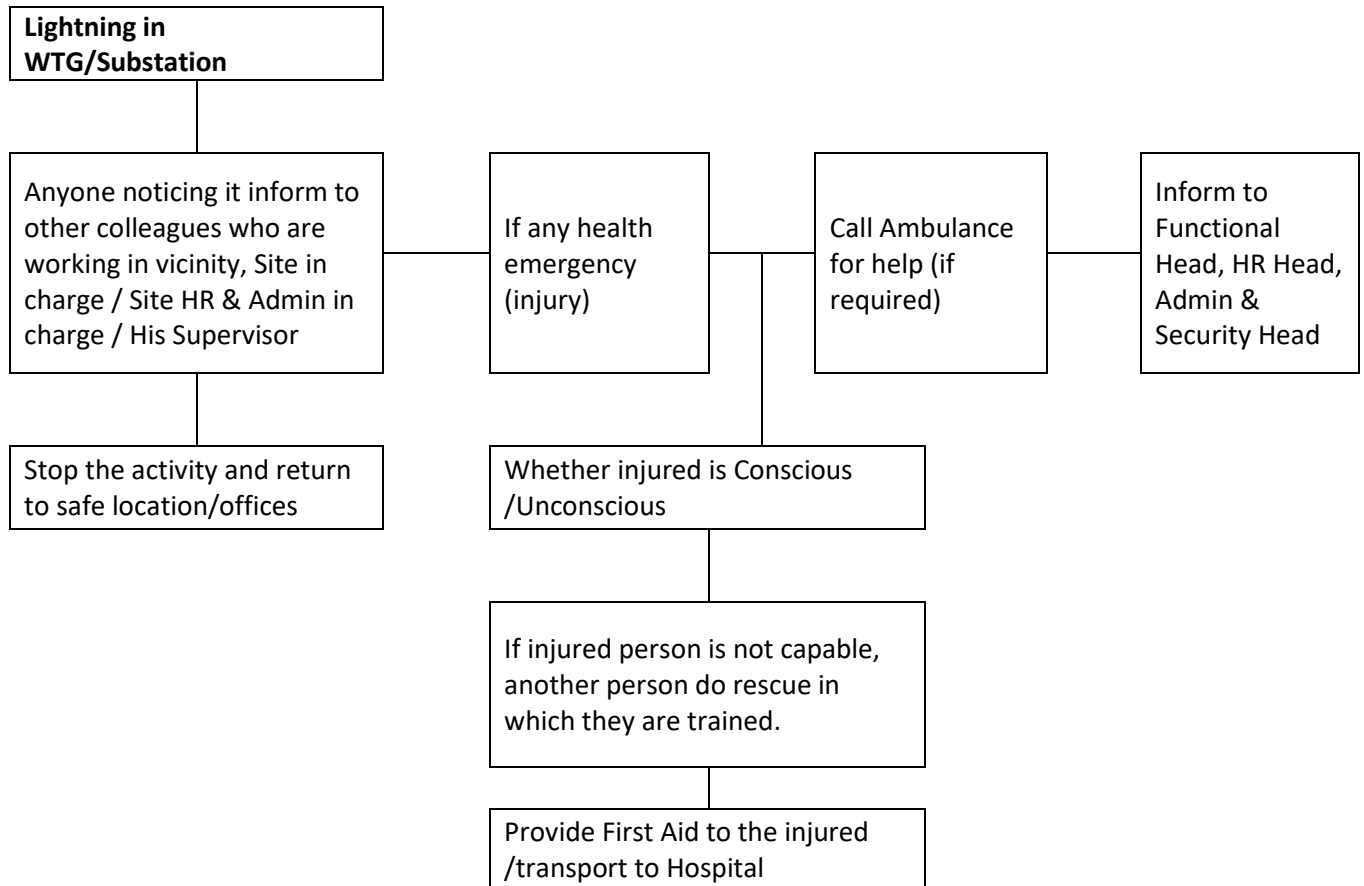
f. Crane / Vehicle Toppled (Plain Road, Hill):



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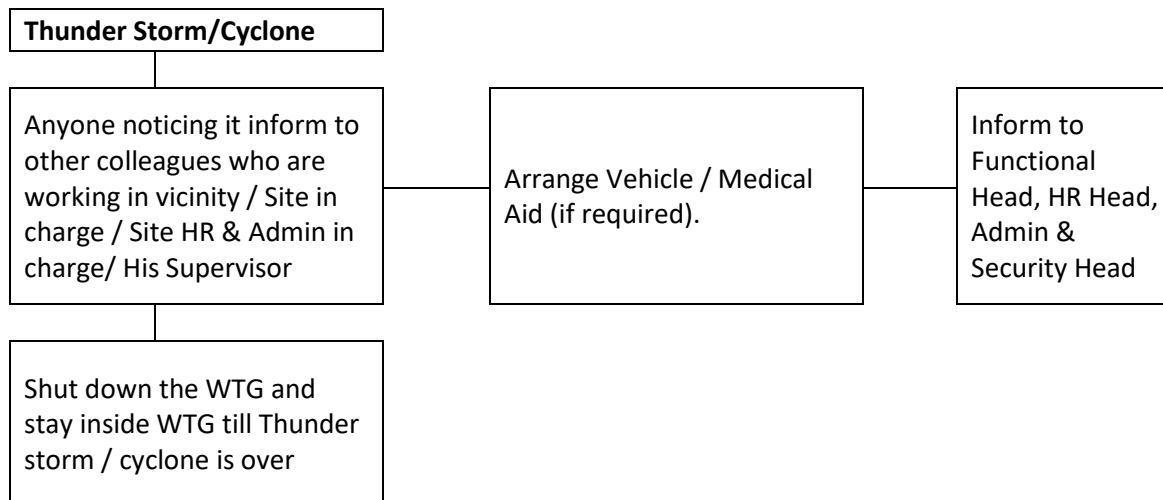
g. Lightning strike while working in WTG/Substation:



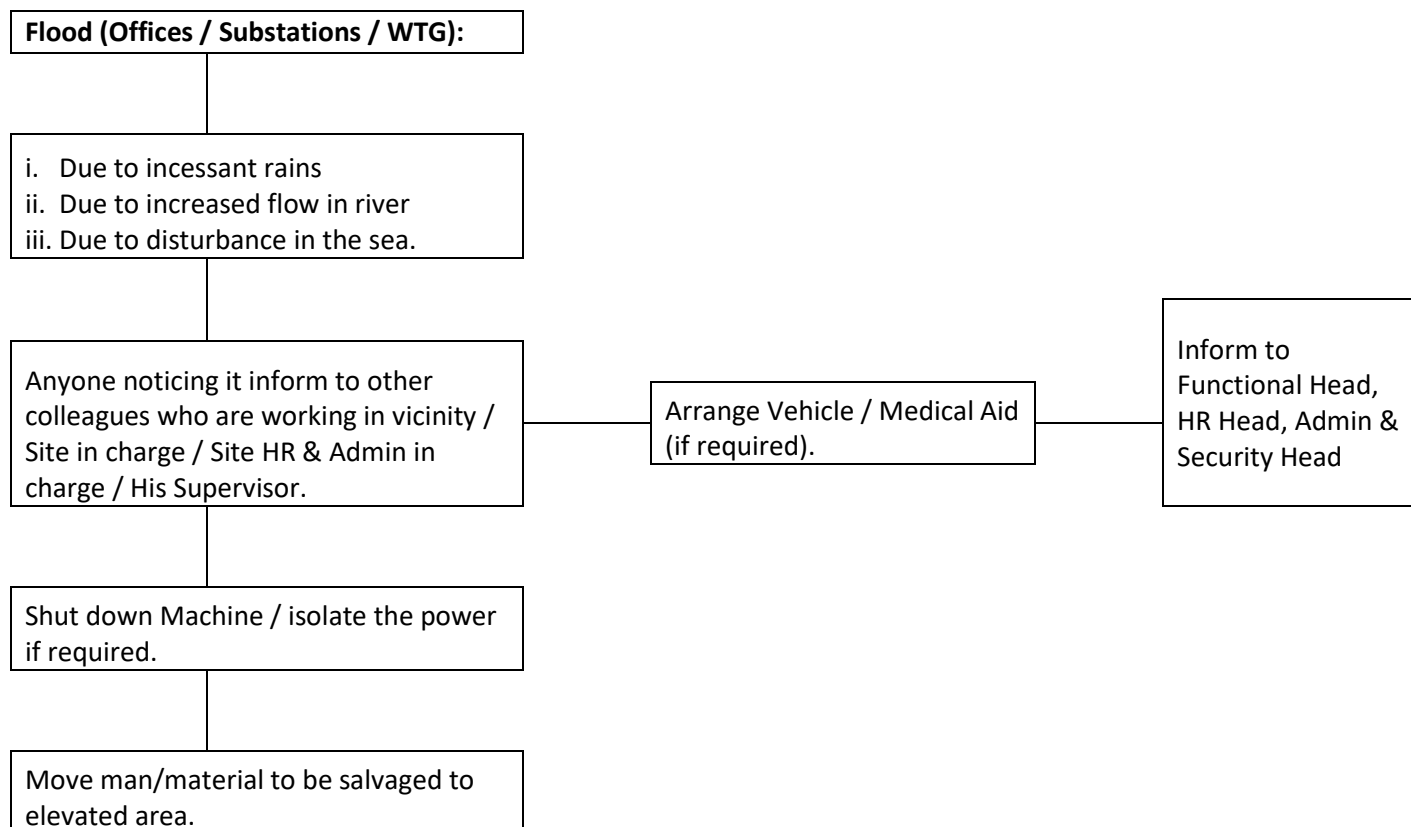
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h. Thunder storm / Cyclone while working on WTG:



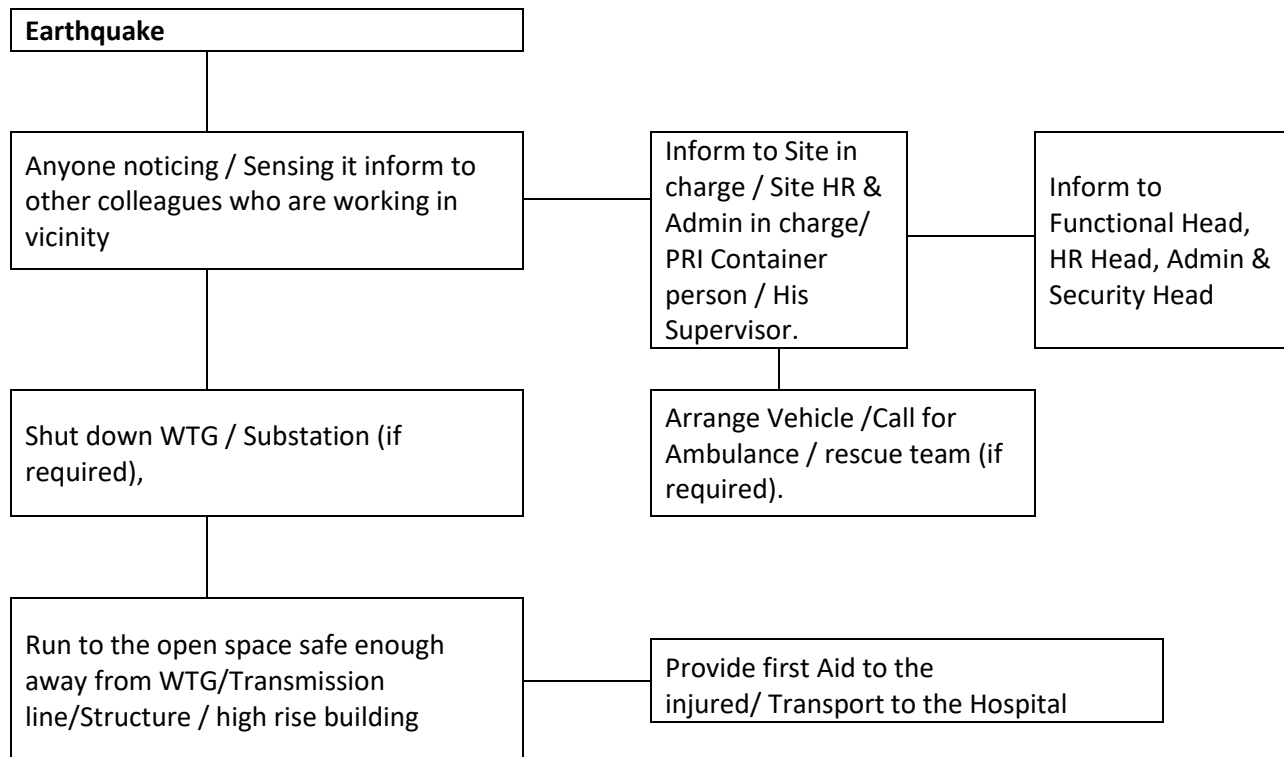
i. Flood (Offices / Substations / WTG):



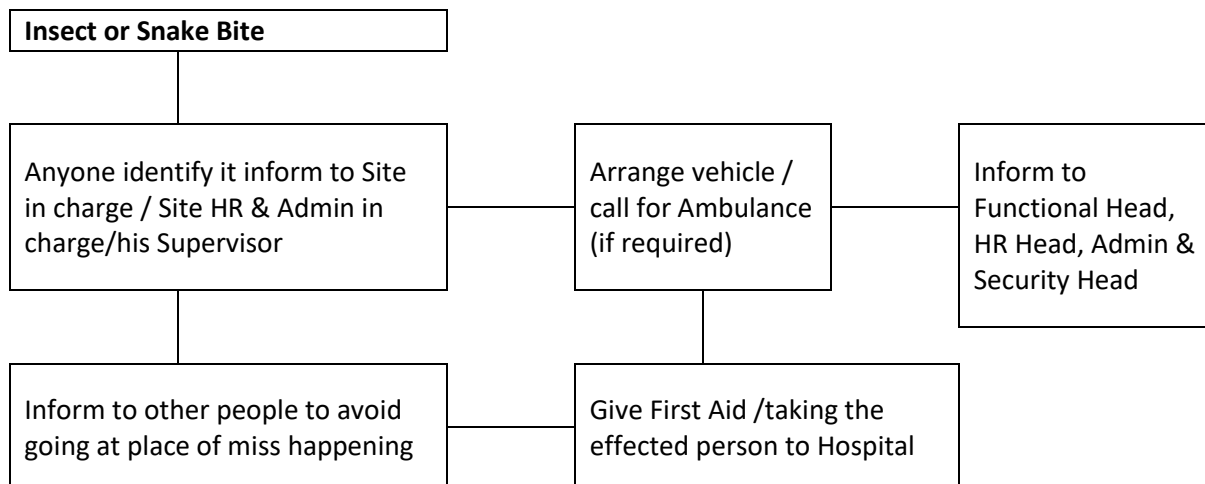
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i. Earthquake:



J. Insect or Snake Bite:



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23. SOP's for Rescue from Turbine

1. PREAMBLE:

Standard operating procedures/guidelines (SOPs/SOGs) for emergency operations at wind turbine sites are absolutely necessary. The IGESL wind turbines consists of 300 feet or more than 300 feet high with very slim access shafts (generally no elevators/lifts/Climb assist, just vertical ladders) and extremely confined interiors. Although a few towers has equipped with elevators/Lift/Climb assist, they would be very tight spaces. They could be used where available for lifting some rescue personnel and equipment up to the nacelle, although it would be difficult to lower a victim unless that person could be evacuated in a standing position.

A wind turbine generator is essentially a sophisticated windmill, similar to those still used in many rural areas. These wind turbines may be situated along hilltops, desert area, on flat plains or on some unapproachable village roads.

Here are some pictures below shows brief idea of wind mill structure;

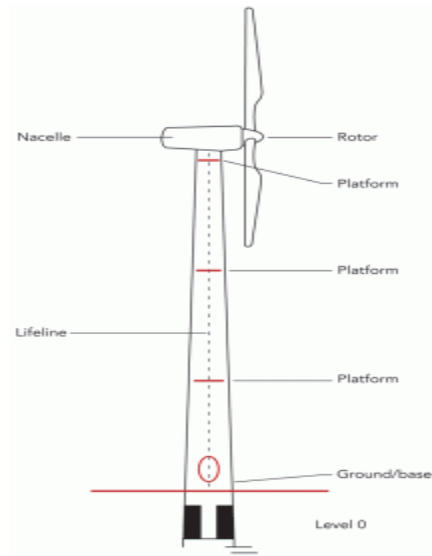


Figure 1. Wind Turbine Tower



Figure 2. Tower Interior

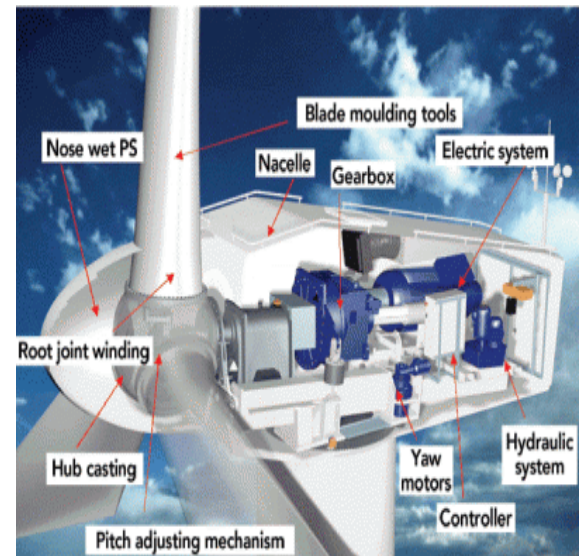


Figure 3. Nacelle Interior

SCOPE:

In the wind energy industry, preparation for fall protection and rescue plays a vital role to workers. They risk their lives at extreme heights, with some of the tallest towers reaching several hundred feet. The aim of this document is to establish the system for Emergency evacuation in the Wind Turbine area and determination of the necessary controls, in all the organizational units. This Guideline/ SOP are being prepared to smooth handling during an emergency and internal training purpose.

This guidelines covers during project installation, Commissioning, O&M, performing major activities at all wind sites/ locations.

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2. OBJECTIVE:

The Company is committed to provide all necessary safeguards to all our human resources. We manage to provide rescue gears/equipments at all our sites to handle hassle free rescue operation during critical situation. We also committed to provide time to time internal or external training. The SOP provides a general procedure for rescue operation at wind sites.

3. PURPOSE:

Purpose of this procedure is to establish & maintain documented procedure to monitor & measure the key characteristics of the operations & activities that can have a significant impact on the environment. This procedure is applicable to all processes & services performed inside the all IGESL's site, which can have adverse impact on environment & put affect the regulatory compliance.

4. BASICS OF RESCUE RESPONSE:

Before going into specifics, there are some basic guidelines for responding to any rescue scenario. The first is, don't put yourself in danger: If a worker rushes in to rescue someone else, he can put himself in danger, meaning there will be two rescues to perform.

Assess the situation: Even in an emergency, workers should take a moment to assess the best approach to a rescue. Before beginning a rescue, raise the alarm. Following any emergency procedures in place, notify the appropriate parties of the situation, then begin the rescue.

There are some common rescue scenarios that can occur while working on all IGESL wind towers.

- a) Rescue from the ladder inside the tower that provides climbing access to the nacelle** – Although maintenance work usually is not performed on the ladders after the tower has been constructed; they provide workers with a means of access to the nacelle. This poses a potential threat to worker safety when they must climb to great heights, usually multiple times a day. Even though the climber can use the platform (T1, T2, T3) to rest, the climb still can be physically demanding, leading to cramping, fatigue, heat and cold stress, and more.

Other hazards in this scenario include slipping on an oily or muddy ladder, as well as the constant threat from items such as, cell phone and helmet, tools from tool bag which can be dropped or fall, striking workers below.

Ladder rescues in this situation are challenging and must be planned from both the ground and from the nacelle. The size and portability of a complete rescue system is crucial, as it must be deployed and carried to the victim from the ground or down the ladder if it's stored in the nacelle.

- b) Rescue from the top of the nacelle roof** – This scenario can occur if an emergency happens while working on top of the nacelle or if the worker slips while moving on the nacelle, possibly while trying to access the hub.

Non-entry fall protection rescue is reserved for injured workers who are suspended by fall protection, but are conscious, alert and can adequately protect themselves during a lowering operation. To perform such a rescue, the rescuer must have access to the victim's anchor point, integrated lanyard rescue D-ring or harness D-ring.

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It also is possible that the victim in such a situation may be injured or unconscious on top of the nacelle. In this case, it would be necessary to lower the victim over the edge of the nacelle. In cases where victims fall over the side, there may be a need to pick them up off of their fall protection equipment.

Challenges in this rescue scenario include deploying and carrying the entire rescue system to the top of the nacelle. Normally, the rescue equipment would be stored there, but there's still a need to get all the equipment through the top hatch to the top of the nacelle.

- c) **Rescue from inside the nacelle** - This scenario may occur at any time, as the worker likely is working inside the nacelle most of the time. Workers can encounter electrical hazards, sustain injuries from working on the heavy equipment or experience medical conditions that leave them incapacitated.

This rescue may be challenging because the employee may be working under or around equipment away from the escape hatch. Further, the employee likely will be working without a fall protection harness. There also may be a need to lift the technician up from where he's working, which may be down below the equipment or on the opposite end of the nacelle from the escape hatch. Putting the victim's harness onto him is imperative to complete the rescue.

The victim also must be transported from his location, over equipment, to the escape hatch. Cross-haul techniques are best used for this to allow a single person to perform the rescue. Multiple lifting systems make this process very simple and efficient. Pulley systems carefully should be monitored while in use. If increased resistance occurs during the process, operations should cease to check the victim for a trapped body part or equipment.

- d) **Rescue from inside the hub** – When a worker is inside the hub, rescue may be challenging, particularly if the rescue system is stored in the nacelle as it must be deployed and carried to the victim. Anchoring to pick the victim up also may prove difficult, meaning cross-haul techniques must be used to move the victim's body up and diagonally out of the hub. Multiple lifting systems make this process feasible.

The hub is a very dirty, greasy environment, so it's important to ensure that the rescue system is not significantly affected by possible contamination.

- e) **Self escape in case of an emergency** – Emergency scenarios can occur when a worker may need to escape the nacelle to ensure his own safety. The hazard from which a worker may need to escape affects the choice of the escape point. If there's significant heat in the nacelle, the worker may be under major duress. In this case, ensure the rescue system operates with fire-resistant rope.

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5. THE EMERGENCY RESPONSE PLAN:

OBJECTIVES OF THE ON-SITE EMERGENCY RESPONSE PLAN

- Any emergency occurring within IGESL/IWL may cause injuries or loss of life or damage to the property or disruption inside as well as outside the site premises. Considering the activities carried out in the site and importance of preserving life, environment and property within and outside the site, IGESL/IWL Management has the On-site Emergency Response Plan.
- Preserving the life, property and environment from the consequences of emergencies arising within the Sites/plant.
- Restoring normalcy in site operation with minimum loss of time.
- One of the main objectives is to keep the site running, unless the emergency is created by a technical site problem.

Identifies major hazards having potential for On-site Emergencies.

The Hazards has been identified and recorded according to the sites.

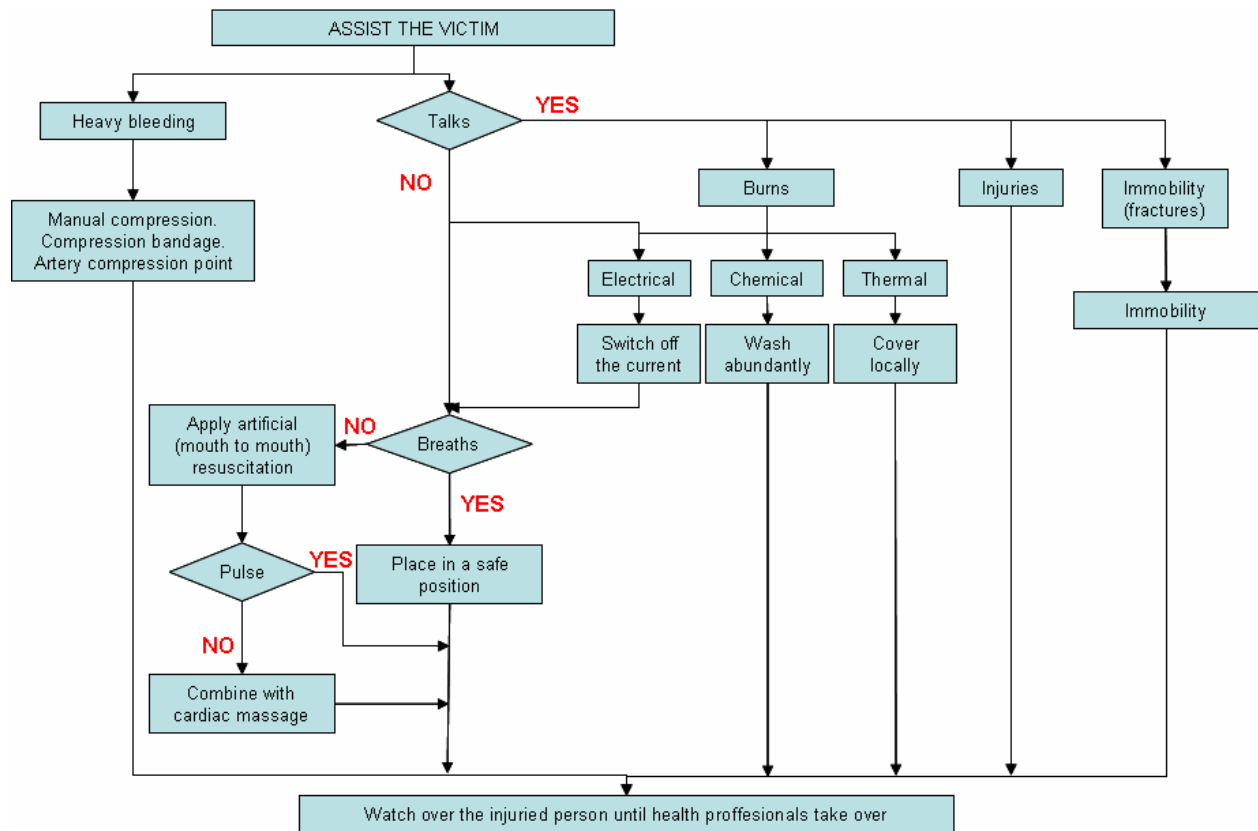
Every site must prepare and display following team to handle emergency situation accurately;

- Rescue Team.
- Fire Fighting team.
- First Aid team.

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HELPING THE VICTIM



6. EMERGENCY CONTACTS:

Site admin team must collect below emergency contact numbers in a single frame and display at all Appropriate places.

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Sr. No.	Contact Person	Contact Number
1.	Ambulance	108
2.	Fire Brigade	101
3.	Police	100
4.	Nearest/ Tie up Hospital	91 0000000000
5.	Snake Catcher	91 0000000000
6.	Site in Charge	91 0000000000
7.	HSE in Charge	91 0000000000
8.	Admin in Charge	91 0000000000
9.	Security in Charge	91 0000000000
10.	State Head	91 0000000000
11.	O&M Head/ Project Head	91 0000000000/91 0000000000

7. ASSUMPTIONS:

- The possibility of occurrence of major emergencies other than those envisaged by INOX based on the major hazards identified in Risk Assessment done by INOX is remote.
- INOX management will provide necessary infrastructure at the site/plant, training to employees and enter into agreement as well as with hospitals as envisaged in the plan.
- Possibility of cascading of consequences due to the identified emergencies is remote.
- The meteorological data obtained from the records provided by INOX WIND is assumed to be accurate.

8. PROCEDURE TO HANDLE SPECIALIZED EMERGENCIES:

Guidelines To Handle Telephoned Bomb Threats:

- Keep calm. Keep talking.
- Don't hang up.
- Signal a co-worker to get on an extension.
- Ask the caller to repeat the message and write it down.
- Repeat questions, if necessary.
- For a bomb threat, ask where the bomb is and when it is set to go off.
- Listen for background noises and write down a description.
- Write down whether it's a man or a woman; pitch of voice, accent; anything you hear.
- Try to get the person's name, exact location and telephone number.
- Signal a coworker to immediately call a contract guard, or the local police.
- Notify your immediate supervisor.

