

serentica

SOP – HIRA

Doc. No. SR/HSE/SOP/02

Revision No. 0

Publish Date: 27-Oct-23

Hazard Indetification & Risk Assesment

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Content

S.N.	Description	Page Number
1	Introduction	3
2	Scope	3
3	Abbreviations	4
4	Definitions	5-6
5	HIRA	7 – 15
	5.1. Identify the Hazards	8
	5.2. Identify Who might be Harmed and How	9
	5.3. Evaluate/Assess the Risk and Decide the Control Actions	10 – 13
	5.4. Record all the Findings, Implement Control Actions & Monitor Implementation	14
	5.5. Review the Assessment and Update the HIRA	15
6	Roles and Responsibility	16
7	Audit, Assessment and Compliance	17
8	HIRA Standard Template	17
9	References	17



1. Introduction

This document describes the guidelines for management of hazards and risks in all the activities performed across the offices and project sites. This document is aligned with the requirements of ISO 45001:2018.

2. Scope

This SOP is mandatory and applicable to Serentica Renewables projects & offices locations. Projects include long-term & short-term project sites under construction and asset sites under operations & maintenance.



3. Abbreviations

SR: Serentica Renewables

ALARP: As low as reasonably practicable

BC: Business Concern

CAPA: Corrective Action Preventive Action

HIRA: Hazard Identification Risk Assessment

HSE: Health, Safety and Environment

IPC: Interested Party Concern

LC: Legal Concern

OCP: Operational Control Procedure

PPE: Personal Protective Equipment



4. Definitions

Hazard: Source or situation with potential to cause harm. Harm can be to Human (Injury/ occupational illness), Property (damage), Environment or Reputation.

Risk: Risk = Likelihood x Severity

Risk Assessment: It means a process that seeks to identify hazards and determine the level of risk by taking into account the likelihood (frequency of contact or exposure to the hazard) & severity (Extent of harm due to the hazard) and the adequacy of any existing control measures.

Hazard Identification & Risk Assessment (HIRA): A Process to identify and evaluate the hazards, associated risks and relevant control measures for safe execution of activities. A Process to Recognize and Understand the Hazards that might arise in the course of the Organization's Activities and ensure that the risks to people arising from these hazards are Assessed, Prioritized and Controlled to a level that is Acceptable.

Risk Matrix: is a matrix for evaluating both the probability and severity of a specific hazard.

Risk Control: means the use of measures to control the risk to an acceptable level or ALARP.

Severity: The level of consequence of an event that could occur due to exposure to the hazard present.

Significant risk: Any activity falling either under legal, business or interested party concern or having a Risk Rating of more than '16'.

Acceptable Risk: An Acceptable Risk is a risk that has been reduced to ALARP level.

ALARP: ALARP (As Low as Reasonably Practicable) is often used in context with the residual risk and indicates that residual risk shall be reduced as far as reasonably practicable. Residual Risk is a risk that remains after controls have been implemented.



Controls: Methods used to manage risks associated with safety, health & environment. Controls are defined as per hierarchy based on most preferable option to least preferable. Controls can be Elimination, Substitution, Engineering control, administrative control and PPE's.

Offices: Offices mean all the permanent as well as temporary office set-up located at headquarters, registered office, regional office, projects office, plants office, etc.

Projects: Projects mean all the long-term & short-term project sites under construction and asset sites under operations & maintenance



5. HIRA

The framework for analysing and managing risk shall include developing a methodology for Hazard Identification & Risk Assessment (HIRA) & preparation of location specific HIRA taking into consideration the context of the organisation.

HIRA to be conducted for all activities carried out and the steps are followed as mentioned below:

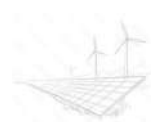
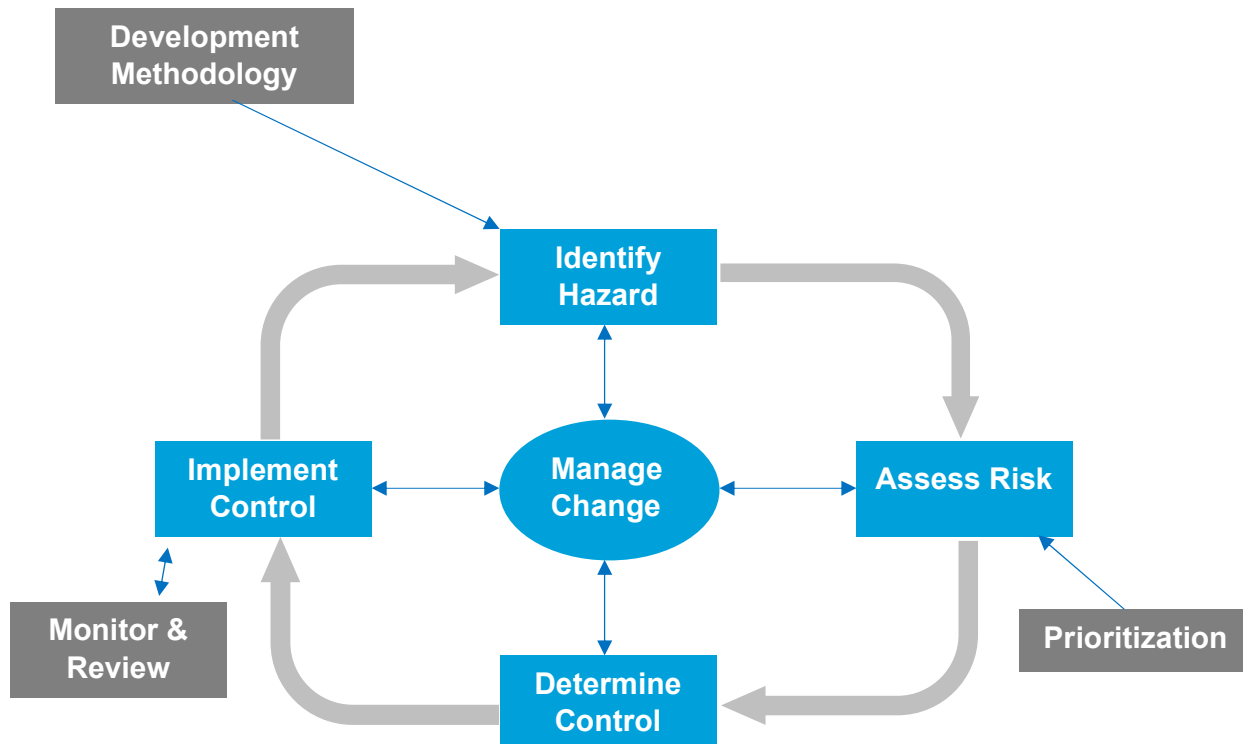
Step 1: Identify the Hazards