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9. WIND TURBINE EVACUATION IN CASE OF EMERGENCY:

Evacuation in case of fire:

- a) If a fire breaks out inside the wind turbine, consider the possibility of fighting it as long as the safety of people is not compromised. Bear in mind the size of the fire and the resources available. The portable extinguishers in the wind turbine or in the transportation vehicle are only effective in the initial stage of a fire. Once the fire has taken on considerable dimensions, they should no longer be used.
- b) The way in which the wind turbine should be evacuated will depend on the relative position of the people in relation to the fire. Whenever possible, evacuation should take place using the habitual access routes (tower ladder). Do not use the lift in the event of a fire, it could delay and complicate the evacuation. As a general rule, the following criteria should be applied:
- c) Zero level fire in the wind turbine and staff on the same level. Evacuation should be carried out through the door of the wind turbine tower.
- d) Fire in the base of the wind turbine and staff at a higher level (tower or nacelle). The evacuation should be carried out by accessing the nacelle as quickly as possible and using the emergency descent system. Owing to the presence of smoke, protect your airways with the means available.
- e) Fire in the nacelle and staff at a lower level. Evacuation should be carried out using the habitual access routes to the wind turbine.
- f) Fire in the nacelle and staff in the nacelle. Exit the nacelle using the habitual access routes to the wind turbine. The use of emergency descent equipment is forbidden.
- g) In the event of a fire, the wind turbine affected must be isolated from the mains power grid as soon as possible, either by the action of the smoke detector which will automatically open the wind turbine call, or if this opening does not occur automatically, by disconnecting the wind turbine from the mains power directly from its cell, from the substation or from the cell of the previous wind turbine on the same line.

10. USE OF THE EMERGENCY DESCENT SYSTEM:

The emergency descent system must be used to evacuate the wind turbine in the event that the usual route (ladder or lift) cannot be used, either because the elements are broken, an injured worker must be evacuated, or a fire breaks out at a level below the nacelle. This equipment might be present in the nacelle, and if not, the first operation when carrying out any work in the nacelle (unless only accessing this area for operations such as the switching on heating elements, differentials...) will be to hoist the Emergency Descent System using the chain hoist, making sure that the length of the rope corresponds to the height of the wind turbine.

Depending on the type of wind turbine, we might find the inside types of emergency descent systems:

The equipment included in the emergency descent bag is as follows:

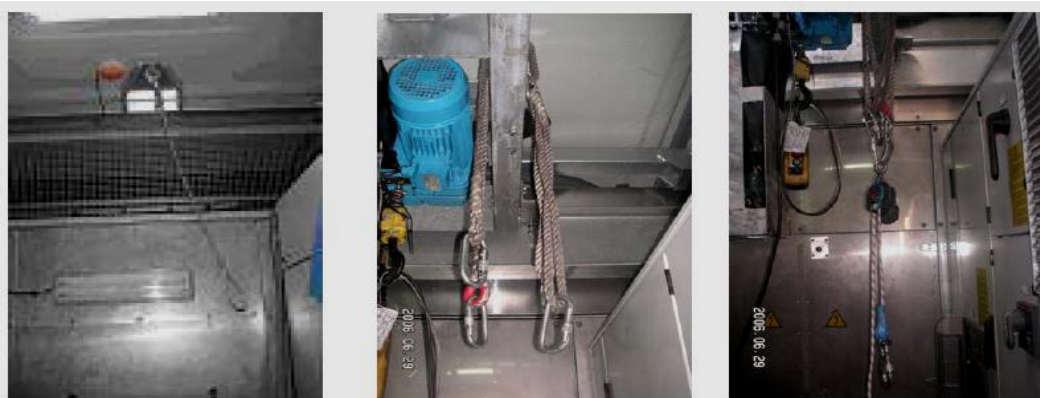
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- a) Equipment transportation bag.
- b) Descent pulley with rope.
- c) Safety rope with carabiners (approx. 1m). If the equipment does not have a safety rope, the shock absorbing system may be used with carbiners that all workers carry as PPE.

11. EVACUATION OF THE WIND TURBINE RD- 93/RD-100/ RD-113:

- a) To use this equipment, the following procedure must be observed:
In wind turbines that have the towrope system installed (Photo 42) position the descent system on it, lock the carbiner safety lock and drop the bag with the pulley rope over the side. In wind turbines that do not have a towrope installed, pass the safety rope over the chain hoist cart beam (Photo 43) and position the descent system in the carbiners, lock the carbiner safety lock on the emergency descent system and drop the bag with the pulley rope over the side. In both cases, make sure the rope is fully extended and has no knots.



- b) Secure the descent system with the safety rope to the generator.
- c) Attach the carbiner at the end of the rope to the harness at the chest attachment point and lock the safety lock.



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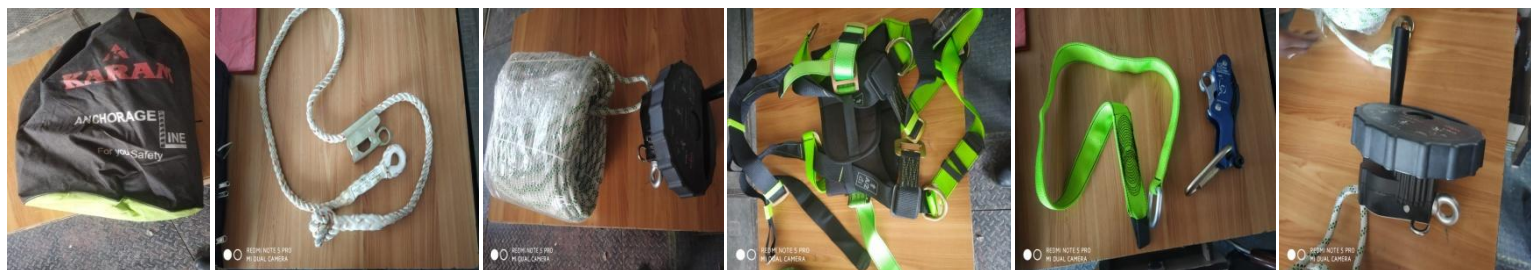
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- d) Climb and let you drop down; the descent system will maintain a constant speed of 0.8 m/s.
- e) Once on the ground, release the carabiner, and a second person can start their descent.
- f) Depending on the height of the tower, the person at the top may have to pull back a few meters of rope so that the carabiner is at the top in order to start their descent.

Every time the equipment is used in an emergency it must be checked by the manufacturer or authorized company. The equipment must also be checked annually even if it has not been used; therefore, when either of these situations occurs the equipment shall be handed into the corresponding department to be checked by the manufacturer or authorized company.

In the event that the emergency is uncontrolled and the intervention of the Fire Service or Ambulance Service is required, call the emergency numbers and following the instructions received from them once they take control of the emergency situation.

Some pictures of accessories of rescue kit (Make- KARAM) mostly, which are available at all IGESL sites.



12. CONFINED SPACE RESCUE IN CASE OF ACCIDENTS:

If you are the person standing outside the confined space:

- a) If the person inside the confined space is trapped with the falling material, shut down all material moving equipment and stop the flow of material.
- b) If the injury is caused by electrical power supply, de - energize the equipment / circuit.
- c) Do not enter the confined space until help is available
- d) 4. If the person is struggling for survival, proceed to hoist him to the top of confined space after giving directions to him in a louder voice
- e) Firefighting and rescue team personnel will enter the confined space after ensuring safe oxygen levels with the help of oxygen detectors.
- f) Assist the victim to come out of the confined space by using rescue kit.
- g) Transport the victim using the ambulance.
- h) Ensure tools and other materials are taken out from confined space.

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13. MOCK DRILLS:

Mock drills on the overall emergency response plan may be carried out once in 6 months to ensure continued familiarity of the Key Personnel with the emergency procedure and to check if the hardware infrastructure provided for emergency management is in good condition.

POWER TO AMEND:

- a. Any change of the guideline shall be amended by the Head GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own is creations it deems fit from time to time. The decision of the management shall be final and binding

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NEAREST HOSPITALS

1	HOSPITAL NAME		TEL. NO.
2	CONTACT DOCTOR NAME		MOB.NO.
3	LOCATION ADDRESS		
4.	DISTANCE FROM SITE		

LIST OF FIRST AIDERS

SR. NO.	NAME & EC NO.	MOBILE NO.	SR. NO.	NAME & EC NO.	MOBILE NO.
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

LIST OF FIRST AID EQUIPMENTS

1	FIRST AID BOX	NOS.
2	STRETCHER	
3	FIRST AID AWARENESS CHARTS	
4	RESPIRATORS	
5	RESCUE DEVICE	
6	EMERGENCY VEHICLE	

NEAREST HOSPITALS

1	HOSPITAL NAME		TEL. NO.
2	CONTACT DOCTOR NAME		MOB.NO.
3	LOCATION ADDRESS		
4.	DISTANCE FROM SITE		

LIST OF FIRST AIDERS

SR. NO.	NAME & EC NO.	MOBILE NO.	SR. NO.	NAME & EC NO.	MOBILE NO.
1			11		
2			12		
3			13		
4			14		
5			15		
6			16		
7			17		
8			18		
9			19		
10			20		

LIST OF FIRST AID EQUIPMENTS

1	FIRST AID BOX	NOS.
2	STRETCHER	
3	FIRST AID AWARENESS CHARTS	
4	RESPIRATORS	
5	RESCUE DEVICE	
6	EMERGENCY VEHICLE	

Doc. No. IGESL/HSE/F-50/Rev. 05 Annexure: 11.2 Date: 01.04.2022	REPORT OF TIME PERFORMANCE OF EMERGENCY / MOCK DRILL	INOXGreen ENERGY SERVICES LIMITED
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1.	DATE	
2.	SITE INCHARGE / HEAD ON DUTY	
3.	ADMIN & SECURITY HEAD ON DUTY	
4.	MOCK DRILL EMERGENCY SCENARIO	
5.	EMERGENCY ON SITE EMERGENCY / OFF SITE EMERGENCY	
6.	TIME OF – START	
7.	TIME OF – FINISH	

SR. NO.	DESCRIPTION OF EVENT	TIME
1		
2		
3		
4		
5		
6		
7		
8		
9		
10	START OF EMERGENCY REVIEW MEETING	

REMARKS: _____

SIGNATURE:

MOCK DRILL CONDUCTING OFFICER

Doc. No. RESCO/HSE/F-50A/Rev. 05 Annexure: 11.2 Date: 01.04.2022	REPORT OF TIME PERFORMANCE OF EMERGENCY / MOCK DRILL	RESCO GLOBAL WIND SERVICES PVT. LTD.
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1.	DATE	
2.	SITE INCHARGE / HEAD ON DUTY	
3.	ADMIN & SECURITY HEAD ON DUTY	
4.	MOCK DRILL EMERGENCY SCENARIO	
5.	EMERGENCY ON SITE EMERGENCY / OFF SITE EMERGENCY	
6.	TIME OF – START	
7.	TIME OF – FINISH	

SR. NO.	DESCRIPTION OF EVENT	TIME
1		
2		
3		
4		
5		
6		
7		
8		
9		
10	START OF EMERGENCY REVIEW MEETING	

REMARKS: _____

SIGNATURE:

MOCK DRILL CONDUCTING OFFICER

Doc. No. IGESL/HSE/F-51/Rev. 05 Annexure: 11.3 Date: 01.04.2022	REPORT OF OBSERVATIONS DURING EMERGENCY / MOCK DRILL	
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1.	DATE	
2.	SITE TEAM	
3.	TEAM MEMBERS	
4.	MOCK DRILL EMERGENCY SCENARIO	
5.	EMERGENCY ON SITE EMERGENCY / OFF SITE EMERGENCY	
6.	TIME OF – START	
7.	TIME OF – FINISH	

SR. NO.	DESCRIPTION OF EVENT	TIME
1		
2		
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REMARKS: _____

SIGNATURE OF HSE OFFICER:

Doc. No. RESCO/HSE/F-51A/Rev. 05 Annexure: 11.3 Date: 01.04.2022	REPORT OF OBSERVATIONS DURING EMERGENCY / MOCK DRILL	RESCO GLOBAL WIND SERVICES PVT. LTD.
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1.	DATE	
2.	SITE TEAM	
3.	TEAM MEMBERS	
4.	MOCK DRILL EMERGENCY SCENARIO	
5.	EMERGENCY ON SITE EMERGENCY / OFF SITE EMERGENCY	
6.	TIME OF – START	
7.	TIME OF – FINISH	

SR. NO.	DESCRIPTION OF EVENT	TIME
1		
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10		

REMARKS: _____

SIGNATURE OF HSE OFFICER:

Doc. No. IGESL/HSE/ F-52/ Rev. 05 Annexure – 11.4 Date: 01.04.2022	INSPECTION CHECK LIST FOR FIRE EXTINGUISHER	
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Name of the site:

Sr. No.	Area/ Location	Check Points										
		Fire Ext - Type & Kg	Pressure	Condition Hose/Horn	Squeezer Condition	Body of Ext.	Approach for F.E.	Date of Inspection	Due date of inspection	Safety Pin	Regulator Condition	Remarks
	Fire Ext Id No											

Action to be taken:

Inspected by: _____ Signature of Site Engineer _____ Date: _____

Doc. No. RESCO/HSE/ F-52A/ Rev. 05 Annexure – 11.4 Date: 01.04.2022	INSPECTION CHECK LIST FOR FIRE EXTINGUISHER	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Name of the site:

Sr. No.	Area/ Location	Check Points										
		Fire Ext - Type & Kg	Pressure	Condition Hose/Horn	Squeezer Condition	Body of Ext.	Approach for F.E.	Date of Inspection	Due date of inspection	Safety Pin	Regulator Condition	Remarks
	Fire Ext Id No											

Action to be taken:

Inspected by: _____ Signature of Site Engineer _____ Date: _____

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	MEDICAL FITNESS FOR EMPLOYEES	Guideline No IGESL SITE/HSE/012
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1. OBJECTIVE:

The aim of these manual is to make informed and risk based decisions as to nature and scope of any medical fitness assessments that may be conducted. They are not a prescriptive standard and they are not set out as mandatory industry requirements.

2. INTRODUCTION:

These health and safety guidelines provide basic information on how duty holders can endeavour to apply a common approach to conducting suitable medical fitness for work assessments for employees working on renewable energy projects.

3. SCOPE OF THIS DOCUMENT:

This manual only provides information on nature and scope of medical fitness for work assessments provided to wind turbine technicians and other personnel who may need to work access and climb a wind turbine.

4. MEDICAL FITNESS FOR WORK:

The primary purpose of a medical fitness assessment for work is to ensure that an individual is fit to perform the work/task they are required to carry out without putting their own or others (e.g. work colleagues) health and safety at risk. This should include an Individual's condition:

- a. Limiting, reducing or preventing them from performing a job effectively (e.g. musculoskeletal or cardio-respiratory conditions restricting the ability to climb a turbine, work in a confined space or in hot conditions);
- b. Being made worse by a job (e.g. cardiac conditions exacerbated by physical exertion);
- c. Making certain jobs/tasks unsafe (e.g. potential loss of consciousness and the risks associated with falls from height); or
- d. Ensuring there are no underlying medical conditions that could compromise the safe emergency rescue of the individuals or colleagues. (e.g. emergency rescue in remote locations and offshore).

5. PRE EMPLOYMENT MEDICAL CHECK UP:

A pre-employment medical check- up for all our personnel at project / site shall be conduct and their records kept prior to the employment. Annual medical check-up shall be conduct.

a. PRE-WORK FITNESS ASSESSMENT BY SUPERVISOR

Where feasible, the individual who intends to climb wind turbine towers should be asked a few simple health questions by their Supervisor. These would deal with recent new medication, alcohol consumption and current illness.

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b. PRE-EMPLOYMENT MEDICAL HEALTH CHECK UP FOR HEIGHT WORKERS SHALL INCLUDE:

1. Blood Test
 - I. Blood Group
 - II. Blood Urea
 - III. Blood Sugar Random
 - IV. Hemogram
1. Serum Creatinine Test
2. Blood Pressure
3. X-ray Chest
4. ECG
5. Vision Test
6. Locomotors System
7. Cholesterol

c. The above list shall also comprise of annual health check-up of employees of site.

8. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head – GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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HEALTH CERTIFICATE

Pre employment

After Examination, I do hereby certify that

Mr./Mrs./Miss.....

S/O, D/O Mr.....

Being employed through (Name of company/contractor).....

As an employee/contract worker in **Inox Green Energy Services Ltd.** & He is found to be medically.

Fit/Unfit..... For the same.

The candidate's date of birth / Age :

Identification Marks:.....

I have further to certify the following findings on medical examination

Ht..... Cms. Wt.....Kgs.

BMI.....

Pulse/Min..... BP:mmHg

Respiration Rate/Min.....

Vision

Distant: RE..... LE.....

Near: RE..... LE.....

Colour

Vision.....

Hearing:.....Oral cavity.....

Any Ear disease.....

CVS:.....

RS:.....

CNS:.....

Musculoskeletal System:.....

H/O:- Vertigo.....

H/O Convulsions.....

Past H/O Major Medical or Surgical Illness/ Treatment.....

.....

.....

Lab. Inv.

1) HB%.....GM%.....

2) Blood Group & RH factor

REMARKS:

.....

Place:

Date:

Signature/Thumb Impression of Candidate

Signature with seal of Med.Officer.

HEALTH CERTIFICATE

Pre employment

After Examination, I do hereby certify that

Mr./Mrs./Miss.....

S/O, D/O Mr.....

Being employed through (Name of company/contractor).....

As an employee/contract worker in **Resco Global Wind Services Pvt. Ltd.** & He is found to be medically.

Fit/Unfit..... For the same.

The candidate's date of birth / Age :

Identification Marks:.....

I have further to certify the following findings on medical examination

Ht..... Cms. Wt.....Kgs.

BMI.....

Pulse/Min..... BP:mmHg

Respiration Rate/Min.....

Vision

Distant: RE..... LE.....

Near: RE..... LE.....

Color Vision.....

Hearing:.....Oral cavity.....

Any Ear disease.....

CVS:.....

RS:.....

CNS:.....

Musculoskeletal System:.....

H/O:- Vertigo.....

H/O Convulsions.....

Past H/O Major Medical or Surgical Illness/ Treatment.....

.....

.....

Lab. Inv.

1) HB%.....GM%.....

2) Blood Group & RH factor

REMARKS:

.....

Place:

Date:

Signature/Thumb Impression of Candidate

Signature with seal of Med.Officer.

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	FIRST AID / MEDICAL TREATMENT / RESCUE	Guideline No IGESL SITE/HSE/013
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1. SCOPE:

In the event of accident, all possible effort to keep on lookers from the scene must be made. The only employees required in such areas are directly engaged in assisting that in the emergency. It is known that the quicker the first aid treatment is given, the less impact the injury will have on the patient. For more serious injuries, the purpose of first aid is to maintain the injured in a stable condition until professional help arrives.

2. AIMS OF FIRST AID:

- a. To sustain the life of the casualty.
- b. To prevent his condition from deteriorating.
- c. To prevent the occurrence of further injuries.
- d. To prevent contamination.
- e. To seek medical help.

3. SHOCK:

Shock: Insufficient blood supplies to the brain, which controls the system of the body vital organ. The signs and symptoms of shock are;

- a. **Skin:** Pale, cold & clammy.
- b. **Breathing:** Rapid & Shallow.
- c. **Pulse:** Rapid & weak, Fainting & Dizziness.
- d. **Unconsciousness (Sometimes).**
- e. Any person who has suffered a severe injury or even someone who has narrowly escaped injury is likely to be suffering from shock.
- f. It is essential that persons administering first aid be aware of the symptoms of shock and take action to treat these symptoms in addition to the other injuries sustained.
- g. First Aid for Shock are as follow;
 - i. Lay the person down on his back, and raise the lower limbs.
 - ii. Cover him with blanket.
 - iii. Loosen clothing on neck, chest & waist.
 - iv. Do not give any thing by mouth.
 - v. In case of Heart Attack, keep in setting position.
 - vi. Get medical help.

4. ARTIFICIAL RESPIRATION:

- a. Electric shock, gassing, drowning, or suffocation may cause breathing to stop.
- b. In absence of normal breathing, artificial respiration is needed to ventilate the lungs in an attempt to restore the normal function of the lungs / to put oxygen into the blood stream and to remove carbon dioxide from the blood stream.
- c. The technique to be used by mouth to mouth ventilation or by mouth to nose ventilation by Maintaining head tilt, chin-left position.
- d. For the above techniques, you must deliver breaths to the patient at one breath every five seconds, at the rate of twelve breaths per minute.

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- e. Artificial respiration must be started immediately and continued until the patient recovers or until professional medical aid takes over. If you are alone, do not leave the patient to seek help until his normal breathing has resumed.

5. INJURIES:

A. CHEMICALS

- a. Actions to be taken in the event of worker accidentally comes into physical contact with dangerous chemicals are as follows.
- b. If splashed by chemical, goggles should be left in place until chemicals have been washed off. Unless chemicals have entered the eyes under the goggles, eye protection should be removed only after the chemicals have been washed from the surrounding area.
- c. The eyes should be washed with clean water for at least 15 minutes. Chemicals on the skin should be washed off with water using a safety shower where available. When it is necessary to remove clothing, it should be removed while under shower or water spray medical attention is essential in their cases.

B. HEAD INJURIES:

- a. Act in cases of head injury is to get the patient under medical care without delay.
- b. No head injury should be regarded lightly. Every patient who has had even a mild injury to the head is liable to develop complications that can be serious. Treatment shall be as follows.
 - i. Loosen all tight clothing around neck, check & waist.
 - ii. Check to see if patient is breathing and initiate artificial breathing if required.
 - iii. Ensure that his throat and air passages are clear of secretions, foreign material and loose teeth
 - iv. Check for other injuries.
 - v. Arrange Ambulance or other transport facility for the patient to be carefully transported to a hospital.

C. BLEEDING:

- a. Every effort should be made to stop bleeding by direct pressure such as by applying a sterilized pad or dressing.
- b. Elevate the bleeding part & support in position unless fracture is suspected.
- c. If bleeding continues, apply further dressing.
- d. Hold firmly the pressure points, if necessary above the wound.
- e. The wound should be firmly bandaged. Applying mild pressure on the artery between the wound and the heart may control arterial bleeding.

D. FRACTURES:

- a. Where a fracture is suspected, the limb must be immobilized. The injured part should be elevated to reduce discomfort and swelling if possible.
- b. Fracture of the spine or pelvis must be treated with great care.
- c. The casualty must not be moved, but should be covered with a blanket and made comfortable.

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Competent ambulance employee should only remove him.

- d. Signs & symptoms of fracture are;
 - I. Tenderness and pain.
 - II. Swelling & Discoloration.
 - III. Deformity.
- e. First aid for fracture is as follows;
 - i. Support the lower and upper joint of the injured part with a splint.
 - ii. Don't try to straighten or repair the fracture part.
 - iii. If the patient is unconscious as a result of head or back blows, treat as a spinal injury.
 - iv. Special care to be taken for head or spinal injuries.
 - v. Call for medical help.

E. MINOR WOUNDS:

a. GAPING ABDOMINAL WOUNDS

- i. Gently replace protruding organs.
- ii. Call a physician. Follow the next steps only if professional treatment is not available..
- iii. Cover with a damp dressing.
- iv. Hold the dressing firmly in place with a bandage. The object is to control bleeding with a pressure dressing; the bandage should be firm but not tight.

b. DEEP CHEST WOUNDS

- i. Prevent air from passing through the wounds. The lungs will collapse unless this is done.
- ii. Place a gauze or cloth pad over the wound.
- iii. Hold the pad in place with firm pressure.
- iv. A belt drawn snugly around the chest should be effective in holding the wound closed.
- v. The band around the chest should not unduly restrict breathing.
- vi. All minor wounds, cuts, and scratches should be attended to immediately, as delay increases the risk of infection.
- vii. The wound should be cleaned and then covered with a sterilized dressing or adhesive plaster. If the injury become painful, or is inflamed, medical attention should be obtain

c. IF THE VICTIM IS UNCONSCIOUS

- i. Do not move the victim unless absolutely necessary until professional help arrives.
- ii. Do not give anything by mouth.
- iii. Keep victim lying down and quiet if he regains consciousness
- iv. Keep the victim warm if the weather is cold.

d. HEAT EXHAUSTION

I. SYMPTOMS

- 1) Pale and clammy skin.
- 2) Pulse rapid and weak.
- 3) Victim complains of weakness, headache or nausea.

II. WHAT TO DO?

- 1) Have the victim lie down with his head lower than his body.
- 2) Move the victim to a cool place but protect him from chilling.

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- 3) Give the victim salt water (1 teaspoon common salt dissolved in 1 quart of water) to drink.
- 4) Call a physician.

e. HEAT STROKE

Some of our locations are based in western India i.e. hot area So extra efforts to be implemented towards individuals and company level.

I. SYMPTOMS

- 1) Rushed and hot skin.
- 2) Pulse rapid and strong.
- 3) Victim often is unconscious.

II. WHAT TO DO?

- 1) Call a physician.
- 2) Cool the body by sprinkling cold water or by cold applications.
- 3) If the victim is fully conscious and can swallow, give him salt water to drink.
- 4) DO NOT GIVE ALCOHOL IN ANY FORM

6. FIRST AID EQUIPMENTS:

A. FIRST AID BOXES:

- a. First aid boxes and first aid equipment must comply with local legal requirements. It should be located at strategic points e.g. WTG (top & bottom),GSS, guest houses, vehicles, store, office buildings, guard rooms and every major work places.
- b. The first aid box should be regularly checked by the Safety officer for completeness and for replacement of out-of-date materials.
- c. A booklet shall also be kept in the first aid box detailing basic first aid techniques.
- d. A list of qualified first aiders and nearby hospitals should also be pasted / stuck on the wall / kept near first aid box.

B. EYE WASH AND EMERGENCY SHOWERS:

- a. Emergency showers shall be provided in all areas where acids or other corrosive substances are handled. Similar precautions against overheating or freezing, as above, should be observed. Emergency showers should be tested weekly and always before any work involving the handling of acids or corrosive liquids. Defects shall be reported immediately to the Safety officer.
- b. Eye baths can stand alone or are incorporated as part of an emergency shower. Due to the high ambient temperatures experienced in some locations, water feed lines to eye baths that are exposed to direct sunlight should be insulated.

C. EMERGENCY TOOL KIT / RESCUE KIT / EMERGENCY VEHICLE

An emergency tool kit detailing various sizes etc. of tools and rescue equipment should be considered for wind project sites.

Every site must equip with emergency vehicle till end of the job to mitigate an emergency.

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D. TRAINING:

- a. There shall be a continuous program of first aid training given by qualified persons or recognized institutions. Such training should ensure that there is adequate first aid proficiency available! Locally to work stations at all times.
- b. Records should be kept of training given and the development of proficiency. Training by some recognized authorities does permit certificates to be issued.
- c. Internal training on first aid to worker by the qualified first aiders shall be undertaken with normal training programs.

E. OUTSIDE MEDICAL SUPPORT:

- a. In case of an emergency that involves injured personnel, outside medical support will be required. Contact with relevant medical authorities has to be established and they have to be invited to participate in regular emergency drills in order to get familiarized with the wind site and the particular hazards.
- b. Name & Telephone numbers of these installations (outside medical services) must be prominently displayed at least in the control room, first aid boxes and the office building. Normally, these numbers shall be included in the Emergency Contact List.

F. FIRST AID CENTER & MEDICAL FACILITY:

First Aid Centre with Medical Assistant shall be established at the site with the required medical facilities and medicines. It shall contain items as per needs & factory rule.

G. PRE EMPLOYMENT MEDICAL CHECK UP:

We shall arrange to conduct a pre-employment medical check- up for our entire personnel at project site and keep their records prior to the employment. We shall also need to record periodical medical check-up for the following categories persons. Drivers / operators/casuals/Canteen workers (Check for vision & hearing)

- i. Equipment Operators (Check for vision & hearing)
- ii. Height Workers (Check for vision, Hearing, Vertigo & Height Phobia etc.)
- iii. Persons handling the dangerous substances (After effect of chemical substance contact).

7. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Doc. No. IGESL/HSE/F-54/ Rev.05 Annexure: 13.1 Date: 01.04.2022		Analysis of First Aid Cases			
Date		Project / Site		Location	
Sl. No	Grouping of cases based on Causatives			No. of Cases	
1	Fall From height				
2	Slip & fall on level				
3	Fall into depth				
4	Fall of materials				
5	Pressed between objects				
6	Hit by objects				
7	Breaking of grinding wheel				
8	Contact with moving grinding wheel				
9	Contact with moving parts of the machinery				
10	Injury in body part due to stuck in machinery				
11	Struck against object				
12	Road accident (vehicle / equipment)				
13	Electric shock				
14	Electric burn				
15	Contact with hot objects				
16	Burn injury due to fire				
17	Chemical burns				
18	Foreign body in eye				
19	Welding flash in eye				
20	Injury during climbing/ lowering on tower				
21	Asphyxia (suffocation)				
22	Explosion				
23	Blasting of detonator				
24	Defective tools / wrong tools				
25	Drowning				
26	Others				
			Total		

Report Prepared By (HSE)_____

Doc. No. RESCO/HSE/F-54A/ Rev.05 Annexure: 13.1 Date: 01.04.2022		Analysis of First Aid Cases			RESCO GLOBAL WIND SERVICES PVT. LTD.
Date		Project / Site		Location	
Sl. No	Grouping of cases based on Causatives			No. of Cases	
1	Fall From height				
2	Slip & fall on level				
3	Fall into depth				
4	Fall of materials				
5	Pressed between objects				
6	Hit by objects				
7	Breaking of grinding wheel				
8	Contact with moving grinding wheel				
9	Contact with moving parts of the machinery				
10	Injury in body part due to stuck in machinery				
11	Struck against object				
12	Road accident (vehicle / equipment)				
13	Electric shock				
14	Electric burn				
15	Contact with hot objects				
16	Burn injury due to fire				
17	Chemical burns				
18	Foreign body in eye				
19	Welding flash in eye				
20	Injury during climbing/ lowering on tower				
21	Asphyxia (suffocation)				
22	Explosion				
23	Blasting of detonator				
24	Defective tools / wrong tools				
25	Drowning				
26	Others				
Total					

Checklist for recommended Items in First aid Kit

Name of Site	
Location of F. Aid Box/ Vehicle No.	
Date of Inspection	

First Aid box Contents List

Sr.No	Item Description	Unit	Quantity in each box.	Status Available/Not Available /Expired	Remark
1	Cotton Roll – 20 gms.	No.	1		
2	Bandages of Size 2" & 3".	Packet	1 each		
3	Antiseptic ointment	(15	1		
4	Adhesive Dressing Strips (Band-Aid).	Strip	20		
5	Antiseptic solution/Savalon (50 / 100 ml)	No.	1		
6	Simple Tourniquet	No.	1		
7	Straight Scissor (small)	No.	1		
8	Antihistaminic cream – 25 ml (Calamine	No.	1		
9	Sterile Dressing pads of different Size	Set	2 Each		
10	Triangular bandage with safety pins	No.	1		
11	ORS (Oral Rehydration Solution)	No.	2		
12	Paracetamol – 500 mg(10 tablet strip)	Strip	1		
13	Elastic crepe bandage 10 cm x 4 meters	Meters	1		

Norms:-

- ☑ Keep the first aid kit in a dry, cool location.
- ☑ Make sure the first aid kit is easily accessible and known to location/site/office workplace.
- ☑ Some items, are with expiry dates. Check regularly and replace as necessary.
- ☑ If an item is used from the first aid kit, promptly replace it.
- ☑ Note expiry dates of the items replaced periodically on this paper.
- ☑ Please maintain these useful details in each First Aid Box.

Inspection Result & Remark:- **If any material not available/ Expired, Immediately refill the First aid Box.**

Checked By :-	
Designation :-	
Signature	

Doc. No. RESCO/HSE/F-55A/Rev. 05 Annexure: 13.2 Date: 01.04.2022		Checklist for recommended Items in First aid Kit		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Name of Site					
Location of F. Aid Box/ Vehicle No.					
Date of Inspection					
First Aid box Contents List					
Sr. No	Item Description	Unit	Quantity in each box.	Status Available/ Not Available	Remark
1	Cotton Roll – 20 gms.	No.	1		
2	Bandages of Size 2" & 3".	Packet	1 each		
3	Antiseptic ointment	(15	1		
4	Adhesive Dressing Strips (Band-Aid).	Strip	20		
5	Antiseptic solution/Savlon (50 / 100	No.	1		
6	Simple Tourniquet	No.	1		
7	Straight Scissor (small)	No.	1		
8	Antihistaminic cream – 25 ml	No.	1		
9	Sterile Dressing pads of different Size	Set	2 Each		
10	Triangular bandage with safety pins	No.	1		
11	ORS (Oral Rehydration Solution)	No.	2		
12	Paracetamol – 500 mg(10 tablet strip)	Strip	1		
13	Elastic crepe bandage 10 cm x 4 meters	Meters	1		
Norms:- ☐ Keep the first aid kit in a dry, cool location. ☐ Make sure the first aid kit is easily accessible and known to location/site/office workplace. ☐ Some items, are with expiry dates. Check regularly and replace as necessary. ☐ If an item is used from the first aid kit, promptly replace it. ☐ Note expiry dates of the items replaced periodically on this paper. ☐ Please maintain these useful details in each First Aid Box. Inspection Result & Remark:- If any material not available/ Expired, Immediately refill the First aid Box.					
Checked By :-					
Designation :-					
Signature					

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	STORE SAFETY	Guideline No IGESL SITE/HSE/014
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1. SCOPE:

Good management of store is an important element of various type accident prevention. It should be planned with the beginning of establishment of wind power project to continue throughout the O & M activities.

2. PURPOSE:

Management of Store shows organizational behaviour and approach about “NEAT AND CLEANLINESS” of an industry. With this philosophy keeping in mind our organization serve this manual for better way of store safety management.

3. HAZARDS:

The relationship between accidents and poor safety management is very close. Too often accidents are reported in store area because of:

- a. Improper storage and stacking of flammable materials.
- b. Fire due to electrical short circuits
- c. Slippery due to greasy, wet, or dirty floors
- d. Fall of materials due to poor housekeeping
- e. Chemical vapours inhalation (like Gasoline, Degreaser, Thinner, Solvents etc.)
- f. Cut, abrasion and other body injuries
- g. Electrical shock or electrical hazards
- h. Bites of snake and other reptiles
- i. Injury to body cause of unsafe loading/ unloading activities (crane or manually)
- j. Fall due to improper approach / ladder used
- k. Dusty atmosphere in high wind season
- l. Discarded objects, including cables, clothing and packaging
- m. Loose carpeting or cracked flooring
- n. Poor lighting

4. CLASSIFICATION OF STAGES FOR STORE SAFETY AT WIND SITES:

- a. Mobilization stage
- b. Construction & erection stage
- c. Operation& Maintenance stage

5. GENERAL SAFETY PROVISION:

Lighting Provision:

The whole store area including inside store, store office, scrap yard, store yard should have adequate illumination of minimum 20 lux

Work Area:

Loose materials, waste, etc., shall be cleaned immediately. This shall be especially important in aisles and in the vicinity of ladders, ramps, stairs and machinery. Tools and loose material shall be removed immediately if a hazard is created.

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Area Used by personnel:

Empty bottles, containers and papers shall not be allowed to accumulate where lunches are eaten on the job site. Waste disposal storage shall be provided.

Oil and Grease:

Spills of oil, grease or other liquid shall be removed immediately or sprinkled with sand, tray must be provided for storage of flammable liquid.

Disposal of Waste:

An effective means of preventing litter is the provision of suitable receptacles for waste, scrap, etc. Combustible waste, such as oily rags, paper etc. shall be stored in a safe place such as covered metal container and disposed of regularly.

Waste management i.e. generation, storage, and disposal should be as per statutory requirements and **State Pollution Control Board** norms.

Protruding Nails:

Protruding nails shall either be removed or bent over; this shall be done as this hazard develops.

Lifting of Materials:

- a. Crane operation, banking, slinging and signalling shall be performed in the supervision of competent persons.
- b. The records of lifting activities shall be kept at wind site.
- c. Safe lifting procedure & checklist shall be adopted before every lift which is above 2MT.
- d. Only authorised crane operator, riggers and signallers, shall be engaged for the job.
- e. Job shall done under dedicated Lifting and Rigging supervisor with responsibilities for:
 - i. Assessing the competence of crane operators, banks men and riggers,
 - ii. Lifting gears shall be inspected by competent person periodically.
 - iii. Monitoring lifting operations on the work site, especially the performance of crane operators, riggers and banks men.
- f. Job shall done under dedicated Lifting and Rigging Superintendent with responsibilities for:
 - i. Assessing the competence of crane operators, and riggers,
 - ii. Lifting gears shall be inspected by competent person periodically.
 - iii. Monitoring lifting operations on the work site, especially the performance of crane operators, riggers and banks men.

6. HOUSE KEEPING:

Good housekeeping is an important element of accident prevention. It shall be of primary concern to all engineers and supervisors. Good housekeeping shall be planned at the beginning of the job and carefully supervised and followed to the final clean up. Housekeeping shall be the concern of all supervisors and each workman, and not left for any special group. Working will be more efficient when the work area is neat and orderly at all times.

a. Stock of materials:

- i. All materials should be maintained in a neat stockpile with well-laid aisle and walkways for ease of access. There shall not be any projections in the walkways.
- ii. A minimum of 1 Mtr. shall be maintained between for the passages.

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- iii. All the materials should be stacked on the leveled ground,
- iv. Before stacking Heavy Materials stability of the soil, bearing and adjacent to it should be considered.
- v. Proper arrangements of unused and outdated materials and its records to be maintained by store employees.
- vi. All the materials should be stacked, providing good aisles between them for receiving the materials,
- vii. While stacking materials on the passage, care should be taken, to avoid protruding of sharp particles, while stacking the similar materials as a heap, the height of the Stacking should not increase, more than 1.5 Mtrs. If the base dimension is not 4 times of the Height and Proper Access is not being provided.
- viii. While stacking flammable materials or materials coated with flammable coating or containing flammable materials, care should be taken to avoid fire accident.
- ix. Volatile chemicals not to be stored in open area, it may cause of major accident.
- x. While stacking pipes, 3 Types of Stacking of Stacking should be followed,
 - I. Pyramid Stacking
 - II. Square Stacking
 - III. Parallel Stacking
- xi. Pipe should be stacked, on a level ground, to avoid rolling of the pipes, roll arrester and wedge shaped stoppers should be provided, at the end of each layer,
- xii. While stacking pipe, manufactures recommendation should be considered seriously, for no. Of layers allowed.
- xiii. Bins shall be formed for every item, and all the materials shall be stacked properly in the concerned bins for easy, accountability and easy retrieving of the materials.

b. Stacking materials in the racks:

- i. While stacking materials in racks, heavier materials should be stored at the bottom and the lighter material should be at the top.
 - I. Distance between the racks shall be sufficient for retrieving the materials.
 - II. Maximum weight caring capacity of each rack should be displayed on itself.
 - III. Ladders shall be provided to retrieve the materials from the top racks.
- ii. Materials shall be stacked in such a manner as will permit their de-stacking safely. The aspects, which shall be taken into account when stacking or destocking materials include:

c. GENERAL SAFETY CONSIDERATIONS DURING STORE OPERATION:

The store involved in major activities in the construction and the operational phase in wind projects so requiring additional safety intervention are presented below:

- i. Fully supervision in Transportation, Loading and unloading of heavy material (like nacelle, blades, transformers, WTG tower segments etc.)
- ii. Proper stock and availability of Portable Fire Fighting Extinguisher.
- iii. Availability of First Aid Boxes in WTG (Top and Bottom) in O & M activities as well as in construction & erection phase.
- iv. Proper stocking with tag of each material for convenience to individuals and other employees.
- v. Maintain proper stock & availability of Personal Protective Equipment's jointly with HSE representative and keep its records.

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- vi. Relevant Inward and outward documents to check tools & tackles and PPE's before initiating any work activity.
- vii. Proper fire fighting arrangements should available in store yard.
- viii. Proper use of specific PPE's when handling the materials in store area.

d. MATERIAL SAFETY DATA SHEET (MSDS)FOR HAZARDOUS MATERIALS

In the interest of protecting the Safety, Health & Environment affecting the workers / employees and the general public, a material safety data sheet for all the potentially hazardous materials is retained by the Safety Officer with the help of store in charge and made available at wind site locations. It covers details about the hazardous substance Handling, Transportation and Storage and mitigating measures in the event of spill, fire or other untoward occurrence. HSE Officer disseminates the hazard and precaution and remedial measures to all the employees in the wind project.

- I. MSDS-Identification of the product
- II. **Flammable:** ANY substance easily ignited and quick burning, including liquids with a flash point below 95 degrees Fahrenheit.
- III. **Toxic:** ANY substance (alone or via chemical reaction) able to cause harm/produce injury to the body through **absorption, ingestion, inhalation, or injection.**

Flash point: The lowest temperature at which a liquid produces enough vapors to ignite.

- I. UEL-The upper explosive limit (UEL) is the highest concentration of gas, vapour or mist in the air at which an explosion may arise if the substance is ignited.
- II. LEL-The Lower Explosive Limit (LEL) is **the lowest concentration of a gas or vapour that will burn in air.**
- III. **TLV—Threshold Limit Value** is a recommended limit for chemical substance exposures, similar to the PEL but most often more restrictive than the PEL.
- IV. **TWA—an 8-hour Time-Weighted Average** is the concentration the average worker can be exposed during an 8-hour workday, day after day, without harmful effects.
- V. **STEL— “Short Term Exposure Limit”** is a 15 minute period.
- VI. Lethal Dose **LD** is the amount of a substance that, when administered by a defined route of entry (e.g. oral or dermal) over a specified period of time, is expected to cause the death of 50% of a defined animal population.
- VII. Lethal Concentration (**LC**) is the amount of a substance in air that, when given by inhalation over a specified period of time, is expected to cause the death in 50% of a defined animal population.

READING THE MSDS—

Identity -The chemical name, trade name and manufacturers name, address and emergency phone number can be found here.

Ingredients -Includes: substance, % content,.

Hazards Identification -Dangers for humans and the environment such as: Most important hazards & Specific hazards

First Aid -Gives instructions on what to do in case of eye contact, skin contact or ingestion

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	STORE SAFETY	Guideline No IGESL SITE/HSE/014
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Fire fighting -Suitable extinguishing media, Unsuitable extinguishing media, Special hazards in fire, required special protective equipment for fire-fighters

Accidental Release Measures/Spill Clean-up- Personal precautions, Environmental precautions, Methods for cleaning

Handling and Storage Exposure Controls and Personal Protection -Information on proper PPE to use, how to store and temperature limits

“Place for everything and everything in its place”

7. POWER TO AMEND:

- a.** Any change of the manual shall be approved by the Head - GCHR.
- b.** The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Project / Location:

Date:

Sl. No.	Description	Observation Yes / No	Remarks
A.	ACCESS TO STOCKED MATERIAL		
01	Proper access provided to all racks / storage		
02	Access maintained properly / not blocked		
03	Ladder provided to reach elevated rack		
04	Ladder is in good condition / properly maintained		
B.	ELECTRICAL SOURCE / LIGHTING		
01	Lights / fasting / switches / out lets intact		
02	Sources are identified		
03	Panel board is properly maintained		
04	All sources are grounded properly		
05	Power sources for maintenance provided with ELCB		
06	Extension cable are in good condition		
08	Sufficient illumination		
C.	FIRE FIGHTING EQUIPEMENT		
01	Fire extinguishers are placed in designated locations		
02	Access not blocked		
03	Inspection carried out		
04	Water available		
D.	HOUSE KEEPING		
01	Waste bin provided		
02	Wastes removed / Disposed regularly		
03	Surrounding areas kept clean		
E.	FIRST AID		
01	First aid box provided		

Store in-charge _____

Safety In-Charge_____

STORE SAFETY INSPECTION CHECKLIST

RESCO GLOBAL WIND
SERVICES PVT. LTD.

Project / Location:

Date:

Sl. No.	Description	Observation Yes / No	Remarks
A.	ACCESS TO STOCKED MATERIAL		
01	Proper access provided to all racks / storage		
02	Access maintained properly / not blocked		
03	Ladder provided to reach elevated rack		
04	Ladder is in good condition / properly maintained		
B.	ELECTRICAL SOURCE / LIGHTING		
01	Lights / fasting / switches / out lets intact		
02	Sources are identified		
03	Panel board is properly maintained		
04	All sources are grounded properly		
05	Power sources for maintenance provided with ELCB		
06	Extension cable are in good condition		
08	Sufficient illumination		
C.	FIRE FIGHTING EQUIPEMENT		
01	Fire extinguishers are placed in designated locations		
02	Access not blocked		
03	Inspection carried out		
04	Water available		
D.	HOUSE KEEPING		
01	Waste bin provided		
02	Wastes removed / Disposed regularly		
03	Surrounding areas kept clean		
E.	FIRST AID		
01	First aid box provided		

Store in-charge _____

Safety In-Charge_____

Doc. No. IGESL/HSE/F-57/Rev. 05 Annexure: 14.2 Date: 01.04.2022	INOX GREEN ENERGY SERVICES LIMITED HOUSE KEEPING INSPECTION CHECK LIST	
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Project : _____		Location: _____		
Checked By: _____		Date : _____		
S. No.	DESCRIPTION	Observation		Remarks
		Yes	No	
1	Area and roads kept clear for maneuvering of cranes and material handling equipment			
2	Scrap, cut-pieces, welding electrode stubs, hand-tools kept tidy in work area and disposed suitably.			
3	Scrap bin available at site.			
4	Welding cables, power cables routed properly to avoid run-over by vehicle or tripping hazards and obstruction to personnel movement.			
5	Compressed gas hoses routed properly in the site.			
6	Compressed gas cylinders and hoses kept away from hot work and grinding work.			
7	At least 1 meter on both sides of gantry rails are kept clear of material			
8	Floor kept clear of water, oil spillage/ accumulation.			
	Construction Work Area			
1	All approach, aisle, ingress/egress to/from site, ramps, walkways kept clear of material debris tools etc.			
2	Concrete materials, shuttering boards, across pans etc. are stacked properly at site.			
3	Stacking of bricks, hollow blocks are done in safe manner.			
4	Nails removed from wooden planks / timber and not protruding out.			
5	Saw dust, wood chips and scrap wood cleared from carpentry shop and disposed suitably			
6	Debris from demolition and excavated earth cleared from site and accesses.			
	Electrical Installations & Booths			
1	Approach to Panels, Switches kept clear.			
2	Fire extinguishers installed at an easy accessible location.			
3	Welding cables and power cables are routed separately.			

4	Routing of cables is done properly to avoid obstruction & tripping hazards.			
5	Floor of electrical booths kept dry.			
6	Rubber mats are in place at electrical panels.			
S.No.	DESCRIPTION	Observation		Remarks
		YES	NO	
	Stores			
1	Walkways, entry and exits kept clear.			
2	Material placed on racks is safely accessible.			
3	Compressed gas cylinders are segregated as full or empty and type of gas.			
4	Vertically stored cylinders are secured / chained to avoid toppling and horizontal cylinders guarded against rolling down.			
5	Flammables storage areas are isolated from store, office and work areas.			
6	Cement bags are stacked in proper gradient safely.			
7	Corrosive materials (e.g. acids, alkalis) are stored away from other material and kept on collection trays to safeguard against accidental leakage.			
8	Storing area for lifting tools & tackles, ropes, wire ropes & personal protective equipment is dry, clean & free of corrosive material.			
9	Easy accessibility to installed fire extinguishers ensured in store.			
	General			
1	Separate scrap yard is allocated for the site.			
2	Approaches to workstations, offices, time offices, stores, are well laid and demarcated.			
3	Site roads are kept clear of stacked material for free & safe vehicular movement.			
4	Heavy material stacking is taken care of to prevent slips, collapse and rolling.			

INSPECTED BY : NAME : _____

SIGNATURE: _____

Doc. No. RESCO/HSE/F-57A/Rev. 05 Annexure: 14.2 Date: 01.04.2022	HOUSE KEEPING INSPECTION CHECK LIST	RESCO GLOBAL WIND SERVICES PVT. LTD.
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Project : _____		Location: _____		
Checked By: _____		Date : _____		
S.No.	DESCRIPTION	Observation		Remarks
		Yes	No	
1	Area and roads kept clear for maneuvering of cranes and material handling equipment			
2	Scrap, cut-pieces, welding electrode stubs, hand-tools kept tidy in work area and disposed suitably.			
3	Scrap bin available at site.			
4	Welding cables, power cables routed properly to avoid run-over by vehicle or tripping hazards and obstruction to personnel movement.			
5	Compressed gas hoses routed properly in the site.			
6	Compressed gas cylinders and hoses kept away from hot work and grinding work.			
7	At least 1 meter on both sides of gantry rails are kept clear of material			
8	Floor kept clear of water, oil spillage/ accumulation.			
	Construction Work Area			
1	All approach, aisle, ingress/egress to/from site, ramps, walkways kept clear of material debris tools etc.			
2	Concrete materials, shuttering boards, across pans etc. are stacked properly at site.			
3	Stacking of bricks, hollow blocks are done in safe manner.			
4	Nails removed from wooden planks / timber and not protruding out.			
5	Saw dust, wood chips and scrap wood cleared from carpentry shop and disposed suitably			
6	Debris from demolition and excavated earth cleared from site and accesses.			
	Electrical Installations & Booths			
1	Approach to Panels, Switches kept clear.			
2	Fire extinguishers installed at an easy accessible location.			
3	Welding cables and power cables are routed separately.			

4	Routing of cables is done properly to avoid obstruction & tripping hazards.			
5	Floor of electrical booths kept dry.			
6	Rubber mats are in place at electrical panels.			
S.No.	DESCRIPTION	Observation		Remarks
		YES	NO	
	Stores			
1	Walkways, entry and exits kept clear.			
2	Material placed on racks is safely accessible.			
3	Compressed gas cylinders are segregated as full or empty and type of gas.			
4	Vertically stored cylinders are secured / chained to avoid toppling and horizontal cylinders guarded against rolling down.			
5	Flammables storage areas are isolated from store, office and work areas.			
6	Cement bags are stacked in proper gradient safely.			
7	Corrosive materials (e.g. acids, alkalis) are stored away from other material and kept on collection trays to safeguard against accidental leakage.			
8	Storing area for lifting tools & tackles, ropes, wire ropes & personal protective equipment is dry, clean & free of corrosive material.			
9	Easy accessibility to installed fire extinguishers ensured in store.			
	General			
1	Separate scrap yard is allocated for the site.			
2	Approaches to work stations, offices, time offices, stores, are well laid and demarcated.			
3	Site roads are kept clear of stacked material for free & safe vehicular movement.			
4	Heavy material stacking is taken care of to prevent slips, collapse and rolling.			

INSPECTED BY : NAME : _____

SIGNATURE: _____

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ROAD SAFETY (TRAVEL & TRANSPORTATION)	Guideline No IGESL SITE/HSE/015
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1. PURPOSE:

WIND SITES gives a high value on its people, their, families, friends and the road using community and as a result is committed to raising awareness of vehicle and road safety amongst employees and contractors.

2. OBJECTIVE:

The objective of this guideline is to ensure that:

- All employees consider road safety a vital part of successful performance of their job.
- All employees and contractors have the road safety knowledge and skills to carry out their work safely.
- All WIND SITES vehicles are safe and correctly maintained.
- All vehicle accidents are reported and investigated.

3. SCOPE:

a. The procedure covers:

- All WIND SITES employees.
- All two wheelers and four wheelers owned or hired by WIND SITES.

All persons covered by this procedure shall abide by the rules of the road. In particular this includes the rules related to driving in intoxicated condition, wearing of seatbelts, speed control and the use of mobile phones while driving. All such rules must be obeyed.

b. Strategies shall cover the following areas

- Driver Induction**— explaining this procedure, driver responsibilities and verifying the correctness a validity of Driver's License etc.
- Driver Experience**—Provisional Pass (Learner) drivers should not operate vehicles/heavy duty vehicles.
- Alcohol, Drugs or Mobile Phone**—Compliance with rules of the road. Anytime should a person drive a vehicle if under the influence of alcohol, Drugs, and use of mobile phone?
- Eyesight**—Drivers who wear prescription glasses are required to wear them whilst driving.
- Physical fitness**—Driver must be physically fit certified from MMBS/MD doctors.
- Vehicle Speed** – Drivers shall not drive vehicle beyond the speed of 40km/hour.
- Fatigue**—All employees/drivers should be aware of the effects of fatigue on the ability to operate a vehicle. Drivers and Employees should take into account driving timing and distances following completion particular journey.
- Fitness for work** – Before operating a vehicle, employees should ensure that drivers are capable of driving. Factors to consider are fatigue, personal injuries, eyesight and ill health.
- Adapt to Conditions**—WIND SITES employees/drivers must check road conditions prior to departure and drive accordingly. Follow all road signs in Plains & Hill roads. Park the vehicles in proper places (safe distances from excavated pit, hill edges or corners etc.).

While parking at night ensure proper indication is followed.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ROAD SAFETY (TRAVEL & TRANSPORTATION)	Guideline No IGESL SITE/HSE/015
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2. INCIDENT REPORTING AND INVESTIGATION:

All accidents and near misses shall be investigated.

Ensure all road accidents are to be reported within 12 hours of accident. WIND SITES Management has the discretion to further investigate any accident.

3. VIOLATION:

In the case where an employee/driver caught in driving offence of Vehicle & Road safety covered by this procedures shall apply the following:

For first offence: Administration in charges/Site in charges is required to discuss the infringement with the employee/ driver.

- a. For second offence: The employee/driver to be counselled by Administration in charges/Site in charges.
- b. For third offence: The employee/driver to be counselled by Administration Head/Functional Head and maybe referred to disciplinary process

4. PROCEDURE TO DEAL EMERGENCY IN CASE OF AN INCIDENT:

- a. Put off the machine, barricade all around the vehicle, Switch on the Emergency Parking lights and cry for help by waving hands/red cloth.
- b. Open the door and with the help of available conscious persons, pull out the injured persons from the vehicle, place the down level ground to check their condition and render first aid.
- c. Give all possible information to owner of vehicle and WIND SITES employee who executed the contract. Give following:
 - I. Brief detail of emergency.
 - II. Persons injured.
 - III. Condition of injured.
 - IV. Help expected (requirement of ambulance)...etc.
- d. On highways seek the help from emergency contact numbers.
- e. Help ambulance person to carry the persons injured to hospital. Co-ordinate with hospital authorities to render treatment to the injured.
Lodge F.I.R with the nearest police station after taking guidance from the person who contracted the vehicle.
- f. Inform regional HR/Administration person about emergency, Hospital details, and other information felt important.

5. TERMS & CONDITIONS:

While entering into a contract, the following points shall be adhered to:

- a. Only licensed driver shall drive the vehicle.

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- b. The driver shall not be under the influence of Liquor or Gutkha/ Smoking.
- c. Vehicle shall be periodically serviced as per the recommendation of manufacture.
- d. Valid insurance for driver
- e. Valid insurance for vehicle.
- f. Valid RC book.. The decision of the management shall be final and binding
- g. Tax payment to R.T.O. regularly.

6. DOCUMENTS IN DRIVER'S POSSESSION:

At all times, the following documents shall be in the possession of the driver and/or available in the vehicle.

- a. Driver's valid license-ORIGINAL.
- b. Vehicle insurance policy
- c. R.C book
- d. Periodic servicing of vehicle record
- e. P.U.C record
- f. Vehicle owner's name, address and phone number.
- g. Each driver need to sign driver undertaking as per Annexure – 15.1

7. VEHICLE ESSENTIALS:

All vehicles shall be provided by the following items. The availability of these items shall be periodically checked by the Administrative function of the site / location.

- a. First aid box shall be provided in the vehicle as per WIND SITES norms.
- b. Portable Fire extinguisher shall be provided in the vehicles
- c. Emergency contact numbers shall be displayed on the vehicle.
- d. The driver of the vehicle shall duly fill and hand over Weekly vehicle checks.

8. DRIVER WORKING HOURS:

After every 4 hours of continuous driving, the driver shall take a rest of half hour.

9. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Driver Undertaking
ड्राइवर का वचन पत्र

1	साइट का नाम:	
2	ड्राइवर का नाम:	
3	ड्राइवर का लाइसेंस नं.	
4	गाड़ी का रजिस्ट्रेशन नं.	
5	ट्रांसपोर्टर का नाम:	

मैंने मादक पदार्थों का सेवन नहीं किया है एवं मेरे वाहन में किसी तरह का ज्वलनशील पदार्थ जैसे मिट्टी का तेल इत्यादि नहीं है। मैं कंपनी के द्वारा निर्धारित यातायात नियमों का पालन करने के लिए वचन बद्ध हूँ।

1. वाहन को निर्धारित गति सीमा में ही चलाऊंगा।
2. वाहन को अपनी साइड से ही चलाऊंगा।
3. वाहन चलते समय दिन या रात में सही दिशा-इंडिकेटर का प्रयोग करूंगा।
4. वाहन चलते समय जूते का प्रयोग करूंगा।
5. सड़क पर लगे सिग्नल एवं संकेतों का पालन करूंगा।
6. वाहन को रिवर्स करते समय दिशानिर्देशों का पालन करूंगा।
7. वाहन के नीचे या आसपास आराम नहीं करूंगा।
8. शराब बीड़ी या गुटखे का उपयोग नहीं करूंगा।
9. वाहन के अंदर खाना नहीं बनाऊंगा।
10. रात में वाहन खड़ा करने पर पार्किंग लाइट का प्रयोग करूंगा।
11. वाहन का रखरखाव अच्छी तरह से करूंगा।
12. वाहन के सभी कागजात सही सलामत रखूंगा एवं मांगे जाने पर तुरंत प्रस्तुत करूंगा।
13. अपना वाहन किसी और को चलाने नहीं दूंगा।
14. सीट बेल्ट का प्रयोग खुद भी करूंगा एवं अपने साथी पैसेंजर को भी करवाऊंगा।

उपरोक्त नियमों का पालन नहीं करने पर कंपनी मुझ पर उचित अनुशासनात्मक कार्यवाही के लिए स्वतंत्र होगी।

दिनांक :

ड्राइवर का नाम :

समय:

ड्राइवर के हस्ताक्षर :

Doc. No. RESCO/HSE/F-58A/Rev.05 Annexure 15.1 Date: 01.04.2022	Driver Undertaking ड्राइवर का वचन पत्र	RESCO GLOBAL WIND SERVICES PVT. LTD.
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1	साइट का नाम:	
2	ड्राइवर का नाम:	
3	ड्राइवर का लाइसेंस नं.	
4	गाड़ी का रजिस्ट्रेशन नं.	
5	ट्रांसपोर्टर का नाम:	

मैंने मादक पदार्थों का सेवन नहीं किया है एवं मेरे वाहन में किसी तरह का ज्वलनशील पदार्थ जैसे मिट्टी का तेल इत्यादि नहीं है। मैं कंपनी के द्वारा निर्धारित यातायात नियमों का पालन करने के लिए वचन बद्ध हूँ।

१. वाहन को निर्धारित गति सीमा में ही चलाऊंगा।
२. वाहन को अपनी साइड से ही चलाऊंगा।
३. वाहन चलते समय दिन या रात में सही दिशा-इंडिकेटर का प्रयोग करूंगा।
४. वाहन चलते समय जूते का प्रयोग करूंगा।
५. सड़क पर लगे सिग्नल एवं संकेतों का पालन करूंगा।
६. वाहन को रिवर्स करते समय दिशानिर्देशों का पालन करूंगा।
७. वाहन के नीचे या आसपास आराम नहीं करूंगा।
८. शराब पीने या गुटखे का उपयोग नहीं करूंगा।
९. वाहन के अंदर खाना नहीं बनाऊंगा।
१०. रात में वाहन खड़ा करने पर पार्किंग लाइट का प्रयोग करूंगा।
११. वाहन का रखरखाव अच्छी तरह से करूंगा।
१२. वाहन के सभी कागजात सही सलामत रखूंगा एवं मांगे जाने पर तुरंत प्रस्तुत करूंगा।
१३. अपना वाहन किसी और को चलाने नहीं दूंगा।
१४. सीट बेल्ट का प्रयोग खुद भी करूंगा एवं अपने साथी पैसेंजर को भी करवाऊंगा।

उपरोक्त नियमों का पालन नहीं करने पर कंपनी मुझ पर उचित अनुशासनात्मक कार्यवाही के लिए स्वतंत्र होगी।

दिनांक :

ड्राइवर का नाम :

समय:

ड्राइवर के हस्ताक्षर :

Sr. No.	Vehicle Reg. No.	Driver Name	VEHICLE CHECK LIST																						
			Date of Inspection	Head Light	BackLight	SideLight	Brake	ReverseHorn	Seat Belt	License	Registration	PUC	Number PlateWhite/Yellow	Spare Wheel	TyreCondition	FirstAid Box	FireExtinguisher	Emergency ContactNos.	Driver Undergone Defensive Training	Safety Display	Driver Undertaking	Driver Behavior	Neat & Tidy Condition	Driver' sSign	Inspection By
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									

INDICATE EITHER:
✓ Available & OK
✓ Available but not OK
X Not Available

Report- Prepared By:
(HR-Admin)

Report-Checked By:
(HSE-Lead)

Note-This report should come monthly basis before month end covering all vehicles.

Doc. No.: RESCO/HSE/F-59A/Rev.05 Annexure: 15.3 Date:01.04.2022			ENVIRONMENT HEALTH & SAFETY																RESCO GLOBAL WIND SERVICES PVT. LTD.							
Sr. No.	Vehicle Reg. No.	Driver Name	VEHICLE CHECK LIST																			Inspection By	Remarks			
			Date of Inspect ion	Head Light	BackLight	SideLight	Brake	ReverseHorn	Seat Belt	License	Registration	PUC	Number PlateWhite/Yellow	SpareWheel	TyreCondition	FirstAid Box	FireExtinguisher	Emergency ContactNos.	Driver Undergone Defensive Training	Safety Display	Driver Undertaking			Driver Behavior	Neat & Tidy Condition	Driver' sSign
1																										
2																										
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
INDICATE EITHER: ✓ Available & OK ✓ Available but not OK X Not Available Report- Prepared By: (HR-Admin) Report-Checked By: (HSE-Lead) Note-This report should come monthly basis before month end covering all vehicles.																										

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	RESTRICTION FOR UNAUTHORIZED ACCESS TO WIND SITE	Guideline No IGESL SITE/HSE/016
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1. OBJECTIVE:

To ensure that entry at WIND SITE is restricted and no unauthorized person has access.

2. PRE – REQUISITES FOR ACCESS TO SITES:

- a. The site shall be entered or left by use of authorized access and egress position. Entering the site or a partial area thereof is not permitted to persons without an appropriate authorization of access.
- b. All persons and vehicles entering or leaving the site are subject to search or control measures by the security.
- c. Remaining on the site beyond the working hours is permitted only for especially authorized persons WIND SITES will provide access control at site and issuance for gate passes, and will execute the project activities within those requirements and regulations.
- d. WIND SITES has the principle for its all operationally controlled work areas, that the children and person's age of below 18 years shall not be allowed at the work-sites whatever the situations arise.
- e. Entry and exit to and from the work sites shall only be via designated routes, which will be clearly sign posted. Access to the construction areas including sub – contractor employees will only be permitted to people with identification card that has been approved by WIND SITES following attendance of the Site HSE Induction Training.
- f. Visitors must be picked-up at the gate by Contractor representative or guided by the security staff from the gatehouse to the WIND SITES project office. Furthermore visitors have to be accompanied on site at all times by permanent site staffs and all visitors should be completed the Visitor Induction after enter to the site offices.
- g. All Visitors/guests/public, while getting access to wind sites their Identity will be entered into the visitor's Register & shall be given a Visitor card which the visitor has to display during the visit to the site.
- h. All Visitors/guests/public, shall also be given a Visitor pass, signed by the Authorized Official, which shall be submitted back along with Visitor card before leaving the Wind Site.
- i. All of the visitors must wear minimum required PPEs and this must be ensured before entry into the premises.

3. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

Rev.	Date	Issued By	Guideline No.	Page No.
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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ACCIDENT / INCIDENT INVESTIGATION & REPORTING	Guideline No IGESL SITE/HSE/017
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1. SCOPE:

All Wind sites shall keep records of all work accident including investigation. This applies to all incidents on the facility with regard to IGESL & RESCO employees (Engineers, operators and office personnel) and third parties (contractors, inspectors, visitors etc.).

2. OBJECTIVE:

The purpose of these guidelines is to provide general steps is to be taken in case of personal injury & procedure to report personal injury & accident.

3. REPORTING:

a. Internal Reporting:

- I. All near misses, Incidents & accidents shall be reported through prescribed format. It is the responsibility of all IGESL & RESCO employees and contractors on the facility to ensure that all near misses, Incidents & accidents are reported to their supervisors. The supervisors must ensure that those then are reported to the Safety officer and / or the Project Manager / Site in-charge. This applies to all IGESL /RESCO Project sites world-wide.
- II. Copies of all the reports shall be sent to corporate office-GCHR & Head (Project & O&M).

b. External Reporting:

- I. Notification of accidents or dangerous occurrences to external authority is legally to be done by the factory manager designate of the facility to the authorities under the local regulations within stipulated time limits. If the facility where project work is under progress falls under jurisdiction of client or other agency, reporting to the authority shall be undertaken by them itself. In such cases, accident forms of such agency should also be filled.
- II. If the facility being worked is under license to IGESL/RESCO, the factory manager designated shall be responsible for external communication according to local regulation i.e. Factories Rules of that state
- III. Safety Officer is responsible for the regular communication to third parties like local authorities, fire brigades, medical centre, hospitals, mutual aid organization contractors, client / customer EHS Dept. etc.

c. Accident / Incident Investigation:

All accidents including first aid report shall be initially investigated by Safety officer and Project Manager / Site in charge upon the seriousness and local requirements a decision for a full fledged investigation shall be forwarded to corporate office. The purpose of Accident Investigation & Reporting is:

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ACCIDENT / INCIDENT INVESTIGATION & REPORTING	Guideline No IGESL SITE/HSE/017
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- I. To meet the relevant statutory Employers requirements for injury and accident reporting.
- II. To identify the immediate basic causes of Accident / Incident.
- III. To prevent recurrence of similar accident / incident by applying suitable control measures.
- IV. To find facts i.e. exact causes of Accident / Incident.
- V. To make hazard known to management, co-workers and supervisors to direct their attention to Accident prevention.
- VI. To find out injury rates to comply Safety performance.
- VII. To use the record for the purpose of Job Safety Analysis / Job Hazard Analysis.
- VIII. To develop safety rules, procedures, bulletins, posters, material for safety meeting and motivating the employees.

d. Corrective Actions and Follow-up:

- I. All accidents and incidents shall be discussed in the routine EHS Meetings. Lessons to be learned and progress with follow-up corrective actions should be covered during the discussion.
- II. The Safety Coordinator should report in the Safety Committee Meetings all major and high potential loss accidents and incidents that have occurred since the previous meeting. Progress of the follow-up actions should also be discussed. Supervisors should discuss accidents and incidents occurring within their areas and those relevant from other areas at the day-to-day briefing meetings.
- III. The EHS Coordinator should prepare in co-operation with the Project Manager / Site in-charge, a monthly follow-up/progress report on outstanding recommendations.

e. Reporting injuries/near misses:

I. All injuries:

In the event of work related emergencies or injuries, however small, notify your supervisor/advisor and the Human Resources Department as soon as possible.

II. Near Misses:

All "near miss" accidents not causing injury must be reported to supervision, in order to investigate the cause and eliminate potential hazards. A Near Miss is an incident which could have resulted in a fatality or serious injury.

III. Consequences of Failure To Report:

Failing to report an injury results in a loss to investigate the cause, thus, the chance to eliminate a recurrence is lost. Other consequences may include: the possibility for infection of even a small wound and delay or loss of injury benefit to which the employee may be entitled.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	ACCIDENT / INCIDENT INVESTIGATION & REPORTING	Guideline No IGESL SITE/HSE/017
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IV. Proper Attention to Injury:

Injury treatment must be carried out by the qualified medical staff. Incorporating with human resources department the concerned supervisor/advisor will make the necessary arrangements for injury treatment.

4. POWER TO AMEND:

- a. Any change of the manual shall be approved by the Head – GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Doc. No. IGESL/HSE/F-60/Rev.05 Annexure:17.1 Date: 01.04.2022		NEAR MISS / INCIDENT REPORT			
S. No.	Parameter	Information / Description			
1	Site Name				
2	Date, Shift & Time of Incident				
3	Type of Incident/NM/Bird accident/ Road accident etc.				
4	Name of the injured person: (Incident/Near Miss Person)				
5	Designation: (permanent / temporary / contract / supplier / visitor)				
6	Name of the Shift In-charge				
7	Section of department and exact place where the incident took place				
8	Did the person wear suitable PPE during the incident				
9	If the injured is caused by Machinery/Name of the machinery/Part of the machinery/Any other specify				
10	State exactly what the person was doing at that time				
11	Describe briefly how the incident occurred (use additional sheet if required)				
12	i) Nature and extent of injury (Fracture, Scaled/Bury/Scratch etc.) or Near Miss				
	ii) Location of Injury (Leg/Hand/Head/Fingers/Body/Eye/Nose/Ear etc)				
	iii) Location of Near Miss				
13	What may be the possible root cause for the incident & action taken (use additional sheet if required)	1. 2. 3.			
14	What are the steps to be taken to avoid the same in future and Potential Non-Conformities				
15	Name of the witness	1)			
		2)			

This report has to be submitted to the Safety Department within 24 Hours of the incident occurred.

Signature of Shift In-charge

Signature of Department Head

*Attach supporting snap below the sheet on next page.

Doc. No. RESCO/HSE/F-60A/Rev.05 Annexure:17.1 Date: 01.04.2022		NEAR MISS / INCIDENT REPORT		RESCO GLOBAL WIND SERVICES PVT. LTD.	
S. No.	Parameter	Information / Description			
1	Site Name				
2	Date, Shift & Time of Incident				
3	Type of Incident/NM/Bird accident/ Road accident etc.				
4	Name of the injured person: (Incident/Near Miss Person)				
5	Designation: (permanent / temporary / contract / supplier / visitor)				
6	Name of the Shift In-charge				
7	Section of department and exact place where the incident took place				
8	Did the person wear suitable PPE during the incident				
9	If the injured is caused by Machinery/Name of the machinery/Part of the machinery/Any other specify				
10	State exactly what the person was doing at that time				
11	Describe briefly how the incident occurred (use additional sheet if required)				
12	i)Nature and extent of injury (Fracture, Scaled/Bury/Scratch etc.) or Near Miss				
	ii)Location of Injury (Leg/Hand/Head/Fingers/Body/Eye/Nose/Ear etc)				
	iii)Location of Near Miss				
13	What may be the possible root cause for the incident & action taken (use additional sheet if required)	1. 2. 3.			
14	What are the steps to be taken to avoid the same in future and Potential Non-Conformities				
15	Name of the witness	1)			
		2)			

This report has to be submitted to the Safety Department within 24 Hours of the incident occurred.

Signature of Shift In-charge

Signature of Department Head

*Attach supporting snap below the sheet on next page.

Doc. No. IGESL/HSE/F-61/Rev.05 Annexure: 17.2 Date: 01.04.2022		PRELIMINARY ACCIDENT REPORT			
Date		Unit / Site		Location	
Sl. No	Description		Status		
1	Name; Age, Sex,& Designation of the injured				
2	Time of the accident				
3	Location of the accident				
4	Brief Description of the accident:				
5	Nature of Injury				
6	Unsafe Acts/Conditions which caused				
7	Safety appliances (Relevant) used				
8	Remedial measures taken to prevent reoccurrence				
9	Witness		1. 2.		

HSE Officer: _____

Doc. No. RESCO/HSE/F-61A/Rev.05 Annexure: 17.2 Date: 01.04.2022		PRELIMINARY ACCIDENT REPORT		RESCO GLOBAL WIND SERVICES PVT. LTD.	
Date		Unit / Site		Location	
Sl. No	Description		Status		
1	Name; Age, Sex,& Designation of the injured				
2	Time of the accident				
3	Location of the accident				
4	Brief Description of the accident:				
5	Nature of Injury				
6	Unsafe Acts/Conditions which caused				
7	Safety appliances (Relevant) used				
8	Remedial measures taken to prevent reoccurrence				
9	Witness		1. 2.		

HSE Officer: _____

Doc. No. IGESL/HSE/F-62/Rev. 05 Annexure: 17.3 Date: 01.04.2022	ACCIDENT INVESTIGATION AND ROOT CAUSE ANALYSIS	
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STEP 1 - BACKGROUND UNDERSTANDING AND DATA COLLECTION
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Date		Time		Location	
BRIEF ABOUT THE OCCURANCE (Who was involved, what machinery was involved, what was the work being done, what exactly happened, what was extent of injury/damage					
Exact Sequence of events					
Evidence collection and witness testimony					
Photographs taken				Yes	No
Witness testimony taken				Yes	No
Supervisor's Testimony taken				Yes	No
Name of Supervisor					
Name of witness 1					
Name of witness 2					
Extent and nature of Damage/Injury					

STEP 2 –IDENTIFICATION OF DIRECT AND CONTRIBUTING CAUSE

Use the following listing as an aid for identifying the factors that led to the accident. Don't be limited by the categories listed—add items as needed. Check all that apply.

POLICIES/PROGRAMS			COMMUNICATION		
1	Not Developed or Inadequate		1	Insufficient Planning For Tasks	
2	Developed and Communicated		2	Lack of Worker Communication	
3	Developed—Not Communicated		3	Lack of Supervisor Instruction	
4	Developed-Not Followed/Enforced		4	Sufficient Supervisor Instruction	
5	Developed—Not Understood		5	Confusion After Communication	
6	Lack of Disciplinary Policy		6	Lack of Understanding of Task	
7	Disciplinary Policy Not Enforced		7	Work Team Breakdown	
HAZARDS IDENTIFICATION			WORK BEHAVIOR		
1	Unidentified or Not Labeled		1	Shortcuts Taken	
2	Known But Not Corrected		2	Deviations-Common, Allowed etc...	
3	Known But Not Reported		3	Special Infrequent Task	
4	Created by External Factors		4	Tool/Equipment Used Improperly	
5	Known But Not Reported		5	History of Accidents/Incidents	
6	Condition Changed Not Conveyed		6	Disregard/Refused to Follow Procedure	
7	Equipment Repaired Deficiently		7	Staff Assistance Required	
8	PPE Not Adequate or Defective		8	Horseplay	
PRODUCTIVITY FACTORS			ENVIRONMENT		
1	Heavy Workload		9	Repetitive or Physically Demanding	
2	Tight Schedule To Complete Task		10	Going On/Coming Off Vacation	
3	Long/Unusual Working Hours		1	Extreme Weather/Temperature Factors	
4	Falsely Perceived Need to Hurry		2	Poor Housekeeping	
5	Staff Assistance Unavailable		3	Poor Lighting	
6	Staff Assistance Inadequate		4	Poor Visibility	
7	Changes in Process		5	Inadequate Air Quality	
8	Was Employee Ill?		6	Excessive Noise	
9	Medication, Drugs, Alcohol Factors		7	Visibility of Labels/Warning Signs	
10	Double Shift		8	Lack Visible and Audible Alarms	
Personal Protective Equip (PPE)			FACILITIES/EQUIPMENT		
1	Not Available		1	Poor Facility Design	
2	Requirement not identifies		2	Poor/Faulty Equipment or Design	
3	Required PPE Not Used/Worn		3	Poor Workstation Design	
4	Not Trained On How To Use		4	Equipment Not Guarded	
5	Inadequate Fit		5	Equipment Repair Deficient	
6	PPE Not Used Adequately		6	Lack of Preventative Maintenance	
7	Poor Condition		7	Employee Lack of Knowledge	
8	Inadequate for Job Performed		8	Equipment Failure	
9	Lack of Supervisor Enforcement			Inadequate Inspection Timelines	

From the categories identified above, tick the major cause or causes of the accident

POLICIES/PROGRAMMES		COMMUNICATION	
HAZARD IDENTIFICATION		WORK BEHAVIOUR	
PRODUCTIVITY FACTORS		ENVIRONMENT	
PERSONAL PROTECTIVE EQUIPMENT		FACILITIES/EQUIPMENT	

Overall comments of the investigation and reason of identify major and contributory cause

STEP 3 –ROOT CAUSE ANALYSIS AND ACTION PLAN FOR EACH CASUAL FACTOR

Why Did This Happen?

WHY...?

WHY...?

WHY...?

WHY...?

Actions

**Completion
Date**

Person Responsible

**Actions
Completed**

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

☐ Yes ☐ No

Site Safety Officer

Head of Department

Site Head

Note: Snap of accident should paste on next page.

Doc. No. RESCO/HSE/F-62A/Rev. 05 Annexure: 17.3 Date: 01.04.2022	ACCIDENT INVESTIGATION AND ROOT CAUSE ANALYSIS	RESCO GLOBAL WIND SERVICES PVT. LTD.
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STEP 1 - BACKGROUND UNDERSTANDING AND DATA COLLECTION

Date		Time		Location	
BRIEF ABOUT THE OCCURANCE (Who was involved, what machinery was involved, what was the work being done, what exactly happened, what was extent of injury/damage					
Exact Sequence of events					
Evidence collection and witness testimony					
Photographs taken				Yes	No
Witness testimony taken				Yes	No
Supervisor's Testimony taken				Yes	No
Name of Supervisor					
Name of witness 1					
Name of witness 2					
Extent and nature of Damage/Injury					

STEP 2 –IDENTIFICATION OF DIRECT AND CONTRIBUTING CAUSE

Use the following listing as an aid for identifying the factors that led to the accident. Don't be limited by the categories listed—add items as needed. Check all that apply.

POLICIES/PROGRAMS			COMMUNICATION		
1	Not Developed or Inadequate		1	Insufficient Planning For Tasks	
2	Developed and Communicated		2	Lack of Worker Communication	
3	Developed—Not Communicated		3	Lack of Supervisor Instruction	
4	Developed-Not Followed/Enforced		4	Sufficient Supervisor Instruction	
5	Developed—Not Understood		5	Confusion After Communication	
6	Lack of Disciplinary Policy		6	Lack of Understanding of Task	
7	Disciplinary Policy Not Enforced		7	Work Team Breakdown	
HAZARDS IDENTIFICATION			WORK BEHAVIOR		
1	Unidentified or Not Labeled		1	Shortcuts Taken	
2	Known But Not Corrected		2	Deviations-Common, Allowed etc...	
3	Known But Not Reported		3	Special Infrequent Task	
4	Created by External Factors		4	Tool/Equipment Used Improperly	
5	Known But Not Reported		5	History of Accidents/Incidents	
6	Condition Changed Not Conveyed		6	Disregard/Refused to Follow Procedure	
7	Equipment Repaired Deficiently		7	Staff Assistance Required	
8	PPE Not Adequate or Defective		8	Horseplay	
PRODUCTIVITY FACTORS			ENVIRONMENT		
1	Heavy Workload		9	Repetitive or Physically Demanding	
2	Tight Schedule To Complete Task		10	Going On/Coming Off Vacation	
3	Long/Unusual Working Hours		1	Extreme Weather/Temperature Factors	
4	Falsely Perceived Need to Hurry		2	Poor Housekeeping	
5	Staff Assistance Unavailable		3	Poor Lighting	
6	Staff Assistance Inadequate		4	Poor Visibility	
7	Changes in Process		5	Inadequate Air Quality	
8	Was Employee Ill?		6	Excessive Noise	
9	Medication, Drugs, Alcohol Factors		7	Visibility of Labels/Warning Signs	
10	Double Shift		8	Lack Visible and Audible Alarms	
Personal Protective Equip (PPE)			FACILITIES/EQUIPMENT		
1	Not Available		1	Poor Facility Design	
2	Requirement not identifies		2	Poor/Faulty Equipment or Design	
3	Required PPE Not Used/Worn		3	Poor Workstation Design	
4	Not Trained On How To Use		4	Equipment Not Guarded	
5	Inadequate Fit		5	Equipment Repair Deficient	
6	PPE Not Used Adequately		6	Lack of Preventative Maintenance	
7	Poor Condition		7	Employee Lack of Knowledge	
8	Inadequate for Job Performed		8	Equipment Failure	
9	Lack of Supervisor Enforcement			Inadequate Inspection Timelines	

From the categories identified above, tick the major cause or causes of the accident

POLICIES/PROGRAMMES	COMMUNICATION
HAZARD IDENTIFICATION	WORK BEHAVIOUR
PRODUCTIVITY FACTORS	ENVIRONMENT
PERSONAL PROTECTIVE EQUIPMENT	FACILITIES/EQUIPMENT
Overall comments of the investigation and reason of identify major and contributory cause	

STEP 3 –ROOT CAUSE ANALYSIS AND ACTION PLAN FOR EACH CASUAL FACTOR

Why Did This Happen?

WHY...?

WHY...?

WHY...?

WHY...?

Actions	Completion Date	Person Responsible	Actions Completed
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

Site Safety Officer	Head of Department	Site Head

Note: Snap of accident should paste on next page.

Doc. No. IGESL/HSE/F-60 B/Rev.05 Annexure: 17.4 Date: 01.04.2022	Unsafe Act (UA) and Unsafe Condition(UC) data Collection and Corrective and Preventive Actions	
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Sr. No.	Data From report										Corrective actions					
	Site	Section	UA/UC	Date of Observation	Location/ Area	Description of What Happened	Possible out come/Hazard	Control Measure	Observer's Name	Photo Before	Priority	Remedial Action	Target Date	Responsibility	Status	After corrective Action Photo
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
Prepared By:							Department Lead:					Site in Charge				
Sign -							Sign:					Sign:				

Doc. No. RESCO/HSE/F-60 A/Rev.05 Annexure: 17.4 Date: 01.04.2022		Unsafe Act (UA) and Unsafe Condition(UC) data Collection and Corrective and Preventive Actions										RESCO GLOBAL WIND SERVICES PVT. LTD.				
Sr. No.	Data From report										Corrective actions					
	Site	Section	UA/UC	Date of Observation	Location/ Area	Description of What Happened	Possible outcome/Hazard	Control Measure	Observer's Name	Photo Before	Priority	Remedial Action	Target Date	Responsibility	Status	After corrective Action Photo
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
Prepared By:							Department Lead:					Site in Charge				
Sign -							Sign:					Sign:				

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	CONSERVATION OF TOP SOIL, AIR AND FLORA & FAUNA	Guideline No IGESL SITE/HSE/018
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1. BACKGROUND:

Native vegetation provides habitat for native animals, reptiles and insects including shelter, food, protection from predators and breeding areas. The Environmental Management Implementation Plan (EMIP) will identify any special requirements for protecting native fauna at Project sites.

2. OBJECT:

Construction sites may encroach on native animal habitat and it is important to make sure that no native animals are harmed or killed during construction operations. If animals, including lizards and snakes, are found on site and are likely to be damaged by earthmoving equipment, they should be relocated to an area away from the project. Ensure that no runoff of materials, fuels or other substances is allowed to enter storm water drains, watercourses and the marine environment to avoid damage to aquatic and marine animals and fish.

a. BEFORE WORKING

- i. Identify areas which are likely to be potential animal habitat.
- ii. Check the EMIP or with your supervisor for any particular measures to protect fauna on your site.

b. DURING THE WORK

- i. Check for fauna before clearing vegetation. Keep out of areas of native vegetation.
- ii. Check trenches and excavations for trapped animals. If native animals are found on the site, contact National Parks and Wildlife Department of India for removal. Report any injury caused to a native animal.
- iii. Salvage hollow limbs from cleared vegetation and place in remaining trees and vegetation, where possible. Clear up any waste food or food containers. Do not disturb vegetation outside the construction zone.
- iv. Do not disturb nests, breeding sites or young.
- v. Do not attempt to kill or capture snakes unless directly threatening your safety.
- vi. Do not bring dogs or other pets to the worksite
- vii. Monitoring avian fauna should be done once on a half yearly basis by ornithologist & reports should be presented to the management.

3. TOP SOIL PREVENTION & RE-USE:

a. OBJECTIVE

Topsoil is important for plant growth and, in areas of native vegetation, may be a significant seed source. Retaining and reusing topsoil will assist in landscaping the project

When stripping topsoil maintain the soil layers in separate stockpiles and replace them in the same order as they were removed (the top 15 cm contains plant seeds, bulbs and soil micro organisms).

Wherever possible, return topsoil and mulched vegetation to approximately the same area from which it was removed.

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b. SELECTION CRITERIA

This technique is applicable to all types of areas (Pathways, Temporary site office & Storage yard), where earth-disturbing activities expose subsoil layers that are poorly suited to supporting vegetation growth. Topsoil is generally not placed on areas that are steeper than 3:1 or which are not adequately graded and compacted.

c. DESIGN CONSIDERATIONS

Preservation and reuse of native topsoil helps to improve the success rate of new vegetation. Additional organic soil or compost may be used for some areas which do not have fertile soil layers.

Typically, a minimum of 4 inches of stabilized topsoil is needed to support grass vegetation. Trees, shrubs and vines will require a good layer of topsoil in addition to the proper subsurface soils. If the site is excavated down to rock such as sandstone or shale, then 6 to 12 inches of topsoil or additional soil is recommended for good plant growth.

d. STRIPPING TOPSOIL

Vegetative material that is cleared and grubbed during construction can be economically reused as compost or mulch onsite if handled correctly. Inspect to be sure that nuisance vegetation and weeds are not composted. Stockpile and water as necessary. Prior to stripping away topsoil, make certain that all down slope sediment control practices are in place and operational. Strip topsoil (typically 4 to 6 inches) only from those areas that will be disturbed by excavation, filling, road building, or compaction from equipment.

Locate topsoil stockpiles where they will not erode, block drainage structures, or interfere with work on the site. Contain potential stockpile sediment runoff using measures such as silt fences, temporary seeding, etc. If stockpiles remain more than 14 days, local, state and federal requirements, require temporary stabilization.

i. PLACING TOPSOIL

- i. Prior to placing topsoil, verify that the sub grade has been graded and compacted.
- ii. Scarify sub grade to a depth of 3 inches or disk the sub grade to ensure that topsoil bonds with underlying earth.
- iii. Imported topsoil, if needed, shall be from a reliable non-contaminated source.
- iv. Perform pH tests prior to placement in order to determine soil amendments and treatments necessary to support vegetation growth.
- v. Perform pH tests whenever a change in topsoil is noted or a different source is selected.
- vi. Apply a minimum of 4 inches topsoil evenly. Compact soil with one or two passes of a tracked piece of equipment up and down the slope.
- vii. Apply fertilizer at rates suitable for the particular type of vegetation and soil conditions.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	CONSERVATION OF TOP SOIL, AIR AND FLORA & FAUNA	Guideline No IGESL SITE/HSE/018
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4. CAVATED SOIL RE-USES:

a. OBJECTIVES

During construction of Wind Farm projects (Civil Foundations of Wind Turbines, Switch yards and Grid sub Stations), road works, installation of utility cables and similar operations, volumes of soil are excavated or stripped from the surface.

Sometimes this excavated soil is re-used as filling material on the excavation site. In most cases, however, the excavated soil will be carried off for re-use on other locations. Soil can be re-used for instance for raising the profile of a terrain or filling of pits. Soil can be incorporated in the body of a dyke or in the sub-foundation of roadways.

Where the excavated soil is managed or reused in an improper manner, there is a danger of uncontaminated soils being polluted, or of soils that are only slightly contaminated being more heavily polluted.

b. PURPOSE

The purpose of the present guidelines is to avoid secondary pollution of the soil, groundwater and surface waters as a result of the deployment and reuse of contaminated soils. It addresses not only the protection of the soil itself, but also safeguards humans who use it, and animals and plants which thrive on it. It also safeguards ground and surface waters from the dangers that can arise from the handling of excavated soils. It contains criteria enabling a decision to be made as to whether excavated soil may be reused by using it directly on a specific site, or (if necessary following pre-treatment) dumped as waste.

c. SCOPE AND DEFINITIONS

The present guideline concerns the:

- i. A and B horizons of the soil (black area in Figure-1).
- ii. For Soil in the sense defined in the LPE, i.e. the topmost 'unsealed' layer of the earth in which plants can grow (For that Refer: Guidelines for Top Soil Prevention & Reuse).
- iii. For handling the Excavated Soil from the substratum shown in C horizon,

Excavated soils and material from the substratum must be handled separately, making it necessary to determine the boundary between the two (cf. Fig. 1). The demarcation between the horizons may either be sharp, as in the case of stratification, or blurred. Normally, the topsoil (A horizon) has a thickness of 5-30 cm and the subsoil (B horizon) 150 cm. These thicknesses vary from one site to another. Depending on the type and constitution of the soil (SBC) at a particular site.

The guideline concerns only the requirements on the pollutant content of excavated soils, and not physical aspects such as excavation, temporary storage or use of the excavated soil in remodelling the terrain.

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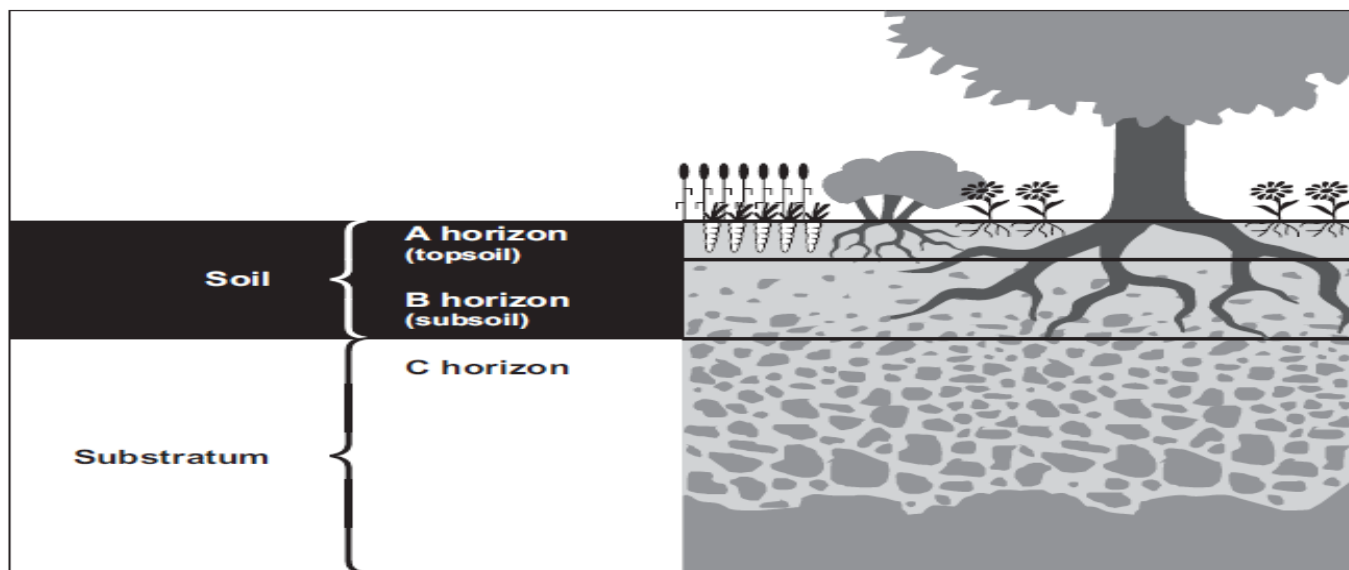


Figure 1: This guideline concerns the *black area*.

In our case, the maximum depth of Excavation for Wind Turbines is 3 Mtr. which is covered in A and B Horizon.

5. ENVIRONMENTAL MONITORING PROGRAMME:

Environmental monitoring and supervision programme is a vital process of any management plan of the development project. This helps in alarming the potential problems that may result from the proposed project. This will help in taking prompt action for implementation of effective corrective measures. The main objectives of the monitoring program are:

- To assess the changes in environmental conditions.
- To monitor the effective implementation of mitigation measures.
- Changes in environmental quality for further preventive action.

An environmental monitoring programme with parameters and frequency location are given in **Table: 1&2**. In order to ensure the effective implementation of the monitoring programme, regular inspection shall be taken up by the Environmental and Safety team. Compliance/ non compliance of the monitoring programme shall be recorded and quarterly report shall be submitted to the Management. The test as given shall be undertaken by the site SHE Manager/Officer as per the table 1&2.

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Table 1
Environmental Monitoring Programme – Construction Phase

Item	Location of Sampling	Parameters	Frequency	Standard Methods
Air quality at nearest village from wind turbine.	1. At Storage Yard 2. Nearest Village 3. Nearest Informal Settler	SO ₂ (24 hrly)	Twice in year during construction Period.	1.Improved West and Gaeke method. 2.Ultraviolet Fluorescence
		NO _x (24 hrly)		1.Jacob & Hochheiser modified Method. 2.Gas Phase Chemilumin essence
		SPM(24 hrly)		High Volume Sampling (HVS)
		PM 10 μ and 2.5 μ (24 hrly)		Respirable Particulate Matter Sampler
Noise measurement at nearest village or.	1.All the Informal settler 2.Nearest Villages or Nearest settlement from wind turbine	Equivalent noise level (Leq) for day time and night time (Ld and Ln).	Once in a three month during construction period.	Hourly
Water quality at the nearest WTG location (if any)	Bore well locations Nearest Village	Ground water samples	Twice in year during construction Period.	IS: 10500
Soil	at substation and storage yard	Texture, physico chemical analysis and relevant heavy metals	Twice in year during Construction period.	As per applicable standard

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Table 2
Environmental Monitoring Programme - Operation Phase

Environmental Monitoring Programme - Operation Phase			
Item	Parameters	Frequency	Standard Methods
Noise	Equivalent noise level (Leq) for day time and night time (Ld and Ln).	Once in year at nearest village from wind turbine.	Hourly
Surface Water Quality	Measurement of surface, ground water and soil quality for lubricating oil if any contamination occurs as a result of considerable oil spill to a nearby surface or unpaved ground due to the maintenance and operation of wind turbine activities	Once in year at the nearest Surface water/ ground water from the wind turbine	IS: 10500
Ground Water Quality			IS:2296
Soil			As per applicable standard
Bird mortality	annual monitoring of windmills be carried out at least for two years for two migratory bird seasons (November-March) in order to understand if there are any significant mortality of birds or disturbance to them due installation of windmills in the project area.		-

6. POWER TO AMEND:

- a. Any change of the guideline shall be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding

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TURBINE SEARCH SUMMARY

Project/Site Name:
(Complete each day of search)

Month:

*Weather: F= fog, D= drizzle, R= steady rain, W=wind over 10mph

Date	WTG/Feeder Number/Location	Observer	Start Time	End Time	Weather	Bat Carcass	Bird Carcass	Other Animal Carcass	Total	Comments (If any)/ Reporting person name

Note: Any bird/animal accident of feather found nearby plant/lines must report to site HSE person for record and analysis purpose.

Signature of Environment Health & Safety Officer

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TURBINE SEARCH SUMMARY

Project/Site Name:
(Complete each day of search)

Month:

*Weather: F= fog, D= drizzle, R= steady rain, W=wind over 10mph

Date	WTG/Feeder Number/Loc ation	Observer	Start Time	End Time	Weather	Bat Carcass	Bird Carcass	Other Animal Carcass	Total	Comments (If any)/ Reporting person name

Note: Any bird/animal accident of feather found nearby plant/lines must report to site HSE person for record and analysis purpose.

Signature of Environment Health & Safety Officer

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	DRINKING WATER AND SANITATION	Guideline No IGESL SITE/HSE/019
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1. OBJECTIVE:

To ensure that employees at work location are provided with potable and sufficient Drinking water and adequate sanitation facilities.

2. SCOPE:

This guideline shall be applicable across all sites of IGESL & RESCO

3. BUDGETARY ALLOCATION and RESPONSIBILITY

It shall be the responsibility of the Infrastructure Head to include the cost of drinking water & sanitation in site budget while formulating it. After the project stage when the site is operational it shall be the responsibility of O & M Head to include the same in O & M budget. It shall be responsibility of the Site Administration to ensure availability of all such facilities at the site as per the budget available.

4. DRINKING WATER & SANITATION FACILITIES TO BE PROVIDED AT SITE:

Following facilities to be provided at site is mentioned below:

a. Drinking Water

Adequate cold drinking water must be provided or made available at readily accessible and suitable places. All water supply or storage shall be at a distance of not less than 50 feet from any latrine drain or other source of Pollution. Regular testing and analysis of water shall be done through Government authorized lab to ensure its quality.

To ensure quality of drinking water NABL accredited lab testing at least once in six months and utility water testing at least once in a year required.

b. Washing Facilities

- i. Clean running water should be provided for washing facility.
- ii. Soap or other suitable means of cleaning should be available.
- iii. Towel or suitable means of drying should be there.

c. Changing Room & Locker

Changing room shall be needed where worker have to wear special clothing for the purpose of their work. The room shall be well lighted and having seating & cloth keeping facilities.

d. Pre – Monsoon Activities

- i. Cleanliness of all drains and ensures all drains are covered near the work locations.
- ii. All the manholes shall be covered.
- iii. Proper storage of oils / chemicals.

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e. Latrines & urinals

Latrines shall be provided in every work place on the following scale namely:-

- i. There shall be at least one latrine for every 25 employees.
- ii. Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
- iii. Construction of latrines: The inside walls shall be constructed of masonry or some suitable heat-resisting nonabsorbent materials and shall be cement washed inside and outside at least once a year. Latrines shall not be of a standard lower than borehole system.
- iv. There shall be at least one urinal for male workers up to 50 and one for female workers up to fifty employed at a time, provided that where the number of male or female workmen, as the case may be exceeds 500, it shall be sufficient if there is one urinal for every 50 males or females up to the first 500 and one for every 100 or part thereafter.
- v. The latrines and urinals shall be adequately fit and shall be maintained in a clean and sanitary condition at all times.
- vi. Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the Statutory Authorities.
- vii. Water shall be provided by means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.

Where there is no provision of latrine & urinals in some locations portable/mobile latrine & urinals should provide for the same.

5. POWER TO AMEND:

- a. Any change of the guideline shall have to be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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1. OBJECTIVE:

The Company is committed to managing activities to reduce the resources we use and, where possible, to re-use, recycle or recover resources. The Guideline provides a general procedure for Waste Management at wind sites.

2. PURPOSE & SCOPE:

Purpose of this procedure is to establish & maintain documented procedure to monitor & measure the key characteristics of the operations & activities that can have a significant impact on the environment.

This procedure is applicable to all processes & services performed inside the all IGESL's & RESCO sites, which can have adverse impact on environment & put affect the regulatory compliance.

Sr. No	Facility	Details	Responsibility	Remarks
1	Waste Storage facility	Hazard waste storage facility shall construct as per requirement at site. The Hazardous waste storage Container: - The container shall be of a material compatible to the waste i.e. It should not react to the waste stored resulting in to corrosion or damage of the container. The container shall be suitable for transportation with tight lid and labeled. Only identical hazardous waste shall be stored in a container and waste shall not be mixed with other hazardous waste or domestic waste in order to minimize the waste quantity. The color of container shall be preferred red. Secondary Container: - The hazardous waste container shall be placed in a secondary container; the capacity of the container shall be minimum 110% of the capacity of largest waste container stored/placed in it. The secondary container shall be impervious and shall not any spill to percolate it and contaminate land or water body. Shed: - The hazardous waste shall be provided with a suitable and permanent shed to protect it from rain which can result in to flooding and spill of waste contaminating water body and land contamination. The shed will protect the waste from direct sunlight /heat resulting in to vaporization resulting in to air pollution and fire hazards. Location of hazardous waste store: - The store shall be located in an area which is isolated and is not normally accessed by workforce in order to eliminate exposure risk. The waste storage area shall be free from live electricity and vegetation to eliminate fire risk. The store shall be well ventilated and easily and controlled accessibility in order to load it while transporting it to approved vendor. Fire Extinguishers: - Suitable and sufficient fire extinguishers (ABC type recommended) shall be placed at the Hazardous waste store for firefighting. Spill Kit: - A spill management kit, having saw dust, brush a collection bin and arrangements shall be placed near hazardous waste store room. However modern spill kits can	O&M and infra In charge/ Store In charge	Budget shall Required from Management

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		also be provided. Display Board:- A display board as per fig 2 , shall be displayed which provides information over nature of hazardous waste, Quantity stored , associated risk signage, No Smoking signage and mandatory PPE requirement. MSDS for all relevant waste shall be made easily available.		
2	Waste collection	1. Hazard Waste shall be collect from site in gunny bags/Container & deposit to Hazard waste storage area & informed to Store in charge by Hazard waste generator. 2.All inventory of Hazard Waste shall be maintained in prescribed format	Job executer/Site In Engineer. Store In charge	
3	Disposal of Hazard Waste	Disposal of waste will be done by authorised vendor (from concern State pollution control board) only. 1. We have to obtain membership SPCB (state pollution control board) as a Hazard waste generator (Membership charges & procedure is applicable). 2. Hiring of HW disposal vendor: After that we have to take membership from Hazard waste disposal vendor (registered by concern SPCB) Charges procedure applicable. 3. Coordinate with vendor regarding hazard waste disposal in proper manner & obtain required receiving on prescribed format by SPCB from the vendor.	Site EHS in charge/Corporate HR/Liaison Site EHS in charge/Corporate HR/ Liaison Site Store In charge	Budget shall Required from Management as per applicable charges (as per SPCB norms & vendor charges)

3 LIST OF HAZARDOUS WASTE:

Sr. No.	Type of Waste	Quantity (Kg /Ltr.)
1	Waste Oil	
2	Empty Cement Bags/Tarpaulin	
3	Oil soaked Cotton Waste	
4	Battery	
5	Paint /Chemical/Empty container	
6	Tube lights	
7	Electrical Waste	
8	Plastic & Rubber	
9	Others	

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- 4. Waste Generator Responsibilities:-** Individual, supervisors, workers, contractors etc. are Considered the actual originators of these waste materials. Therefore, it is the responsibility of each generator to identify any and all hazardous wastes that he or she might be producing, and to assure the waste is handled in a manner consistent with the E.H.S requirements listed in this document.

Where E.H.S requirements identify hazardous waste must be collected separately, the waste generator must make every effort to segregate those waste from their regular waste and stored in the marked container.

5. Site EHS representatives' responsibilities:-

Developing a written hazardous waste disposal procedure. Developing and maintaining a monitoring plan for all hazardous waste. Providing both in-house and online waste management training to all required campus personnel. Training will be tailored to meet legal requirements. The level of training required for trainees is a direct function of the work related to waste management. Providing periodic inspections of sites areas. Acting as point of contact with all regulatory Agencies related to waste management issues. Initiating policies and programs to minimize the generation of hazardous wastes. Keeping up-to-date with current regulations and best practices.

6. GENERATION, STORAGE AND DISPOSAL OF WASTE MATERIALS:

- As with any large scale construction project, the generation of waste from wind farm development is inevitable. However, the types and quantities of waste produced will be dependent on the local conditions and scale and type of development.
- All possible actions will be taken by the Contractor to avoid or minimise the volume of waste generated.
- Waste materials will not be stored within 50metres of a watercourse wherever possible. Where this may not be practically achievable, the Contractor will provide detailed justification for a reduction in this specified buffer distance, however, irrespective of the justification provided, on no account will this buffer distance be reduced to less than 20metres.
- Where hazardous waste is involved separate containers must be provided appropriate to the material being stored, used, transported or disposed of. Emergency procedures must also be clearly documented.
- Material storage areas will be clearly located and signed. Space permitting, key waste streams should be segregated. The segregation scheme should include appropriate training, monitoring and enforcement with clear signage and using the National Colour Coding Scheme
- Where possible, the Contractor will arrange for just in time delivery and double handling will be avoided. Delivery vehicles should aim to remove waste materials on return trip.
- All waste will be transported from site at an appropriate frequency by a registered waste carrier to prevent overfilling of waste containment facilities and will be reused/recycled where practical.
- Handling & storage of the waste in the factory premises shall be carried out as mentioned in the table.

SL. NO	WASTE DESCRIPTION	STORAGE	HANDLING
1	Bio-degradable	Designated area	Manual
2	Non bio degradable- Plastic	Designated area	Manual
3	Non bio degradable- Metallic	Designated area	Manual

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4	E-Waste & Discarded Lamps	Designated area	Manual
5	Liquid waste	Designated area	Manual
6	Lead Acid Batteries	Designated area (Returned to Dealer/ authorised by pollution control board)	Manual

7. HAZARDOUS SUBSTANCES STORAGE AND HANDLING:

- a. To ensure the risks associated with the use of hazardous substances are minimised, no hazardous substance will be brought on site without approval from Site Head - Projects. Its subsequent use will be subject to appropriate controls to ensure personnel know how to use the substance safely and only use the substance with the correct PPE.
- b. It is mandatory that before any substance likely to affect the health or safety of persons is brought to the site, a Material Safety Data Sheet (MSDS) shall be provided at least seven days prior to the product arrival and a copy maintained at the following locations:
 - i. Site SHE manager/Officer and Site Head Hr & facilities
 - ii. Project Officer /O&M officer
 - iii. At the place of storage of the hazardous substance.
- c. The control of hazardous substances transport, storage and use must comply as per the requirements of "Hazardous Wastes (Handling and Management) Rules 2003 (as amended from 1989)" and the "Manufacture, Storage and import of Hazardous wastes Rules 1989".

8. RECORDS:

Sr. No	Title	Legal Doc	Purpose	Retention Period
1	Consent for disposal agency	CTO	To ensure that the agency is legally authorized for collection of the hazardous waste being disposed	3 Years
2	Generation of hazardous waste	Form 3	To check the content of hazardous waste being collected does not exceed the limit defined in the CTO	3 Years
3	Labeling	Form 12	To define the category of hazardous waste being disposed	3 Years
4	Manifest	Form 13	To define the details of waste disposed , authorized agency , category of waste , amount being disposed and the time of disposal	3 Years
5	TREM card	Form 11	In case of transportation of waste	3 Years
6	Annual return	Form 4	To be done in January of every year	3 Years
7	Accident reporting and follow up	Form 14	To be filled in case of accident of waste carrying vehicle.	3 years
8	Waste monitoring plan	Annexure-20.1	To monitor the waste management system	1 Years

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9. WASTE MONITORING PLAN:

Annexure: 20.1

Sr. No.	Month	Site Name	Cotton waste Kg	Used Oil LTR	Plastic & Rubber Waste-Kg	Empty Drums Unit	E- Waste Kg	Disposed To	Date of Disposal	Remarks
1	APR.									
2	MAY									
3	JUNE									
4	JULY									
5	AUG.									
6	SEPT.									
7	NOV.									
8	OCT.									
9	DEC.									
10	JAN.									
11	FEB.									
12	MAR.									
13	TOTAL									

10.ANTICIPATED CONSTRUCTION WASTE STREAMS:

A number of difference waste streams are likely to arise during construction of the wind farm. As per the requirements of Section 2 herein, the Contractor shall identify all waste streams and provide an estimate of expected waste volumes for each waste type generated within the waste stream

11. WASTE FROM WELFARE FACILITIES:

This will primarily be food waste, paper, plastics, glass and other typically domestic refuse generated in the offices and canteen areas within the site compound, as well as on site. All waste of this type shall be stored in an appropriate location, protected from wind, rain and wild animals. Facilities will be provided to segregate waste into appropriate waste streams (glass, paper etc) and minimise volumes of material stored (e.g. folding and baling of cardboard waste).

There is no anticipated requirement for a separate construction workers camp at Wind sites.

12. CONCRETE:

Where possible a settlement and re-circulation system for water reuse shall be considered for water used in concrete batching and wash out areas.

Any waste water generated from concrete batching shall be adequately treated to deal with suspended solids and high alkalinity before discharge.

13. PACKAGING:

This includes waste materials arising from packaging of equipment or materials brought onto site, including paper, plastics and wood used for packaging turbine components, reinforcing rods, concrete formwork, cement and other raw materials. Wherever possible, packaging will be returned to originator for reuse ahead

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of recycling or disposal. Or they will be stored on site in a sealed skip within the construction compound and disposed of.

14.WASTE METALS:

Where there is residual metal such as from steel reinforcing rods for concrete and cabling, it is expected to have some commercial value and be suitable for re-use or recycling

15.CLEANING ACTIVITIES:

Cleaning activities (e.g. for plant, vehicles, wheel washes, concrete truck wash out etc) can produce large volumes of polluted water. No cleaning activities must therefore be carried out in the wind site.

16. POWER TO AMEND:

- a) Any change of the guideline shall be approved by the Head - GCHR.
- b) The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding

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Date: 01.04.2022		

Sr. No.	Month	Site Name	Cotton waste Kg	Used Oil LTR	Plastic & Rubber Waste-Kg	Empty Drums Unit	E- Waste Kg	Disposed To	Date of Disposal	Remarks
1	APR.									
2	MAY									
3	JUNE									
4	JULY									
5	AUG.									
6	SEPT.									
7	OCT.									
8	NOV.									
9	DEC.									
10	JAN.									
11	FEB.									
12	MAR.									
13	TOTAL									

Store in Charge_____

Safety in Charge_____

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Sr. No.	Month	Site Name	Cotton waste Kg	Used Oil LTR	Plastic & Rubber Waste-Kg	Empty Drums Unit	E- Waste Kg	Disposed To	Date of Disposal	Remarks
1	APR.									
2	MAY									
3	JUNE									
4	JULY									
5	AUG.									
6	SEPT.									
7	OCT.									
8	NOV.									
9	DEC.									
10	JAN.									
11	FEB.									
12	MAR.									
13	TOTAL									

Store in Charge_____

Safety in Charge_____

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	VISITOR SAFETY POLICY	Guideline No IGESL SITE/HSE/021
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6. OBJECTIVE:

It is the policy of IGESL that visitors are made to feel welcomed and are not subjected to unacceptable risks to their health & safety. IGESL not only believes in the safety & security of its personnel's, but is also equally committed to the safety and security of the visitors who visit its various wind site locations. With these objectives the visitor's safety policy is being rolled out.

7. SCOPE:

This guideline shall be applicable across all sites of IGESL, IWL & RESCO.

8. WHO CAN BE CATEGORISED AS VISITORS:

Following can be considered as visitors:

- Representatives of Customers, Developers, Suppliers, Vendors, Insurance Companies, Agencies who are in business dealing with the Company.
- Visitors from other locations of IGESL, GFL, IWL, IRL & RESCO for official visits.
- Visitors from Government agencies & various regulatory agencies.
- Visitors from different organization and local villagers
- Visitors from Educational Institutes & Schools.
- Visitors from the Press.
- Personal visitors of employees.
- Ex-employees.

9. GENERAL SAFETY GUIDELINE FOR ALL VISITORS:

- No visitors shall be allowed to carry any firearms, stick, knife or any pointed articles inside any locations under any circumstances.
- All Visitors shall have to fill in the Visitors pass, make necessary entry in the Visitors Register and shall be handed over a "Visitor Identity card", which the visitor shall display during all the time during his visit in the location.
- All visitors, in general, shall be subject to frisking by the Security Personnel at the time of entry.
- NO Photography shall be allowed inside the premises, only with prior permission of the Site Head.
- Special permission to be obtained for visitors who are visiting Wind Turbine Sites for seeing the turbine from inside from the Site Head of Infrastructure or Site Head O & M. The employees organizing the visit are responsible for obtaining the permission.
- The visitors must wear the prescribed personal protective equipment's at all times while entering the Wind Sites Offices and Sites.
- All our facilities are "NO SMOKING ZONES". Chewing tobacco, betel nuts, pan masala and alcohol is strictly prohibited.

10. GENERAL PROCEDURE FOR ENTRY OF VISITORS:

The procedure to be followed for the visitors entry, in general shall be as follows:

- Visitors to be received at the main gate GSS/CMS / Office at the Wind Site location and inform the security guard his desire to meet the concerned IGESL / RESCO Employee.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	VISITOR SAFETY POLICY	Guideline No IGESL SITE/HSE/021
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- b. The Security shall allow parking of the car at the designated area only. If the vehicle is parked inside the premises, vehicle shall be checked, while visitor leaves the premises.
- c. Visitor shall be asked to fill in the visitor's register maintained at the main entrance in the prescribed format (Annexure-I) and declare the items he/she is carrying. Items, which are usually carried, are as follows:
 - I. Laptop
 - II. CD/Pen drive/Floppy disc etc. – these items shall not be allowed in case of an unaccompanied visitor
 - III. Camera - this item shall not be allowed in case of an unaccompanied visitor
 - IV. Mobile phone
 - V. Samples of items etc.

All these items shall be entered into the visitor's pass in the prescribed format (Annexure-II) and a visitor's pass handed over to the visitor. Along with this, a visitor card in the prescribed format (Annexure-III). The Security shall brief each and every Visitor of the 'General Guidelines for All Visitors' as given in Clause 5 above before the Visitors Card is handed over.

- d. While returning, the security guard shall ensure that the visitor hands over the visitor's card & visitor's pass duly signed by the person he has met before he leaves the premises. Security guard shall also check the items, if any, which being taken by the visitor out of the office. His personal belongings shall be matched with those as mentioned in the visitor's pass.

11. POWER TO AMEND:

- a. Any change of the guideline shall have to be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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VISITOR'S REGISTER

Date: _____

Page No.: _____

[illegible]

VISITOR'S PASS



Inox Green Energy Services Limited

Inox Towers, Plot No 17, Sector – 16 (A)
Noida 201301, UP

Note: Visitors must get this pass signed from the persons visited at the time of departure and return to security

No.: _____ Date: _____

Mr./Ms. _____

Address _____

To Meet Mr./Ms. _____

Deptt. _____

Purpose of Visit _____

Item being carried by the Visitor:

Laptop ☐

Mobile Phone ☐

Other Material ☐

Please Specify: _____

Item being deposited by the Visitor:

Fire Arm ☐

Hazardous/Combustible Substance ☐

CD/Pen drive/Floppy drive ☐

Camera ☐

Luggage ☐

Other Material ☐

Please Specify: _____

Time In	Time Out	Signature:
		Visitor:
		Recipient Name:

VISITOR'S PASS

Resco Global Energy Services Limited
Inox Towers, Plot No 17, Sector – 16 (A)
Noida 201301, UP

Note: Visitors must get this pass signed from the persons visited at the time of departure and return to security

No.: _____ Date: _____

Mr./Ms. _____

Address _____

To Meet Mr./Ms. _____

Deptt. _____

Purpose of Visit _____

Item being carried by the Visitor:

Laptop ☐

Mobile Phone ☐

Other Material ☐

Please Specify: _____

Item being deposited by the Visitor:

Fire Arm ☐

Hazardous/Combustible Substance ☐

CD/Pen drive/Floppy drive ☐

Camera ☐

Luggage ☐

Other Material ☐

Please Specify: _____

Time In	Time Out	Signature
		Visitor:
		Recipient Name:

VISITOR CARD

INOXGreen
ENERGY SERVICES LIMITED

V

**VISITOR
IGESL– 001**

If found return to:

Inox Green Energy Services Ltd.
33/11 KV Sub Station
Vill. Bhatkheda, Post- Kalukheda, Teh- Jaora
Dist. Ratlam, MP - 457226

General Safety Guideline for All Visitors

A. No visitors shall be allowed to carry any firearms, stick, knife or any pointed articles inside any locations under any circumstances.

B. All Visitors shall have to fill in the Visitors pass, make necessary entry in t

General Safety Guideline For All Visitors

A. No visitors shall be allowed to carry any firearms, stick, knife or any pointed articles inside any locations under any circumstances.

B. All Visitors shall have to fill in the Visitors pass, make necessary entry in the Visitors Register and shall be handed over a "Visitor Identity card", which the visitor shall display during all the time during his visit in the location.

C. All visitors, in general, shall be subject to frisking by the Security Personnel at the time of entry.

D. NO Photography shall be allowed inside the premises, only with prior permission of the Site Head.

E. Special permission to be obtained for visitors who are visiting Wind Turbine Sites for seeing the turbine from inside from the Site Head of Infrastructure or Site Head O & M.

F. The employees organizing the visit are responsible for obtaining the permission.

G. The visitors must wear the prescribed personal protective equipment's at all times while entering the Wind Sites Offices and Sites.

h. H. All our facilities are "NO SMOKING ZONES". Chewing tobacco, betel nuts, pan masala and alcohol is strictly

VISITOR CARD

**RESCO GLOBAL WIND
SERVICES PVT. LTD.**



**VISITOR
RESCO– 001**

If found return to:

Resco Global Wind Services Pvt. Ltd.
428/2, Satyam Complex,
Simplex Business Park, Nakthrana,
Near Essr Petrol Pump,
Naktharana, Bhuj, Gujarat-370615,

General Safety Guideline for All Visitors

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G. The visitors must wear the prescribed personal protective equipment's at all times while entering the Wind Sites Offices and Sites.

h. H. All our facilities are “NO SMOKING ZONES”. Chewing tobacco, betel nuts, pan masala and alcohol is strictly

**Undertaking for visitors Before
Climbing Turbine**

Date: _____

Site Name: _____

Time: _____

Location No: _____

Name of person/s: _____

Designation: _____

Company: _____

Purpose of visit: _____

I _____ aged _____ years working with the above mentioned company hereby confirm that I am climbing the wind turbine tower at the above mentioned location on my risk. I have understood all the safety rules and regulations as explained by INOX Site in charge/Authorized representative. Further I confirm that I will follow all the rules and regulations in force while climbing the tower. INOX will not be responsible in any case of accident/injuries caused to me by whatsoever reasons.

I hereby confirm that I do not have any vertigo problem (fear of height) and I am physically and medically fit to climb tower, and I will produce Medical fitness certificate when asked by INOX representative as well.

Name of Visitor:

Signature

Signature of INOX Representative

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	REWARD AND RECOGNITION	Guideline No IGESL SITE/HSE/022
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1. OBJECTIVE:

The company believed in the principle that safety should be a way of life and every encouragement should be provided to ensure that all our staff as well as contractors and contractor's employees voluntarily adopt the culture of safety in their daily working. The Reward and Recognition scheme in safety has been designed to motivate employees by rewarding and recognizing their efforts and achievements in Safety.

2. SCOPE:

The Policy is applicable to all IGESL, RESCO sites/staff from O&M and Infrastructure.

3. SCHEME:

Level of Award	Name of Award	Purpose of Award	Frequency of award	Nature of Award
IGESL Employees	The Hawk Eye Award	This award is for IGESL / RESCO staff, employees reporting maximum Unsafe Acts / conditions and Near Misses to the Site Safety Coordinator with evidence. This will ensure proactively all unsafe acts and conditions are rectified and potential hazards eliminated. At least 5 such unsafe acts/conditions and/or near miss to be reported by an individual to become eligible for consideration of the award	Monthly	First- Gift/Gift voucher ₹ 1000/-and appreciation certificate. Second- Gift/Gift voucher ₹ 750/-and appreciation certificate Third- Gift /Gift voucher ₹ 500/-and appreciation
IGESL Site	Safety Improvement Award	To recognise the Site which has shown the maximum improvement in % the Quarterly HSE audit conducted by the no Reportable Injury during the financial year	Quarterly	A Safety Improvement Recognition Certificate to be given to the site.
State Level	Safety Excellence Award	To recognise the State in which there has been NIL accidents/incidence reported	Annual	Safety Excellence Trophy to be given to the State in a function held on 4 th March every year with a day-long HSE celebration

4. SPOTON RECOGNITION:

Spontaneous recognition let employees know that their hard work is valued and is being watched. It doesn't have to cost anything, it can be done in less than five minutes and the results can have a lasting impact. We have been spontaneously recognizing people for their work. It's time we recalibrate ourselves and give it a structure to further institutionalize the process. Therefore, "SPOTON" It is "on the spot recognition programme" across the Company. It is to encourage all to build a culture of recognition and appreciation and increase employee engagement and retention. The programme has 15 identified employee behaviours which an employee should exhibits in his/ her job which calls for 'discretionary' effort on the part of the employee. As a Company we want to accentuate these positive and discretionary efforts and behaviour through Spontaneous Recognition. Each of the 15 behaviours can be recognized under 15 Recognition programme which is given below. An employee can be recognized spontaneously whenever he exhibits any of the 15 behaviours by his Supervisors. He /she needs to be recognized "instantaneously in public "on the spot". Therefore, let's begin the search and do some.

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Note: Every employee who has their individual account on SGC portal can recognise any one who meets the criteria for SPOTON Recognition.

The 15 Behaviors		
SPARSH Personal Touch		Employee going out of his way to help another employee in his personal life and extends a personal help to another employee in the hour of need
A-TEAM Team Working		A team of employees working in close collaboration and completing an assignment within time
EUREKA Out of Box Thinking		Employee exhibiting out of box and lateral thinking to solve a problem or bottleneck
SAFETY SAMRAT Work Place Safety		Employee giving a solution and ensure implementation of improvement to remove unsafe condition
ACE Initiative and Resilience		Employee ensuring by his own commitment to resolve an old issue
CARE Customer Orientation		Employee showing customer orientation and providing "wow" service to internal and external customers
OVER & BEYOND Initiative beyond his assignment		Employee going beyond his normal work and role and lends support to others to complete an assignment
MAKING A DIFFERENCE Excellence Mentality		Employee completing a complex assignment with best of efficiency and quality
CHEER THE PEER Appreciation to colleagues		Employee appreciating the contribution of his colleague for lending support or helping him in his work
HATS OFF Cost optimization and control		Employee implementing improvement which reduce cost in his area
MASTER MIND Quality improvement		Employee implementing idea to improve quality of product
WHALE DONE Positive attitude		Employee showing positive attitude in case of a failure and comes out successful finally
GREEN AND CLEAN Environmental concern		Employee taking action to improve environment and cleanliness in the workplace
APPOLLO Self development		Employee taking the self initiative to develop himself by acquiring knowledge say be getting a degree/certification etc.
BULLS EYE Mental agility		Employee shows common sense and alertness and ensuring immediate mitigation to a problem.

5. POWER TO AMEND:

- Any change of the manual shall be approved by the Head - GCHR.
- The management shall have the overriding right to withdraw and / or amend the manual at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	JOB SAFETY ANALYSIS (JSA) & HIRA	Guideline No IGESL SITE/HSE/023
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1. OBJECTIVE:

It is the policy of IGESL & RESCO that all of the day to day activities of site must be analyzed to mitigate the risk of any incident, accident, or near miss during work. For this detail work steps must be known to all teams along with the hazards involved along with the activities. Job safety analysis is a part of job execution and all of the team must aware of it.

2. SCOPE:

This guideline shall be applicable across all sites of IGESL & RESCO.

3. Job Safety Analysis & HIRA Training (JSA)

The JSA/HIRA components of the safety program are designed to train supervisor to analyze the tasks to be performed, the identification and elimination of hazards and communications with the in crews in how to do the job safely. They entertain their team to work safely on the job through implementation of the program, during toolbox meetings. Site safety coordinators will take an active role in the evaluation of JSA's. It has been observed that routine and common tasks can have serious safety risks that can be eliminated by a proper JSA review. Site safety managers shall be responsible to enlist the required technical assistance to assure that thorough and complete reviews are performed on all JSA's & HIRA's.

4. JOB SAFETY ANALYSIS (JSA)

Contractors/Subcontractor shall submit to the Site Project Head or the Site O and M Head as the case may be and to the Site Safety Coordinators a Method statement (MS) for each construction activity or O and M activity planned to complete their scope of work. These MS will be reviewed by the Site Safety Coordinators who shall determine the need for a JSA. All JSA's will be in writing and same should be prepared by concerned job supervisors/Engineers with the help of Safety managers.

A specific JSA shall be required where the task is known to have a significant hazard, where the task is complex, where there may be hidden hazards or where a high degree of coordination between workers is required.

All JSA shall be done in the approved format as given in Annexure - I

Compulsorily a JSA shall be required for the following tasks:

- a. Any new or non-routine task that has not been performed before on site that may be hazardous.
- b. All permit work, confined space entry, hot work, lockout-tag out, electrical, etc
- c. Work including high levels of pressure, electrical voltage, chemical concentration, heights, noise, etc.
- d. Deep excavations, pile driving, excavations near existing /lines or cables.
- e. Use of a crane supported work platform
- f. Pneumatic or hydro testing of pipe lines or equipment
- g. Critical lifts, major lifts, heavy lifts, high lifts equipment
- h. Erection of tall structures, elevators, tower cranes, ringer cranes, etc
- i. Elevated work where no engineering fall protection is provided.
- j. Work over or near water.
- k. Work over or near high voltage power lines.

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- l. Work involving specialized equipment: drilling pile
- m. Use of to hazardous substances: chemical cleaning
- n. Use of explosives or radiation sources
- o. Commissioning activities
- p. WTG Maintenance work
- q. GSS maintenance work
- r. USS maintenance Work
- s. Replacement of Heavy equipment's
- t. Any new technology or tasks identified at monthly safety meeting.

5. Steps for conducting a JSA

STEP 1 - Involving employees.

It is very important to involve employees in the hazard analysis process. They have a unique understanding of the job, and this knowledge is invaluable for finding hazards. Involving employees will help minimize oversights, ensure a quality analysis, and get workers to "buy in" to the solutions because they will share ownership in their safety and health program.

STEP 2 - Conduct a preliminary job review.

Discuss with employees the hazards they know exist in their current work and surroundings. Brainstorm with them for ideas to eliminate or control those hazards. ***If any hazards exist that pose an immediate danger to an employee's life or health, take immediate action to protect the worker.*** Any problems that can be corrected easily should be corrected as soon as possible. We shall not wait to complete a Job Hazard Analysis. This will demonstrate your commitment to safety and health and enable us to focus on the hazards and jobs that need more study because of their complexity. For those hazards determined to present unacceptable risks, evaluate types of hazard controls.

STEP 5 - List, rank, and set priorities for hazardous jobs.

List jobs with hazards that present unacceptable risks, based on those most likely to occur and with the most severe consequences. These jobs should be your first priority for analysis.

A Job Hazard Analysis can be conducted on many jobs in your workplace. Priority should be given to jobs which are high risk as per the "Risk Matrix"

Using the Risk Matrix

The Risk Matrix is a simple tool to identify which tasks are more hazardous from the other and helping in prioritizing for conducting a JHA. Consider the consequences and likelihood for each of the identified hazards and use the table to obtain the risk level.

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RISK MATRIX			Consequence				
			1 – Insignificant Dealt with by in-house first aid, etc. Minor repairs. No plant and production affect	2 – Minor Medical help needed. Treatment by medical professional/hospital outpatient, etc. Minor breakdown and/or minor stoppage. No loss time	3 – Moderate Significant non-permanent injury. Overnight hospitalization (inpatient). Loss time. Damage to equipment and stoppage for a shift but not more than a day	4 – Major Extensive permanent injury(eg loss of finger/s, amputation).Extended hospitalization. Compensation case. Extensive damage to machinery leading to more than a day's stoppage. However no external impact	5 – Catastrophic Death. Permanent disabling injury (e.g. blindness, loss of hand/s, quadriplegia), explosion, external impact, damage to property, extended day plant shut down. Legal prosecution by authorities
L i k e l i h o o d	A	Almost certain to occur in most circumstances	High (H)	High (H)	Extreme (X)	Extreme (X)	Extreme (X)
	B	Likely to occur frequently	Moderate (M)	High (H)	High (H)	Extreme (X)	Extreme (X)
	C	Possible and likely to occur at some time	Low (L)	Moderate(M)	High (H)	Extreme (X)	Extreme (X)
	D	Unlikely to occur but could happen	Low (L)	Low (L)	Moderate(M)	High (H)	Extreme (X)
	E	May occur but only in rare and exceptional circumstances	Low (L)	Low (L)	Moderate (M)	High (H)	High (H)

Once the level of risk has been determined the following table may be of use in determining the priorities to act and to institute the control measures. Address risks with the highest level first.

Extreme	Act immediately to mitigate the risk.Either eliminate, substitute or implement engineering control measures.	Remove the hazard at the source. An identified extreme risk does not allow scope for the use of administrative controls or PPE , even in the short term.
High	Act immediately to mitigate the risk. Either eliminate, substitute or implement engineering control measures. If these controls are not immediately accessible, set a timeframe for their implementation and establish interim risk reduction strategies for the period of the set timeframe.	An achievable timeframe must be established to ensure that elimination, substitution or engineering controls are implemented. NOTE: Risk (and not cost) must be the primary consideration in determining the timeframe. A timeframe of greater than 6 months would generally not be acceptable for any hazard identified as high risk.

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Medium	Take reasonable steps to mitigate the risk. Until elimination, substitution or engineering controls can be implemented, institute administrative or personal protective equipment controls. These “lower level” controls must not be considered permanent solutions. The time for which they are established must be based on risk. At the end of the time, if the risk has not been addressed by elimination,	Interim measures until permanent solutions can be implemented: Develop administrative controls to limit the use or access. Provide supervision and specific training related to the issue of concern. (See Administrative Controls below)
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STEP 5 - Outline the steps or tasks.

Nearly every job can be broken down into job tasks or steps. When beginning a Job Hazard Analysis, watch the employee perform the job and list each step as the worker takes it. Be sure to record enough information to describe each job action without getting overly detailed.

Avoid making the breakdown of steps so detailed that it becomes unnecessarily long or so broad that it does not include basic steps. You may find it valuable to get input from other workers who have performed the same job. Later, review the job steps with the employee to make sure you have not omitted something. Point out that you are evaluating the job itself, not the employee's job performance. Include the employee in all phases of the analysis -- from reviewing the job steps and procedures to discussing uncontrolled hazards and recommended solutions.

Sometimes, in conducting a Job Hazard Analysis, it may be helpful to photograph or videotape the worker performing the job. These visual records can be handy references when doing a more detailed analysis of the work.

STEP 6 - Identify workplace hazards at each job steps

A Job Hazard Analysis is an exercise in detective work. Your goal is to discover the following:

- What can go wrong?
- What are the consequences?
- How could it arise?
- What are other contributing factors?
- How likely is it that the hazard will occur?

To make your Job Hazard Analysis useful, document the answers to these questions in a consistent manner. Describing a hazard in this way helps to ensure that your efforts to eliminate the hazard and implement hazard controls help target the most important contributors to the hazard.

Good hazard scenarios describe:

- Where it is happening (environment),
- Who or what it is happening to (exposure),
- What precipitates the hazard (trigger),
- The outcome that would occur should it happen (consequence), and
- Any other contributing factors.

Rarely is a hazard a simple case of one singular cause resulting in one singular effect. More frequently, many contributing factors tend to line up in a certain way to create the hazard.

Common Hazards and Descriptions

Hazard Identity No	Hazards	Hazard Descriptions
1	Chemical (Toxic)	A chemical that exposes a person by absorption through the skin,

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		inhalation, or through the bloodstream that causes illness, disease, or death. The amount of chemical exposure is critical in determining hazardous effects. Check Material Safety Data Sheets (MSDS), for chemical hazard information.
2	Chemical (Flammable)	A chemical that, when exposed to a heat ignition source, results in combustion. Typically, the lower a chemical's flash point and boiling point, the more flammable the chemical. Check MSDS for flammability information.
3	Chemical (Corrosive)	A chemical that, when it comes into contact with skin, metal, or other materials, damages the materials. Acids and bases are examples of corrosives.
4	Explosion (Chemical Reaction)	Self explanatory.
5	Explosion (Over Pressurization)	Sudden and violent release of a large amount of gas/energy due to a significant pressure difference such as rupture in a boiler or compressed gas cylinder.
6	Electrical (Shock/Short Circuit)	Contact with exposed conductors or a device that is incorrectly or inadvertently grounded, such as when a metal ladder comes into contact with power lines. 60Hz alternating current (common house current) is very dangerous because it can stop the heart.
7	Electrical (Fire)	Use of electrical power that results in electrical overheating or arcing to the point of combustion or ignition of flammables, or electrical component damage.
8	Electrical (Static/ESD)	The moving or rubbing of wool, nylon, other synthetic fibers, and even flowing liquids can generate static electricity. This creates an excess or deficiency of electrons on the surface of material that discharges (spark) to the ground resulting in the ignition of flammables or damage to electronics or the body's nervous system.
9	Electrical (Loss of Power)	Safety-critical equipment failure as a result of loss of power.
10	Ergonomics (Strain)	Damage of tissue due to over exertion (sprains and strains) or repetitive motion.
11	Ergonomics (Human Error)	A system design, procedure, or equipment that is error-provocative. (A switch goes up to turn something off).
12	Excavation (Collapse)	Soil collapse in a trench or excavation as a result of improper or inadequate shoring. Soil type is critical in determining the hazard likelihood.
13	Fall (Slip, Trip)	Conditions that result in falls (impacts) from height or traditional walking surfaces (such as slippery floors, poor housekeeping, uneven walking surfaces, exposed ledges, etc.)
14	Fire/Heat	Temperatures that can cause burns to the skin or damage to other organs. Fires require a heat source, fuel, and oxygen.
14	Mechanical/Vibration (Chaffing/Fatigue)	Vibration that can cause damage to nerve endings, or material fatigue that results in a safety-critical failure. (Examples are abraded slings and ropes, weakened hoses and belts.)
15	Mechanical Failure	Self explanatory; typically occurs when devices exceed designed capacity or are inadequately maintained.
16	Mechanical	Skin, muscle, or body part exposed to crushing, caught-between, cutting, tearing, shearing items or equipment.
17	Noise	Noise levels (>85 dBA 8 hr TWA) that result in hearing damage or inability to communicate safety-critical information.
18	Radiation (Ionizing)	Alpha, Beta, Gamma, neutral particles, and X-rays that cause injury (tissue damage) by ionization of cellular components.
19	Radiation (Non-Ionizing)	Ultraviolet, visible light, infrared, and microwaves that cause injury to

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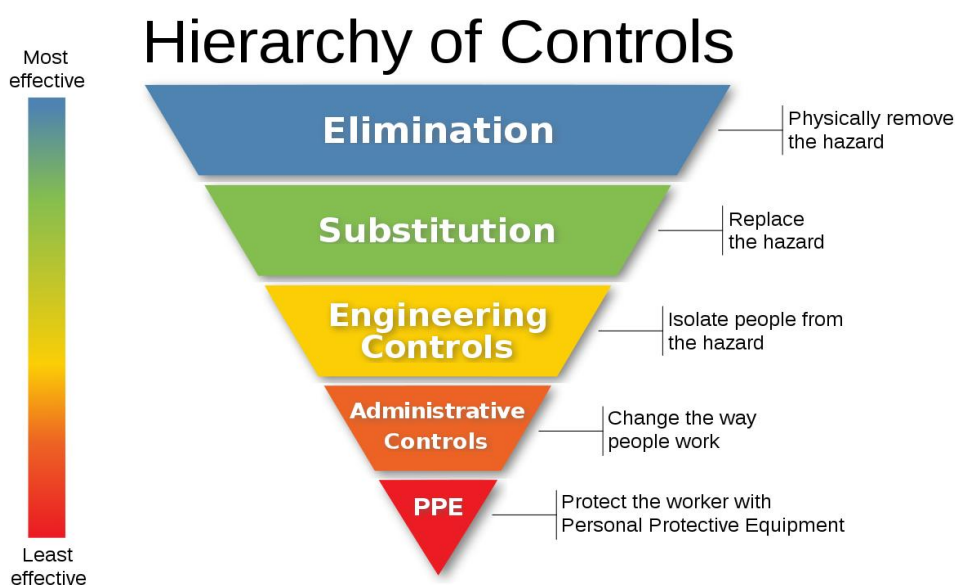
		tissue by thermal or photochemical means.
20	Struck By (Mass Acceleration)	Accelerated mass that strikes the body causing injury or death. (Examples are falling objects and projectiles.)
21	Struck Against	Injury to a body part as a result of coming into contact of a surface in which action was initiated by the person. (An example is when a screwdriver slips.)
22	Temperature Extreme (Heat/Cold)	Temperatures that result in heat stress, exhaustion, or metabolic slow down such as hypothermia.
23	Visibility	Lack of lighting or obstructed vision that results in an error or other hazard.
24	Weather Phenomena (Rain/Wind)	Self explanatory.

STEP 7 - Establishing Control Measures

After reviewing your list of hazards with the employee, consider what control methods will eliminate or reduce them. The most effective controls are engineering controls that physically change a machine or work environment to prevent employee exposure to the hazard. The more reliable or less likely a hazard control can be circumvented, the better. If this is not feasible, administrative controls may be appropriate. This may involve changing how employees do their jobs. Discuss your recommendations with all employees who perform the job and consider their responses carefully. If you plan to introduce new or modified job procedures, be sure they understand what they are required to do and the reasons for the changes.

Hazards Control Measures

Information obtained from a Job Hazard Analysis is useless unless hazard control measures recommended in the analysis are incorporated into the tasks. Managers should recognize that not all hazard controls are equal. Some are more effective than others at reducing the risk. The order of precedence and effectiveness of hazard control is the following:



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1. Elimination
2. Substitution
3. Engineering controls.
4. Administrative controls.
5. Personal protective equipment (PPE's).

1. Elimination:

- Eliminating the hazard and risk is the highest level of control in the hierarchy, followed by reducing the risk through substitution, isolation and engineering controls, then reducing the risk through administrative controls

2. Substitution:

- Substitution is a form of hazard elimination, and the two may be combined on some hierarchy of hazard control lists. **Substitution involves replacing something that is hazardous, with something that is not hazardous**

3. Engineering controls include the following:

- Elimination/minimization of the hazard -- Designing the facility, equipment, or process to remove the hazard, or substituting processes, equipment, materials, or other factors to lessen the hazard;
- Enclosure of the hazard using enclosed cabs, enclosures for noisy equipment, or other means;
- Isolation of the hazard with interlocks, machine guards, blast shields, welding curtains, or other means; and
- Removal or redirection of the hazard such as with local and exhaust ventilation.

4. Administrative controls include the following:

- Written operating procedures, work permits, and safe work practices;
- Exposure time limitations (used most commonly to control temperature extremes and ergonomic hazards);
- Monitoring the use of highly hazardous materials;
- Alarms, signs, and warnings;
- Buddy system; and
- Training.

5. Personal Protective Equipment (PPE's):

- such as respirators, hearing protection, protective clothing, safety glasses, and hardhats -- is acceptable as a control method in the following circumstances:
- When engineering controls are not feasible or do not totally eliminate the hazard;
- While engineering controls are being developed;
- When safe work practices do not provide sufficient additional protection; and
- During emergencies when engineering controls may not be feasible.

Use of one hazard control method over another higher in the control precedence may be appropriate for providing interim protection until the hazard is abated permanently. In reality, if the hazard cannot be eliminated entirely, the adopted control measures will likely be a combination of all three items instituted simultaneously.

STEP 8 - Review Job Safety Analysis

Periodically reviewing Job Hazard Analysis ensures that it remains current and continues to help reduce workplace accidents and injuries. Even if the job has not changed, it is possible that during the review process you will identify hazards that were not identified in the initial analysis.

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It is particularly important to review Job Hazard Analysis if an illness or injury occurs on a specific job. Based on the circumstances, you may determine that you need to change the job procedure to prevent similar incidents in the future. If an employee's failure to follow proper job procedures results in a "close call," discuss the situation with all employees who perform the job and remind them of proper procedures. Any time you revise a Job Hazard Analysis, it is important to train all employees affected by the changes in the new job methods, procedures, or protective measures adopted.

HIRA- (HAZARD IDENTIFICATION & RISK ASSESSMENT):

INTRODUCTION:

A HIRA is a risk assessment tool that can be used to assess which hazards pose the greatest risk in terms of how likely they are to occur and how great their potential impact may be. It is not intended to be used as a prediction tool to determine which hazard will cause the next emergency

WHY SHOULD I HAVE A HIRA?

One of the core challenges faced by emergency managers is how to prevent, mitigate, prepare, respond and recover from different types of hazards.

Several questions must be asked when faced with this challenge:

- What hazards exist in or near my community?
- How frequently do these hazards occur?
- How much damage can they cause?
- Which hazards pose the greatest threat? This Hazard Identification and Risk Assessment (HIRA) workbook can help guide you in answering these questions.

A HIRA CAN:

- Help you to prepare for the worst and/or most likely hazards.
- Save time by isolating any hazards which can not affect your community.
- Allows for the creation of emergency plans, exercises and training based on the most likely and/or highest risk scenarios.
- Helps your program to become proactive rather than just reactive.

THE HIRA PROCESS:

There are four steps to create and maintain a HIRA:



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1. **Hazard Identification** - In this step the hazards that could impact your community are separated from those that cannot. This requires a review of all hazards and their causes to determine whether they may be a threat to your community. This may require the consultation of the scientific community, historical records and government agencies.
2. **Risk Assessment** - In this step the level of risk for each hazard is examined. This may involve speaking with hazard experts, researching past occurrences and possible scenarios. The likelihood of the hazard occurring and the potential impacts of the hazard on people, property, the environment, business and finance and critical infrastructure should be examined.
3. **Risk Analysis** - The information collected in the risk assessment step will be analyzed in this step. The desired outcome of the risk analysis is the ranking of the hazards. This highlights the hazards that should be considered a current priority for your emergency management program.
4. **Monitor and Review** - It is important to remember that a HIRA is an ongoing process and hazards and their associated risks must be monitored and reviewed.

5. POWER TO AMEND:

- a. Any change of the guideline shall have to be approved by the Head - GCHR.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Approved By _____

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Sr. No.	Activity	Cause of Hazard	OH&S Hazard	Routine / Non Routine/ Emergency Activity	Risk Analysis			Legal Req.	Is Risk Tolerable ??	Present Risk Control Mechanism	Additional Control Measures (if required)
					Severity (A)	Prob. of Occurrence (B)	Risk Factor (A x B)				
		Site Activities									

Prepared By:_____

Reviewed By:_____

Approved By:_____

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	CONSEQUENCE MANAGEMENT and IGESL/RESCO HSE CARDINAL RULES AND PROGRESSIVE DISCIPLINE GUIDELINE	Guideline No IGESL SITE/HSE/024
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1. OBJECTIVE

The objective of this Policy is to establish the process of corrective counselling and disciplinary actions in response to safety misconduct or violation for IGESL & RESCO employees and, as well as, Contractors and their employees.

2. SCOPE

This Policy is applicable to all IGESL & RESCO employees, Contractors and Sub Contractors of IGESL & RESCO, including all their manpower.

3. FINANCIAL PENALTY FOR HSE VIOLATION by CONTRACTORS

- All Contractors shall be penalised as per the Annexure 25.1 for safety violations of their employees at site. Annexure 25.1 shall be incorporated while awarding any Purchase Order (PO) or Work Order.
- Such penalty shall be affected by deducting the amount from bill of the contractor.
- Such penalty shall be jointly ratified by the Infrastructure/O and M Site In charge and Site Safety Coordinator and send to the accounts department.

4. PROGRESSIVE DISCIPLINE IN CASE OF VIOLATION OF SAFETY AND HEALTH POLICY AND IGESL HSE CARDINAL RULES

- To ensure a safety culture in our day to day work it is essential that each employee takes utmost care in following all the safety rules, regulations and instructions of the company. Employees who commit safety violations put themselves and others in danger and expose the company to prosecution and disrepute. It is, therefore, important that the company's safety policies and practices are enforced equally to all levels of employees to ensure discipline. The purpose of discipline is not punishment, but reinforcement of an appropriate standard of conduct for all employees. Where discipline is required, the Company shall adopt a progressive discipline approach.

ii. Responsibility

a. Employees

It is the responsibility of all employees to understand and comply with all Company Health & Safety policies and procedures, general safety rules, as well as regulations.

b. Supervisors/Managers

It is part of Supervisors and/or Managers' responsibility to enforce "Progressive Disciplinary Action" when violations of the Company's health & safety policies and procedures, general safety rules and regulations occur. Any failure by supervisors and/or management to immediately correct a health & safety violation, unsafe act or unsafe condition, is equivalent of the supervisor or management giving his permission to violate the established health and safety standards.

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iii. Violations are any deliberate deviations from the safety rules, procedures, instructions and regulations. Breaches in these rules could be accidental, unintentional or deliberate.

a. Minor Violation

It may be defined as a behaviour in opposition to the rule, procedure or instruction which has or could have resulted in minor injury to self or others or cause minor damage to machinery.

b. Serious Violation

It may be defined as a behaviour in opposition to the rule, procedure or instruction which has or could have resulted in grievous hurt to self and others resulting in loss time accident or resulted in damage to property and machinery which needs to be corrected immediately to ensure continuous operation of site.

c. Major Violation

It may be defined as a behaviour in opposition to the rule, procedure or instruction which has or could have resulted to fatality or major disaster leading to damage to machinery and property.

d. Cardinal Violation

It may be defined as behaviour in violation of any **IGESL/RESCO CARDINAL SAFETY RULES** (See Annexure II) with full knowledge. For any such violation employee shall be asked to immediately show cause within 24 hours of such alleged violation. The Explanation shall be considered by a Committee constituted of the Head (Corporate Group HR), Functional Head and the CEO and the disciplinary action shall be announced which may include loss of employment.

All employees shall be given a copy of the Cardinal rules on their joining and all employees are required to comply with all the Cardinal Rules at any point of time. It may be clearly understood that these Cardinal Rules are life saving rules and any violation tantamount to exposing human life to added peril. No situational explanation shall be expected to be taken into consideration while working in violation of the Cardinal Rules.

The implementation of the Cardinal rules and the reporting of the violations shall be the responsibility of the Site HSE Manager. Any such violation, shall be brought immediately to the notice of Head (Group Corporate HR) and Head – Infrastructure or Head – O and M.

All employees have the “right to refuse” instructions related to work by their supervisor if such work instruction is against any of the IGESL/RESCO Cardinal Rules. Such refusal shall not be construed as a case of in subornation or disobedience on the part of the employee. In case of such refusal the employee concern shall also inform immediately the Site Head about his refusal and the reason thereof.

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iv) Progressive Discipline Matrix

Severity	Level of disciplinary action				
	Counselling	Warning Letter	Suspension for a max of 3 day	Stoppage of Increment	Separation form Service
Minor	Yes	Yes	Yes		
Serious		Yes	Yes	Yes	
Major			Yes	Yes	Yes
Cardinal				Yes	Yes

5. POWER TO AMEND:

- Any change of the guideline shall be approved by the Head - GCHR.
- The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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Mission

Our mission is to adhere to the Cardinal Safety Rules. It helps to keep us Safe from identified Life threatening Potential risks.

No compromises or shortcuts shall be tolerated on any violation of the Cardinal Safety Rules.

All employees, regardless of their titles or position, identified as violating of any of the Cardinal Safety Rules shall make him liable for strict disciplinary action. Such repetition of violation of Cardinal Safety Rules many result in the separation of the concerned employee.

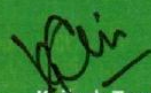
Our ultimate goal is to ensure that "Nobody Gets Hurt" and that everybody returns home safety

Inox Green Energy Services Limited

Cardinal Safety Rules

- 1) **Prohibition of Drugs and Alcohol** - Being in possession of and/or under the influence of drugs or alcohol is prohibited. No one will drive any vehicle under influence of Drugs or Alcohol.
- 2) **Mobile Equipment** - The use of a hand-held mobile telephone while operating a motor vehicle, or any vehicle of the company is prohibited. The use of a mobile telephone while operating an Industrial truck & Crane Operators is prohibited.
- 3) **Isolation** - Isolation of hazardous energy when attempting to repair equipment is mandatory. Proper Tag out/Lock out to isolate equipment is a must.
- 4) **Restricted Areas** - Unauthorized entry into areas that are restricted for operational safety reasons is strictly prohibited. All areas where work is going on in Project shall be cordoned off appropriately.
- 5) **Machinery and working Safety** - Removing or bypassing guards, limit switches, interlocks, or safety devices is prohibited. No work shall be carried out in inadequate illumination and with inadequate or inappropriate jigs/tools and fixtures.
- 6) **Suspended Loads** - Working under a suspended load or lifting a load over any person is prohibited. All suspended load shall be carried out using tested Slings, chain, ropes etc. No work shall be carried out inside or outside a suspended load.
- 7) **Working at Heights** - Fall protection shall be used when working at heights and in accordance with local regulation or facility rule. Fall protection shall be used when working at heights and in accordance with local regulation or facility rule.
- 8) **Personal Protective Equipment** – PPE appropriate for the nature and scale of work and as required by local regulation or facility rule shall be worn at all times by employees, including when handling erection activities, when working inside machine, when handling objects, when performing non-standard activity.
- 9) **Work Permit system** - No work shall be commenced if a work permit is not issued for such Work which have been identified as hazardous in nature and has a process for permit to work associated with it.
- 10) **Incident Reporting** - The immediate reporting of all environmental, safety, and property loss incidents included 'near Misses' by all employees to his immediate Supervisor/Manager is mandatory.

Date – 1st April, 2022



Kailash Tarachandani
(Chief Executive Officer)

Note – All employees shall be given a copy of the Cardinal Safety Rule under acknowledgment. By acknowledging the same, the employees agree to abide by the Cardinal Safety Rule at all points of time and in all work they perform.

Mission

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Our ultimate goal is to ensure that "Nobody Gets Hurt" and that everybody returns home safety.

RESCO Global Wind Services Pvt. Limited

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Doc. No. IGESL/HSE/F-72/Rev.05 Annexure: 24.2 Date: 01.04.2022	PENALTY AGAINST SAFETY VIOLATION	INOXGreen ENERGY SERVICES LIMITED
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PENALTIES LIST

Penalty shall be imposed on the contractors under the following circumstances for breaching the contractual agreements in project work.

Sr. No.	Description of violation	Penalty ₹
1	Not wearing Safety Helmet at construction site or work area	2000/-
2	Not wearing Safety shoes at construction site or work area	2000/-
3	Working at height without safety belt	12000/-
4	Material handling, welding, and cutting without Hand gloves	3000/-
5	Welding / cutting without safety goggles / face shield or any other required PPE	5000/-
6	Smoking in prohibited area(Closed Godowns, storage of flammable material, storage of Gas cylinders)	2500/-
7	Working under the influence of Alcohol or drug	5000
8	Sleeping at work place	500/-
9	Driving beyond speed limit	1000/-
10	Not Wearing Seat belt while driving	2500/-
11	Driving without license or Registration or PUC Certificate of any vehicle including crane, hydra or any such heavy vehicle	1500/-
12	Vehicle without reverse horn including crane, hydra or any such heavy vehicle	1500/-
13	Head light / tail light and side indicator failed of any vehicle, including crane, hydra or any such heavy vehicle	1000/-
14	Wrong parking / wrong side driving	250/-
15	Using mobile phone during driving	1000/-
16	Poor visibility of registration No. / Without registration No.	100/-
17	Broken / without side view mirror	100/-
18	Over taking above speed limit	1500/-
19	Broken / without pressure gauge on Oxygen / LPG / Acetylene cylinders	1500/-
20	Without flash back arrester on Acetylene & Oxygen cylinders for project site	2500/-
21	Spillage of material (dripping)	500/-
22	Electrical equipment without Earthing / ELCB / Double insulation cable	5000/-
23	Lifting Tools & Tackles used without/ test certificates	10000/-
24	Working without valid work permit or not complying with conditions of work permit	5000/-
25	Putting to use cranes, hydra or any other vehicles for material movement or earth mover without valid test certificates and licence and registration	10000/-
26	Excavation without solid barricading	2500/-
27	Housekeeping repeatedly not maintained	
	• First Time	Warning
	• Second Time	1000/-
	• Third Time	5000/-

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9	Driving beyond speed limit	1000/-
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17	Broken / without side view mirror	100/-
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26	Excavation without solid barricading	2500/-
27	Housekeeping repeatedly not maintained	
	• First Time	Warning
	• Second Time	1000/-
	• Third Time	5000/-

IGESL SITE HEALTH SAFETY & ENVIRONMENT MANUAL	WTG OPERATIONAL SAFETY GUIDELINE	Guideline No IGESLSITE/HSE/025
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1. OBJECTIVE

The objective of this guideline is to establish standards and procedures by which the installation and operation will be systemized. It will also help to increase the effectiveness and efficient use of WTG's, keeping in view the basic safety concern which drive to protect from bodily injury, casualties, material or environmental damage. In addition, this WTG operational safety guideline provides a permitting process to ensure compliance with the provision of the requirements and standards established by this guideline.

2. SCOPE

This Policy is applicable to all IGESL/IWL/RESCO employees, Contractors and Sub-Contractors of IGESL / IWL/ RESCO from O&M and Infrastructure department, including all external agencies that will be present at site.

3. GUIDELINE

- a. All operations and maintenance of WTG shall be in accordance of the WTG OPERATIONAL SAFETY MANUAL (Ref: DOCUMENT NO – WRES/IWL/CUS/026).
- b. The Above Manual is attached to this guideline as **Annexure 25.1**

4. POWER TO AMEND:

- a. Any change of the guideline shall have to be approved by the Corporate Quality.
- b. The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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WTG'S OPERATIONAL SAFETY MANUAL

WIND TURBINE GENERATOR (WTG)

Date of Release

01.04.2022

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100. GENERAL

This document contains the operational safety manual of the WTG and is PROPRIETARY information for use pursuant to the terms of the applicable INOX Agreement.

Unless there are provisions to the contrary in the component supply contract, all the statements made herein apply without reservation. Should requirements for individual items in this specification differ, the remaining content shall remain unaffected and continue to apply without reservation.

The latest versions of standards, rules and regulations, and the state of the art must always be taken into consideration when carrying out any work. Should more than one standard, rule or regulation apply to a case, the strictest interpretation must always be observed for completing the work.

100.1 Other Applicable Documents:

Further documents apply in combination with this manual.

When handling the WTG you have to adhere to all instructions provided in this operational safety manual.

100.2 Storage of Documents:

Keep this manual in the file with the other documentation for the WTG to be able to refer to it when necessary.

If the WTG is transferred to a different owner or operator, the manual has to be transferred as well.

The operational safety instructions must always be available to the personnel working in the WTG.

100.3 Used Symbols and Mark-ups:

In this document different symbols and mark-ups are used. The symbols and mark-ups used in the manual are explained below.

These symbols used for warnings have also to be regarded (→ section 101 Safety Instructions).

- Symbol for a listing in descriptive text

1. Numeration in descriptive text

- (1) Numbered directions in instructive text

- Symbol for a necessary task and instruction

Display text marks text found on a display

(→ section/fig./tab./p.) = cross reference to a section, a figure, a table or a page



Symbol for additional information or useful hint.

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101. SAFETY INSTRUCTIONS:

This section contains information for your safety to avoid bodily injury, casualties, material and/or environmental damage.

Observe the following basic safety instructions and warnings which precede the description of a possibly dangerous action.

101.1 Categorization of Warnings:

Warnings are preceded by warning symbols and signal words, descending in regard to possible hazard severity. An explanation of the hazard levels can be found in Table 0–1.

Table 0–1: Categorization of warnings

Warning symbol	Signal word	Meaning
	DANGER	Indicates a hazardous situation which, if safety measures are not observed, will result in death or serious injury.
	DANGER	Indicates a hazardous situation due to electric shock which, if safety measures are not observed, will result in death or serious injury.
	CAUTION	Indicates a possibly hazardous situation which, if safety measures are not observed, can result in injury or damages.

101.2 STRUCTURE OF SAFETY INSTRUCTIONS:

Warnings are marked with an upper and a lower division line. They are generally structured as follows:

SIGNAL WORD!



Type and source of hazard!

Explanation regarding type and source of hazard.

- Procedures or instructions to avoid the hazard.

101.3 INTENDED USE:

The wind energy converter, hereafter referred to as WTG, is used to convert wind energy into electrical energy as well as to feed the electrical energy into the network of the electricity supplier according to the technical requirements. The WTG is only to be used as intended and within the capacity limits. Any other or additional use is considered to be improper. Inox Wind Limited will not be held liable for claims resulting from improper use. The operator alone bears the risk.

The WTGs from Inox Wind Limited have been designed using state-of-the-art technology in accordance with recognized safety regulations. Nevertheless, there is still a risk of injury or death to the user or others or of damage of the WTG and other property in the event of improper use or use for which it is not intended. For damages due to use other as intended and due to neglected safety instructions Inox Wind Limited will not be held liable.

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To avoid hazards the WTG may only be operated:

- In safety-related faultless condition (Faults which can affect safety have to be remedied immediately)
- In adherence to all related documentation.
- While observing and following all maintenance intervals.

101.4 WORKSHOP ASSEMBLY, ERECTION AND COMMISSIONING:

Assembly and commissioning is only allowed according to the assembly and commissioning documents and after an instruction by Inox Wind Limited personnel. Warranty is not valid in the case where protocols have not been followed. A failure to follow the protocols may also result in a refusal to give site support.

Every turbine shall contain a logbook indicating all operations conducted on the turbine, all maintenance activities, all faults and all filled out protocols.

101.5 OPERATION CONDITIONS:

For the WTG the operation conditions stated in the respective operating instructions document apply.

The WTG has to be maintained in regular intervals according to the maintenance documentation to keep a safe and proper state at all times. Faults that can reduce safety must be rectified immediately.

Observe the documents listed in the reference list at the beginning of this document.



- An isolated operation is not acceptable
- Structural changes to the WTG without written approval of the developer are prohibited
- Interference and changes to the control software is prohibited
- The use of insufficiently qualified personnel is prohibited

Only the operator is liable for damage caused by improper use

101.6 ESSENTIAL CONDITION OF THE WTG WITHOUT POWER SUPPLY:

Regarding the time period between erection of the turbine and grid allocation or for longer breakdown of the grid, a safe condition of the WTG has to be established.

A safe condition is established by ensuring the following points:

- All three blades have to be in feathering position (idling position).
- Released rotor lock and
- Released mechanical brake to allow a free turning of the rotor (passive brakes have to be locked in the released position mechanically).
- The nacelle has to be turned into the main wind direction if an external power supply is available.

This applies for gearboxes with and without mechanical lubrication pumps.

For gearboxes without mechanical lubrication pump, ensure that the oil level is on the oil level indicators maximum.

101.7 REQUIREMENT FOR PERSONNEL:

A minimum of two persons have to be present when the WTG is entered. Only trained personnel may enter the WTG. The applicable health, work safety, accident prevention, fire protection and environmental regulations must be observed when working on the WTG. Personnel working on the WTG must be familiar with these regulations.

101.7.1 Operator:

The operator is a person who is legally allowed to use the WTG as intended. The operator is responsible for the proper operation of the WTG.

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The operator has to

- have read and understood the operating manual
- be of legal age
- instruct maintenance personnel to carry out regular maintenance

101.7.2 Authorized Qualified Personnel

Authorized qualified personnel can assess the work assigned to them and can recognize possible dangers based on their technical training, knowledge and experiences as well as their knowledge of the relevant regulations.

There are the following types of specialists, who are allowed to carry out different tasks:

- Instructed persons with qualifications as specialists, e.g. mechanic
- Instructed electrical specialists
- Trained specialists with additional qualifications in hydraulic engineering

All work on the WTG is only to be carried out by authorized and qualified personnel. Table 0–2 shows the proficiency of a person and the tasks which this person may execute.

Table 0–2: Overview of the minimum personnel qualifications required

Activities	Instructed persons with qualifications as specialists*, e.g. mechanic	Instructed electrical specialists*	Trained specialists*with additional qualifications in hydraulic engineering
<i>Mounting and erection</i>	<i>INOX or appropriate personnel only</i>		
<i>Commissioning and test run</i>	<i>INOX or appropriate personnel only</i>		
<i>Activation, operation, shut down</i>	•		
<i>Mechanical work: trouble shooting, repair work and maintenance</i>	•		
<i>Work on the electrical system: trouble shooting, repair work and maintenance</i>		•	
<i>Work on the hydraulic system: trouble shooting, repair work and maintenance</i>			•
<i>Dismantling</i>	<i>INOX or appropriate personnel only</i>		
<i>Disposal</i>	•		

Personnel must be instructed by the manufacturer and be informed about:

- Possible dangers, their consequences and their prevention
- The safeguarding of the WTG in the event of danger
- The use of personal protective equipment (PPE)
- The safety equipment
- The observance of operational requirements
- The correct use of tools for the required purpose

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Every person working on the WTG must:

- Have completed first aid training
- Be healthy and physically fit enough to ascent the tower; persons between 25 and 50 years of age must undergo work medical checkups every three years, persons over 50 years of age each year
- Have attended safety training for working on WTGs. This training must contain instructions for working at heights, for rescuing an injured colleague in the different parts of the WTG (Tower, nacelle and hub) and for the use of PPE required for these activities.



Personnel working on the WTG must have a good command of the English language and be able to understand the processes and descriptions given in the overall documentation!

101.8 PERSONAL PROTECTIVE EQUIPMENT (PPE):

Operators must use PPE when climbing the tower. They also have to be equipped with first aid kits and communication devices.

PPE for site activities must contain:

- ❖ A climbing equipment set including:
 - A full body harness with chest ring, waist strap with D-ring, rear attachment ring.
 - A shock absorber.
 - A positioning lanyard.
 - An anchor sling.
 - At least two carabiners.
 - A head lamp.
- ❖ A helmet for work at height, with locking chin strap and center fit adjustment.
- ❖ Protective clothing for protection against injuries and fluid contamination.
- ❖ Protective gloves for protection against injuries and fluid contamination.
- Protective shoes equivalent to S3 level.
- Hearing protection.
- Thermal or cooling equipment for extreme climate conditions.

All this equipment must comply with the local regulation. (Example: ANSI in USA).

When working in the tower base and around the WTG you have to wear a helmet and protective shoes at all times.

When working in a workshop, personnel must be equipped with standard PPE (helmet, work clothes, safety shoes). Safety glasses and earring protection shall be used when required.

- Perform a visual inspection and a functional check of the PPE before each use.
- Every work conducted at heights above 1.8 meters, where the use of personal fall protection equipment is not possible, shall be made safe by the use of a guard system.
- Ensure that the annual audits of the PPE are carried out by an expert.

- The ladder, rail or rope system as well as the runner must contain a proof of regular checking and be in good condition. Always perform a function test by leaning back before climbing.

101.9 SAFETY SYMBOLS AND SIGNS ON THE WTG:

The following symbols shall be attached to the tower base of the WTG (see **Error! Reference source not found.**). These symbols must be checked regularly and replaced when they become illegible.

Safety symbols and signs on the WTG:

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Safety symbols / signs	Description	Location
	Electrical current hazard!	At the switch cabinet, at the pitch switch cabinet and at the choke cover
	Wear safety helmet!	On the sign in the tower base
	Use ear protection!	On the sign in the tower base
	Wear protective clothing!	On the sign in the tower base
	Wear protective gloves!	On the sign in the tower base
	Use safety belt!	On the sign in the tower base
	Wear protective shoes!	On the sign in the tower base
	Naked flames prohibited!	On the sign in the tower base
	No smoking!	On the sign in the tower base
	Emergency exit	Junction between nacelle and tower
	Danger warning	Junction between nacelle and hub
	Rotating parts!	At the rotor lock
	Keep hands clear!	At the rotor lock
	Falling Danger	Exit to the roof at the front part of the nacelle and exit to the roof at the rear part of the nacelle
WARNING  Charged Ultracaps	Electrical Hazard	Equipment with long discharge time

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101.10 WARNING SIGNS:

Place a fall hazard warning sign on the roof exit.



101.10.2 Place a warning sign at the emergency exit.



101.10.3 Place a risk of injury warning sign on the gearbox and an information sign with “only set the rotor lock when the brake was applied”



101.11 RESIDUAL RISKS AND SAFETY MEASURES:

In the following the residual risks and safety measures to avoid them are described.

101.11.1 Mechanical Hazards:

The following moving parts present a danger of personal injury caused by being drawn in or crushed (see Figure 0–1):

- Rotor connection to the gearbox
- Gearbox shaft
- Coupling-brake unit
- Pitch drives of the rotor blades
- Yaw system drives
- Rotor lock
- Slip ring

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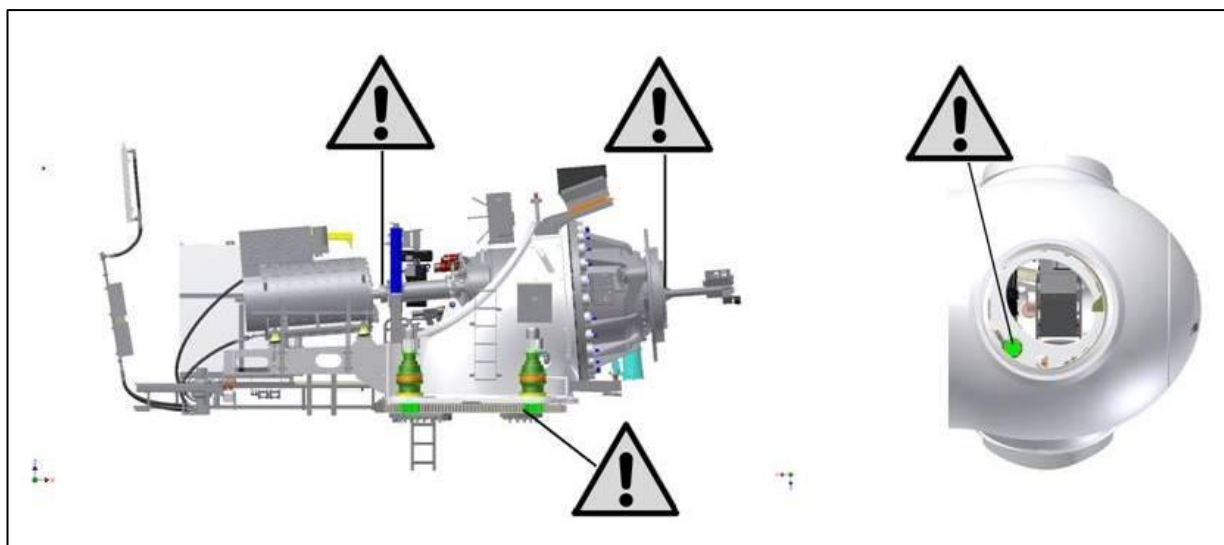


Figure 0–1: Example of a nacelle without GRP cover

- Stop the WTG and put it into Service Mode state before climbing the tower.
- When working in the nacelle next to the hub, always have the hub manholes covers closed.
- Keep loose clothing and hair tied back.
- Do not wear jewellery.

101.11.1.1 Falling Hazard

There is a falling hazard when climbing inside the tower. In the nacelle there is a door through which tools can be transported. There is a danger of falling out of the nacelle when the door is open.

- Keep the tower platform hatches and the door closed and open it for transport purposes only.
- Use your PPE to secure yourself against falling.

101.11.1.2 Danger of Falling Objects inside and outside the WTG

There is a danger of falling objects when working inside and outside the tower. There is also a risk of being crushed by falling load if lifting equipment fails during lifting.

- Do not dismount or lower the blade without removing tools from the hub.
- Keep all doors and hatches closed and open them for transport purposes only.
- Surroundings of the WTG must be cleared if someone is working outside the tower, nacelle or hub.
- Keep onlookers away.
- Always wear your helmet inside and outside the tower. It is also mandatory to wear your helmet in the hub because of sharp edges.

101.11.1.3 Danger when Working Under or Next to Suspended Loads

Personnel must always follow overhead work safety instructions to minimize the risk of injury from falling objects. Do not perform overhead work under any circumstances in places where people or vehicles are present or where they may enter during the course of the work.

- Never stand under a suspended load.
- Do not access the zone of danger.
- Secure the zone of danger with warning signs and a red/white barrier tape.
- Only use lifting equipment designed for the task.
- Check lifting equipment visually for damage prior usage.
- Use guiding ropes when situations are endangered by the rotation or uncontrolled motion of load.

The radius of the zone of danger depends on the height of the falling object (see Table 0–3).

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Table 0–3: Dangerous area of falling objects

Height of the object h [m]	Radius of the danger area	Minimum safety radius [m]
< 100	$h / 5$	12,5
>100	$h / 6$	20,0

101.11.2 Electrical Hazards (EN50110:2008 / EN8001-1/A4)

The voltage required for the operation of the system can be fatal if getting in contact with live parts. For this reason it is not allowed to perform the work when voltage is present. In case of a short circuit there is a danger of spark discharge and fire.

When opening the cabinet there is a risk of electrical arcs. Touching live parts can lead to fatal electric shocks. Before opening the cabinet and before working with any electrical components, the WTG must be in a voltage-free state and the components have to be checked to verify that they are dead. The connection of the system must be sufficient to prevent overload.

Cabinet doors shall always remain closed during or when starting operation. Only trained personal is allowed to make measurements during operation. Use of appropriate PPE is mandatory.

101.11.2.1 Safety Rules:

Always observe the following five safety rules in the specified order to ensure that a voltage-free state has been achieved. Always inform colleagues about your actions prior to start of work.

- (1) Disconnect completely;
 - Make sure that the part, on which work is to be carried out, is disconnected from all sources of supply.
- (2) Secure against unexpected re-connection;
 - All switching devices that have been used to disconnect the electrical installations for the work activity must be secured against re-connection preferably by locking the operating mechanism.
 - Parts of the electrical installation still remain charged after complete disconnection of the electrical installation, e.g. capacitors and cables. They shall be discharged using suitable devices.
- (3) Verify that the installation is dead;
 - Always check the voltage on all poles (on each individual conductor).
 - Verify that the supply has definitely been isolated with a voltage detector.
- (4) Carry out grounding and short-circuiting;
 - Ground the system first and short-circuit it afterwards.
- (5) Provide protection against adjacent live parts;

101.11.2.2 Additional Requirements:

- Keep the electrical system in a safe condition.
- Faults, e.g. loose connections etc., must be reported and rectified immediately.
- Cover all the live WTG parts that could pose a risk to you during work.
- Label the danger areas clearly and adequately.
- Switch off the WTG immediately if there is any fault on the power supply.
- Use only original fuses with the prescribed current.
- Keep the switch cabinet as well as all terminal and connection boxes closed at all times.
- Restrict the access to the electrical unit for maintenance and service to authorized personnel.
- Protect the live parts of the electrical unit against direct contact by means of insulation, positioning, arrangement or attached equipment. The protection measures depend on voltage, frequency, application type and operating location of the live parts.

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- Protect the electrical unit – according to its frequency, application type and operating location – against indirect contact in such a way that even when there is a fault in the electrical unit there is protection against hazardous voltages.
- Insulate auxiliary devices and tools and check for defects before each use.
- For further information see EN 50110:2008.

101.11.2.3 Power Cap Cabinet

- Only qualified personnel may test the cabinet. In this context qualified personnel means people who are trained to handle the occurring voltages (up to 400 VAC and up to 600VDC) and currents, and are familiar with the operating instructions, especially with the warnings!
- Before connecting or disconnecting the test cables make sure that the Power Cap cabinet is discharged! Mean time before discharge is around 8 minutes. Before that time has not passed, the system is not safe. This indication of time is here as information and can strongly vary according to the system used. We strongly advise to follow the manufacturer's requirement on that.
- Before connecting or disconnecting the test cables, switch off the main switch at the cabinet and disconnect it from the power!
- Whenever connecting or disconnecting the CAN-Communication interface at the Pitch converter, disconnect the power supply for the relevant cabinet!
- The PC-Cabinet surface becomes hot during the power caps charging procedure (only via PLC) and during the power caps discharging procedure (via manual discharging switch).



Ensure that everybody keeps clear of the danger area!

101.11.3 Hazardous Materials

The Material Safety Data Sheets (MSDS) of the materials must be delivered to the customer. The customer bears the responsibility to have the correct MSDS on site.

101.11.3.1 Oils and Lubricants:

When working with oil and lubricants, the rules below must be followed to avoid problems.

- Use suitable protective equipment.
- Do not inhale mist or vapour – especially hot oil creates large amounts of vapour.
- Avoid contamination of clothes.
- Wear eye or face protection.
- Wear suitable gloves.
- Avoid spilling.

Do not throw oil contaminated objects in the normal trash; store them in labelled waste containers.

101.11.3.2 Coolants:

When working with cooling systems, the coolants may be very hot and under high pressure. It is therefore important to follow the rules below to avoid health problems.

- Wear eye or face protection where splashing is likely.
- Wear suitable gloves.

101.11.4 Danger of Pressurized Hydraulic Oil

101.11.4.1 Dangers of Pressurized Systems

Excess pressure exerts extreme loads on pressure-carrying parts. This can cause the hyd. system to burst.

- Observe the maximum operating pressure of the hydraulic system.
- Switch off the hydraulic aggregate before starting to work on the hydraulic system.
- Depressurize the system.
- Do not obstruct the flow of cool air into the hydraulic aggregate.
- Always keeps the cooling unit clean to ensure optimum cooling.
- Do not use supply and exhaust air surfaces as storage spaces.

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101.11.4.2 Danger of Hydraulic Liquids

Hyd. fluid is a chemical product which can lead to allergic reactions in the case of prolonged contact with the skin. Contact with the eyes can lead to blindness. Hyd. oil can reach temperatures of approx. 90°C when the system is in operation. Leaking hyd. oil causes great environmental damage and is a slipping hazard.

- Let the hot fluids cool down sufficiently before beginning maintenance, inspection and repair work.
- Observe the hydraulic fluid manufacturers safety data sheets.
- Avoid skin contact.
- Wear suitable protective clothing and gloves.

101.11.5 Residual Energies:

101.11.5.1 Dangers of Residual Energies

After switching off the WTG or single systems the following residual energies remain:

- Chemical energy (accumulators)
- Energy of rotating parts (nacelle, rotor blades, drive train)
- Electrical charging (capacitors)

- Account for residual energies

101.11.6 Thermal Hazards:

101.11.6.1 Dangers from Hot Surfaces:

During operation or directly after shut down the surfaces of some components, they can reach temperatures above 60°C. The following components can be hot:

- Coils of restrictors
- Power semiconductors of converter
- Coils of transformers, motors and generator
- Transmission oil (Super Gear)
- Oil unit (Super Gear)
- Fast moving bearings
- Brake disc
- Heaters of cabinets
- Cooling liquid
- Metallic oil pipes
- Electrically controlled valves in the oil circuit
- Vacuum valve coils of the hydraulic aggregates
- Cables between transformer and converter and between transformer and generator
- Heat exchangers of cabinets
- Gearbox oil tank (when separated from gearbox)
- Generator
- Yaw and pitch gearboxes
- Heated anemometer
- Converter cooling unit
- Do not touch hot surface

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101.12 SAFETY EQUIPMENT:

The WTG is equipped with the following safety devices (see Figure 0–2). Further explanation of these devices can be found in

Table 0–4.



Figure 0–2: Safety devices in a WTG

101.12.1 Safety Chain:

The safety chain is structured as a hardware chain. The safety chain is monitored by the PLC; it detects which part of the safety chain has been triggered.

- Emergency stop button in the nacelle (one on each side of the gear box and one at the nacelle cabinet)
- Emergency stop button at the tower base (at the cabinet)
- Over speed control switch (for rotational speed)
- Vibration sensor (on the main frame)
- Working position switch at the pitch (pitch angle <-3°)
- Brake signal
- Twist protection

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- The safety chain stop can only be reset manually.

Table 0–4: Safety devices of a WTG and their functions

Position	Safety equipment	Number	Function
27	Blocking bolt	1	Fixes the crane
28	Emergency stop button at the operating unit of the crane	1	Stops the crane immediately and switches current off
29	Emergency stop switch	4	Stops the WTG and switches current off
30	Protective cover	1	Prevents access to the gear rim of the yaw system
31	Protective cover	1	Prevents access to the brake-coupling unit
32	Rotor Lock	1-2	Locks the rotor in position for entering the hub
33	Platform with separating skirting and hatches	2-3	Protects personnel standing at the bottom from falling objects
34	catching device	2	Protects climbing personnel from falling
No Figure	Emergency descending aid	1	Enables escape from the nacelle in an emergency situation

101.12.2 Emergency Shut-down:

Press one of the emergency stop buttons in dangerous situations. There are four emergency stop buttons:

- at the tower base cabinet
- at the left side of the gearbox
- at the right side of the gearbox
- at the nacelle cabinet

The emergency stop button can only be reset by pressing the reset emergency button. The function of the emergency stop buttons has to be tested during maintenance work.



As long the emergency stop button is not reset, the WTG is not able to restart automatically. Regardless of the WTG's state all voltages are still present.

101.12.3 Additional Freewheel-System:

The motors of the pitch system are equipped with a mechanical brake with a free wheel system, which is a pure mechanical and hence robust system that allows the blades to move into feathering position in case of a pitch converter failure.

The freewheel-system exploits the fact that the used blades have the tendency to turn into feathering position. To avoid movement into working position direction a mechanical freewheel is used (Diode effect).

The system consists of a brake/freewheel combination and a contactor to switch the motor connections to “damping” resistors (which define an M/n characteristic) to prevent overspeed of the pitch drive.

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Also in safety run with backup energy the freewheel system supports the drive by inhibiting movement into working position.

Attention!

Accidents due to unexpected movement of the blades might occur!

In case the hub cabinets are without power supply or the service box gets removed, blades can always move back into feathering position due to the free wheel system.

- During rotor assembly wooden cones have to be inserted between the pitch pinion and the pitch rim to prevent the blades from turning if the power of the generator is lost.
- When entering/working in the hub, the blades have to be in feathering position.
- When turning the blades while remaining in the hub, the blade locking device has to be installed.
- Before removing the service box, the blade has to be turned back in feathering position.



101.13 ROTOR LOCK:

In order to carry out commissioning, repair and maintenance work in the area of the rotor and inside hub, the rotor has to be fixed in place by the rotor lock. The rotor lock is used as a locking system for the whole transmission. Once work has been completed, release the rotor lock immediately.

In addition to the rotor lock, apply the mechanical brake when working in the interior of the hub. It is not allowed to enter the hub when the rotor is only stopped by the mechanical brake, even if the wind speed is below the limit v_{T3} for the rotor brake applied state (see chapter 0). Always check the indicators on the control cabinet (NC) in the nacelle to see whether the hub may be accessed or not.

101.13.1 Rotor Lock Safety Instructions:

- Only trained personnel may set/release the rotor lock
- Always check the indicators on the nacelle control cabinet to see whether the hub may be accessed or not.
- In addition to the rotor lock apply the mechanical brake before entering the hub.
- Once work has been completed, the rotor lock has to be released again to ensure that the WTG is in a safe condition (see paragraph 0).

101.13.2 Operating the Rotor Lock:

Before setting the rotor lock, ensure that the entrances to the hub (manholes) are in the wanted position.

While setting and releasing the rotor lock it has to be ensured that no rotation of the rotor occurs. During these procedures the rotor is fixed solely by the mechanical brake. Therefore the wind speed limit v_{T3} for the rotor broken state must not be exceeded (see chapter 0).

When the rotor lock is set, the wind speed limits v_{T1} and v_{T2} are valid depending on the pitch angle and the yaw error (see chapter 0).

101.13.3 Maintenance Work on the Rotor Lock:

While doing maintenance work on the rotor lock it has to be ensured that no rotation of the rotor occurs. During this procedure the rotor is fixed solely by the mechanical brake. Therefore the wind speed limit v_{T3} for the rotor brake application state must not be exceeded (see chapter 0).

101.13.4 Wind Speed Limits:

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Commissioning, repair and maintenance work is only permissible under certain wind conditions, which are stated in Table 0–5. Before starting the work it must be ensured that wind speeds are not expected to exceed the permissible limits during the time required, for instance by obtaining a reliable weather forecast for the turbine site.

Table 0–5: Wind speed limits for rotor lock operations

	Situation	Additional condition	10 min mean wind-speed v_T [m/s] at hub height
Rotor locked state	• Rotor locked • Yaw working • Collective pitch angle	1. Rotor lock is already set 2. Yaw is working normally in automatic mode 3. All blades can be moved together between minimum and maximum blade position (feathering- and working position)	
	• Rotor locked • Yaw working • Individual pitch angle	1. Rotor lock is already set 2. Yaw is working normally in automatic mode 3. A single blade can be driven manually between minimum and maximum blade position, while the two other blades have to be in feathering position	$\leq v_{T1}$
	• Rotor locked • Yaw working or not working • Blades are in feathering position	1. Rotor lock is already set 2. Yaw is not working or working 3. All blades have to be in feathering position	$\leq v_{T2}$
Rotor braked state	• Rotor braked • Yaw working	1. Rotor is solely kept in position by rotor brake (no rotor lock is set) 2. Yaw is working normally in automatic mode 3. All blades have to be in feathering position	$\leq v_{T3}$
	• Rotor braked • Yaw not working	1. Rotor is solely kept in position by rotor brake (no rotor lock is set) 2. All blades have to be in feathering position 3. Hub must be turned in wind direction by auxiliary power supply	$\leq v_{T3}$
		Wind speed limits[m/s]	
Power class		v_{T1}	v_{T2}
		v_{T3}	
1.5MW		11	18
1.65MW		11	18
2MW		8	18
2.5MW		11	18
3MW V1		11	18
3MW V10		11	18
5MW		12	18

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The wind speeds are 10 minutes means at hub height. If a limit is exceeded, stop the working immediately. When the speed falls below the limit again, wait at least 15 minutes during which the wind speed must remain within the permissible range. Then the work can be started again.

In case the limit V_{T2} is exceeded, the rotor lock has to be released.

101.13.5 Safety Guidelines for the Inside Inspection of the Blades:

All the blades must be in the feathering position. The blade which should be inspected has to be in 3 o'clock position. (3 o'clock position means horizontal right position by facing the rotor from the wind direction. Not the view from the nacelle.) In this hub position, the blade (which is in feathering position) will be retained by the pitch stop. In addition the blade locking device has to be mounted. Take care that after maintenance work the blade locking device is removed.

101.13.6 Procedure for the Manual Blade Locking:

- Only trained personnel may set the blade locking device (see Figure 0–3) for the pitch system.
- Set the locking device over the end of the T-bolts (blade bolts) and align the mouthing holes for the M16 to the casted hub by turning the designated blade using the service box.
- Check that 2 T-bolts are locked by the locking device. M16 bolts are torqued by electric impact wrench.



Figure 0–3: Example of an installed blade locking device

101.14 WEATHER CONDITIONS:

Work on the WTG is only allowed to be carried out in the range of permissible wind/weather conditions. Before starting any work, a reliable weather forecast must therefore be obtained.

- Climbing the turbine as well as work in the nacelle or in the hub may only be started if the wind speeds are not expected to exceed the permissible limits (given in Table 0–5) during the time required for working on the WTG.

Attention!



Climbing as well as working inside of a WTG is only permitted below v_{T2} according to Table 0–5.

- The entire personnel must leave the WTG area as quickly as possible when bad weather sets in – with or without thunderstorm, or if the maximum allowed wind speed (v_{T2} according to Table 0–5) is exceeded! The turbine without power supply has to be left in a proper state (see chapter 0).

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101.14.1 Working at Low Temperatures:

All work at the turbine site (WTG erection/maintenance) has to be executed above -20°C. Below -20°C, tools, materials and personnel are affected in a way that properness of the work can't be granted and forces, tolerances and material properties are influenced in such a way that the required state can't be ensured.

101.14.2 Special Considerations for Tools:

All tools can be used until -20°C, unless special requirements are given by the supplier or unless they are stated below.

Hydraulic Torquing / tensioning tools

All hydraulic torquing / tensioning tools have to be stored in a tempered environment, preferably at room temperature. The hydraulic tensioning cylinder and the Hytorc are usable until -30°C according to the information of the supplier. Nevertheless, the hydraulic unit is crucial for a correct operation. The viscosity of the oil will change severely when the oil temperature lowers down below -15°C, hence it must be ensured to store it in a tempered environment, preferably at room temperature, until short time before its use. During operation the oil is not cooling down due to the pumping process. After the use it must be returned to the above defined storage environment.

101.15 BEHAVIOR IN AN EMERGENCY:

The WTG may only be entered in teams of at least two persons, to be able to carry out the following emergency procedure:

- (1) Switch the WTG off by pressing or activating the emergency stop button.
- (2) Secure the WTG against restart.
- (3) Protect injured persons.
- (4) Alert the medical and fire fighting services if required.
- (5) Determine extend and type of the emergency situation
- (6) Rectify the cause.
- (7) Restart the WTG only if the cause has been rectified. After the emergency unlock the emergency stop button by turning it anti-clockwise.

101.15.1 Behavior in Accidents with Bodily Injury:

Carry out the following emergency procedures after an accident:

- (1) Shut down the WTG immediately by pressing or activating the emergency stop button.
- (2) Perform emergency aid/first aid.
- (3) Observe the rescue plan at the site.
- (4) Alert colleagues at the site and start rescue procedures with rescue equipment if required.
- (5) Protect the injured person and put him into a stable position.
- (6) Speak to the injured person calmly.
- (7) Make an emergency call using a telephone or radio: fire brigade, rescue services (doctor).
 - ❖ Give brief and exact details about:
 - Your telephone number
 - Your name
 - Sequence of events of the emergency situation
 - Location of accident
 - Number of injured persons
 - Type of injuries
 - Precise indication of location

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❖ Ensure the call is finished by the rescue service!

(8) Do not attempt to move the injured person yourself, except if height rescue is needed.

(9) Inform the company management and the EHS department.

(10) Keep access clear

Carry out the following additional procedures after accidents with electrical shocks:

- ❖ Switch off the current and voltage of the WTG immediately. If this is not possible, ensure that you are standing on dry ground and separate the accident victim from the source of current with a non conducting object (e.g. wooden stick)
- ❖ Protect yourself and rescue the injured person from the danger area!
- ❖ Inform a doctor and have an EEG (electrocardiogram) performed if required.

101.15.2 Behavior in a Fire:

Flammable materials such as oils or GRP (glass reinforced plastic) are used in the WTG. In addition there is a risk of fire associated to the electrical equipments of the WTG. Follow the rules below to minimize risks.

- When work causing sparks is carried out (welding, grinding) these materials have to be protected against direct contact.
- Minimize the use of flammable liquids.
- Use the fire extinguisher to create a safe passage to go out of the WTG. Do not consider the fire extinguisher as a mean to save the WTG from burning. Their primary use is to allow operators for a safe evacuation.
- WTG's extinguishers shall be CO2 extinguishers. A fire extinguisher shall be available in the tower base and another one in the nacelle. They must be in good working state and regularly checked. Operators trained regarding fire fighting must take lead and supervise in case of fire.

In case of fire, follow these instructions

- Stop the WTG (emergency stop button)
- Alert the fire brigade without delay
- Leave the tower via the emergency exit (must be marked with a sign).
- Descend from the nacelle using the rope-down devices outside the tower.
- Get to a safe distance away from the WTG (if the nacelle, rotor or upper parts of the tower are burning, there is a danger of falling burning parts).

101.15.3 Behavior in Strong Wind, Storm, Sandstorm and Earthquakes:

Work on the WTG may only be carried out in the range of permissible wind conditions. Work may only be started if the wind speeds are not expected to exceed the permissible limits during the time required.

The WTG is not allowed to be accessed during storm and thunderstorm or when a storm or thunderstorm is gathering. Note that site locations can determine weather conditions. For example, special gusts of wind can arise in mountainous areas.

- Obtain a reliable weather forecast before starting any work.
- Climb down the WTG and exit immediately if a storm, thunderstorm or earthquake starts while you are in the tower or nacelle.
- If the WTG has been struck by a lightning, and visible damage is found, the power supply must be disconnected.
- Observe the limits for permissible wind conditions (see table 0).

101.16 CLIMBING THE TOWER:

101.16.1 Personnel Requirements:

Persons climbing the tower must:

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- Be healthy and physically fit enough to ascend the tower; persons between 25 and 50 years of age must undergo work medical checkups every three years, persons over 50 years of age every year.
- Have attended a first aid training course.
- Have attended safety training for working on WTGs. This training must contain instructions for working at heights, for rescuing an injured colleague in the different parts of the WTG (Tower, nacelle and hub) and for the use of PPE required for these activities.

The tower must not be climbed by persons who are disabled or sick or who are suffering from acrophobia or claustrophobia.

101.16.2 Climbing the Tower:



Operators must be trained regarding the risks of climbing the tower. AMSC can assist you to get in contact with suitable training providers.

Observe the following points for a safe climbing:

- Always consider the weather conditions before climbing the tower (see chapter 0)
- A minimum of two trained operators must be working in the same WTG. It is forbidden to be alone on-site.
- Shut down the WTG and secure it against restart before climbing the tower. The WTG must not be allowed to go back to operation mode when operators are climbing the tower.
- Always wear your head lamp when climbing the tower.
- When climbing the tower, wear PPE for working at heights.
- Make sure the runner (fall arrester) fits to the rail or rope of the ladder.
- Keep a minimum safe distance of 5 m between operators when climbing.
- Keep away from the ladder area when staying in the tower base.
- When climbing up the tower, only the last climber is allowed to carry tools attached.
- When going down the tower, only the first climber is allowed to carry tool attached.
- Always close the hatches of all tower platforms after they have been passed.

To climb the tower safely, all grips, steps, hand railings, rest platforms and ladders must be kept free of dirt, ice and lubricants. Always make sure that you are secured against falling with a fall arrester or a shock absorber. A positioning lanyard is not a device securing against falls.

(1) Fasten the carabiner of the fall arrester (34) on the harness chest ring (see Figure 0–4). Always perform a functional test by leaning back before climbing.



Figure 0–4: Example of a fall arrester (slider/runner)

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- (2) Climb the tower using the ladder. Rest platforms are installed between climbing sections.
- (3) In order to reach the platforms open hatch and close it after entering.
- (4) When reaching the last hatch, secure yourself with your shock absorber. If reachable without disconnecting the runner, close the hatch. If this action is not possible, disconnect your runner and close the hatch, you are secured by your shock absorber.

101.16.3 Using the Service Elevator:



The type of service elevator depends on the model and height of the tower. Due to that it is essential to read the respective crane manual first!

- Wear your personal safety equipment when using the service elevator.
- Observe the maximum load and the operating manual of the service elevator.

101.16.4 Rescue of an Injured Person from the Nacelle or from the Ladder:

Any operator suffering a shock and needing help can be rescued using the rescue device. The rescue device has to be carried along when working in a WTG and has to be placed on the top platform of the tower. Operators are not allowed to work alone in the WTG.

- Observe the manual for the emergency descend equipment.
- Observe the instructions received during rescue training.
- If possible, a third person should help and support the injured person when he reaches the ground.

101.16.4.1 Rescue Instructions for Positioning the Injured Person:

When a person is hanging in a harness, the blood flows to the legs and part of it remains there. The instinctive body reflex will be to shut down until the blood circulation goes back to normal. Due to that, the casualty will turn unconscious after 5 to 15 minutes depending on the physical condition of the persons. This natural reflex from the human body responding to a situation where the body is hanging in an upright position is called suspension trauma.

Once the person is unconscious, you have 10 to 25 minutes to rescue him before the brain dies of lack of oxygen. This time is indicative and highly depends on the person's physical condition, age and the position in which he is lying. In addition, this time changes for the same person from one day to another. Therefore the main rule is to rescue as fast as possible.

There are two countermeasures that the casualty, if conscious, should do without delay.

1. Sitting-up: Try to put yourself in a sitting position using your lanyard or a Prusik knot. This will make your blood circulation better.
2. The bicycle technique: Pedalling in midair can help but his also dangerous as you are using energy and therefore raising your demand of oxygen. This technique should be used as last resort.

If the casualty falls and is directly unconscious, the time frame for rescue described above (10-25min) is applicable.

Once the rescue is performed, you have to put the casualty in a special position. Normal first aid rules don't apply here.

The accident is still potentially lethal after the rescue is done. Unconscious and conscious casualties must not be allowed to lie flat on the floor or put into the shock position (see Figure 0–5). There is a danger of releasing the toxins which have been accumulated in the blood stuck in the legs during suspension.

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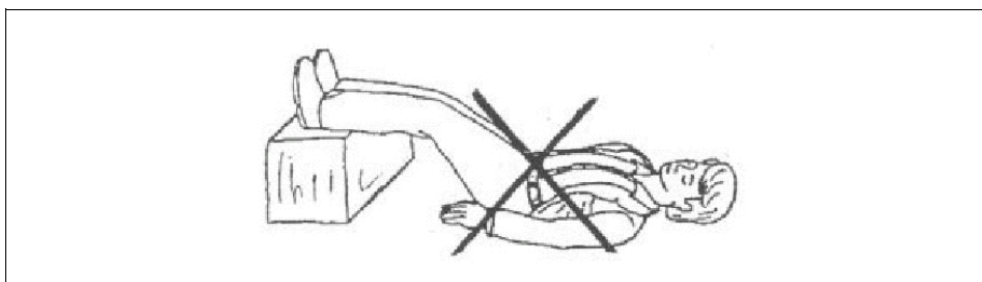


Figure 0-5: Shock position, unsuitable for a person with a suspension trauma (orthostatic shock)
Follow the instructions below to perform a good rescue:

- Do not delay the rescue of the casualty.
- When performing the rescue make sure that both, the casualty and the rescuer, are always secured against falling.
- If the casualty is **conscious**:
Bring the casualty into a squatting position (see Figure 0-6). It is possible to use the lanyard to keep the leg in good position. The casualty should remain in this position for at least 30 min.



Figure 0-6: Appropriate position for person with a suspension trauma when conscious (squatting position)

- If the casualty is **unconscious with stable breathing**:
Put the casualty in the recovery position (stable side position), but in the case of a suspension trauma the recovery position should be inclined (head and upper body higher than the legs). Also bend both legs of the casualty.
- If the casualty is **unconscious without stable breathing**:
Perform conventional resuscitation measures (30 x cardiac massage altering with 2 x artificial respiration). If breathing becomes stable, see points above for correct positioning.



In the event of an emergency the ambulance has to be called immediately, even if the casualty seems to be ok again.

101.16.5 Working at Heights:

- Wear a full-body harness when working at heights.
- Always be insured to an anchor point while working at heights (inside and outside the tower).

101.16.6 Working on the Nacelle Roof:

Before entering the nacelle roof it must be ensured, that every person is secured properly. The following aspects have also to be observed:

- The number of personnel on the turbine must not exceed the maximum allowed number, which depends on the available equipment and the turbine specification.
- Ensure that there are enough attachment points for all operators.
- The attachment points on the GRP can be considered for use (~3kN/m² load resistance)
- All anchor points have to be marked with defined colour.



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If someone is about to go on the nacelle roof, all other present persons have to be informed!
It is not allowed to go/remain on the nacelle roof in bad weather conditions.

101.17 TRANSPORTING TOOLS:

- Carry small tools and liquids in a bag attached to the safety belt to keep both hands and arms free.

101.17.1 Using the Internal Crane:

The WTG is equipped with an internal crane for transporting material (e.g. tools) and lifting heavy parts for maintenance work (see Figure 0–8). Only trained persons may operate the crane. Larger tools have to be transported by this crane. Observe the following points for a safe operation (see Figure 0–7).



Falling Hazard!

Crane operators must wear safety harnesses and secure themselves during lifting operations (before the crane hatch is opened and until it is closed).

- Use safe and suitable containers.
- Secure the load against falling.
- Observe the working load limit (WLL) and operating manual of the crane. Do not carry load beyond this limit.
- Only use load suspension devices with the appropriate WLL for the load minimum.
- Transport loose parts only on load suspension devices and do not load over the edge.
- Partition loads so that they fit through the hatches and doors.
- Take care that the load does not get caught in components of the tower.
- Lower the speed when the load passes parts where there is a higher risk of the load getting stuck.
- Listen to any changes in the motor sound, changes can signify that the load got caught.
- Observe the Centre of Gravity (COG) of every component you are going to lift.
- Always position the crane hook in the centre of the load.
- Guide long parts with guiding ropes.
- When lifting the load, do not remain between the load and fixed objects (walls, machines, piles, etc.).
- Hang empty and unloaded lifting gears high above the ground, store sling gears safely and properly.
- Do not knot ropes, chains and bands or rag them over sharp edges. Cover the edges or use protective hoses.
- A second person has to secure the load against swinging by means of a safety rope.
- Do not walk or remain under suspended loads.
- Do not lift the loads higher than required.
- Loosen the sling gears only if the load has been safely deposited.

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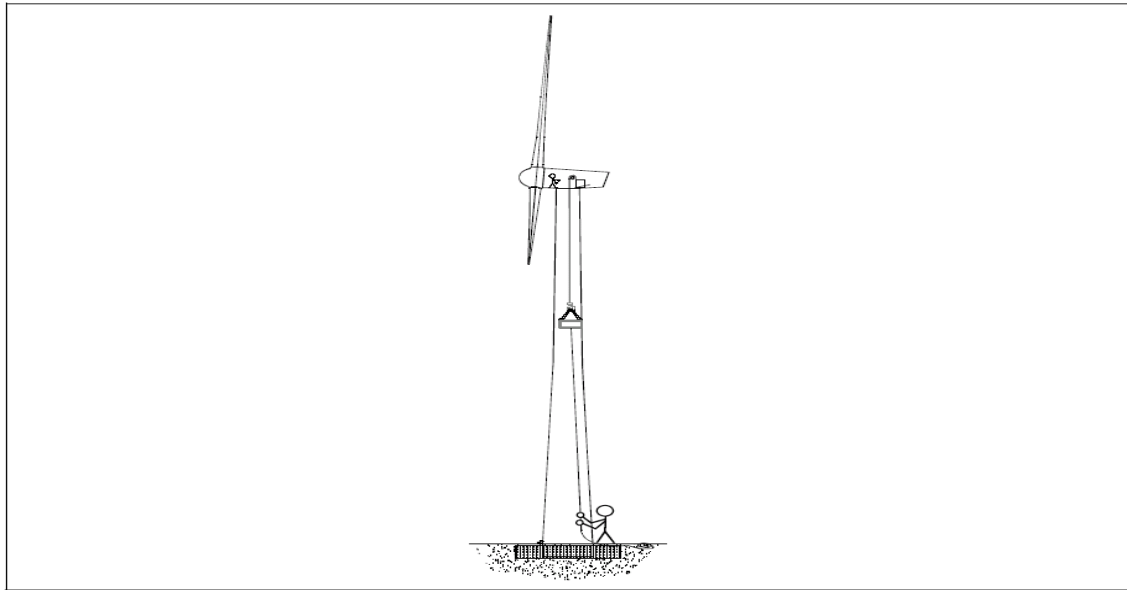


Figure 0-7: Usage of the internal crane

When operating the crane, proceed as following (see Figure 0-8):

- (1) Unlock the crane hook (37)
- (2) Loosen the brake pins (27) in the hinge.
- (3) Guide the crane hook through the opening in the nacelle base.
- (4) Lower the crane hook by pressing the down button.
- (5) Lift the crane hook by pressing the up button.

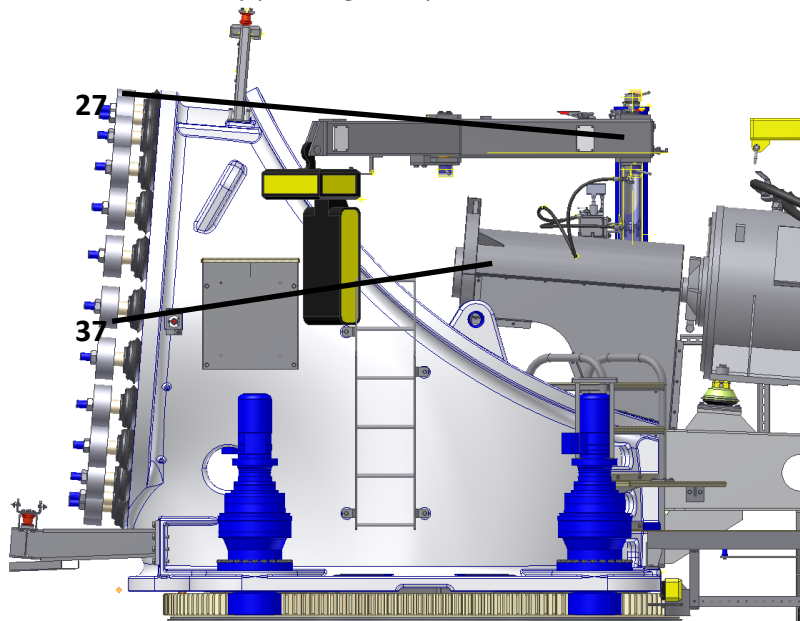


Figure 0-8: Example of an internal crane of a nacelle

101.18 TOOL USE:

All persons working with tools must be instructed in their use prior to commencing work.
Electrical tools have to be earthed or double-insulated.

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- Check all tools for damages prior to use.
- Warn people standing nearby before work with tools is commenced.
- Only use conventional socket outlets for powered electrical tools.
- Keep fingers and other body parts free from operating hydraulic tools when they are pressurized.
- Avoid holding hydraulic hoses in the hands when tools are working with pressure.
- Use gloves.

101.18.1 Hydraulic Torque Wrench Usage:

For detailed information how to use the tools and how to adjust the tightening torque, please refer to the tool instruction manual. Ask your supplier for detailed training if you are going to tighten the bolts by yourself. If you are hiring a third party for doing the work, make sure they use the correct equipment and most importantly, that they are tightening the bolts with the correct torque values. An example of a hydraulic torque wrench is shown in Figure 0–9.



Figure 0–9: Example of a hydraulic torque wrench

- Ensure that no person is in front of the Hytorc tool during tightening!
- Keep your head away from the tool.
- Before using the Hytorc tool, mark and blockade the area in front of the tightening in a way that no person can enter this area during the use of this tool.

101.19 HOUSEKEEPING:

WTG, site and workshop shall be kept in a clean state at all times. This includes the following actions:

- Clean all liquid spills immediately.
- Remove any contaminant (e.g.: Grease and oil) from the passages and ladders.
- Keep tower platform hatches closed at all times.
- The workplace has to be cleaned up of all tools, waste and materials.

6. POWER TO AMEND:

- Any change of the guideline shall have to be approved by the Corporate Quality.
- The management shall have the overriding right to withdraw and / or amend the guideline at its own discretion as it deems fit from time to time. The decision of the management shall be final and binding.

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