Step 2: Identify Who might be Harmed and How

Step 3: Evaluate/Assess the Risk and Decide the Control Actions

Step 4: Implement Control Actions & Monitor Implementation

Step 5: Review and update the HIRA periodically.



5.1. Identify the Hazards

5.1.1 Steps involved in Hazard Identification shall include but not limited to:

- Form a multidisciplinary team consisting of HSE Professional, Execution Professional, Technical expert, Worker Supervisor, etc.
- List the activity for which HIRA is to be done
- Break the activity into sub activity
- Start finding hazards by considering Sources of Hazards - People, Environment, Equipment and Materials
- Brainstorm over the Past, Present & Future Conditions of the Hazards (i.e. What has gone wrong in the past, what is Wrong in Present Condition & What may go wrong due to any change in future). Consider the visible, hidden as well as developing hazards.
- List out the Identified Hazards for Assessment

5.1.2 Hazard identification shall consider the different Types of Hazards in the workplace which includes but not limited to:

- **Physical** - Examples include Falling Objects, Working at Height, Manual Handling, Fire, Slippery Ground, Electricity, Noisy Equipment, Radiation, Equipment Hazards, Transport Hazards, etc.
- **Chemical (Inhalation or Contact)** - Examples include Inhalation of Hazardous Gases, Ingestion of Hazardous Chemicals, Storage of Chemicals, etc.
- **Biological (Contact with Living Organisms or their by-product)** - Examples include Insect Stings, Transmission of Bacteria, Virus e.g. COVID-19, Allergens, etc.
- **Ergonomic (Repetitive Strain)** - Examples include Inappropriate Workstation Design, Awkward Work Posture, etc.
- **Psychological (Mental Stress)** - Examples include Excessive Workload, Workplace Violence, Bullying, Behavioural hazards, etc.



5.2. Identify Who might be Harmed and How

Hazard identification shall consider who might be harmed & determine how they will be harmed. The list shall include but not limited to:

- Workers Carrying out the task
- Visitors
- Maintenance Staff
- Property
- Environment
- Organisation Reputation



5.3. Evaluate/Assess the Risk and Decide the Control Actions

5.3.1 Likelihood is the Probability that the hazardous event will Occur & shall be determined using a Five Scale (rating) Classification given below:

Rating	Likelihood	Description
1	RARE	<ul style="list-style-type: none"> ▪ Event that is very unlikely to occur during the lifetime of an operation / project ▪ Greater than 25 years event.
2	UNLIKELY	<ul style="list-style-type: none"> ▪ Event that is unlikely to occur during the lifetime of an operation / project ▪ Typically occurs in 10 – 25 years
3	POSSIBLE	<ul style="list-style-type: none"> ▪ Event that may occur during the lifetime of an operation / project ▪ Typically occurs in 1 – 10 years
4	LIKELY	<ul style="list-style-type: none"> ▪ Event that may occur frequently during the lifetime of an operation / project ▪ Typically occurs once or twice per year
5	ALMOST CERTAIN	<ul style="list-style-type: none"> ▪ Recurring event during the lifetime of an operation / project ▪ Typically occurs more than twice per year



5.3.2 Severity is the Degree of Harm due to the hazard & shall be determined using a Five Scale Classification as:

Rating	Consequence	Description
1	MINOR	<p>Safety: Low level short term subjective inconvenience or symptoms. Typically, a first aid and no medical treatment.</p> <p>Health: Reversible health effects of little concern, requiring first aid treatment at most.</p> <p>Environment: Promptly reversible impact</p>
2	MEDIUM	<p>Safety: Reversible injuries requiring treatment but does not lead to restricted duties. Typically, a medical treatment.</p> <p>Health: Reversible health effects of concern that would typically result in medical treatment.</p> <p>Environment: Near source confined and short-term reversible impact.</p>
3	SERIOUS	<p>Safety: Reversible injury or moderate irreversible damage or impairment to one or more persons. Typically, a lost time injury.</p> <p>Health: Severe, reversible health effects of concern that would typically result in a lost time illness.</p> <p>Environment: Near source confined and short-term reversible impact (typically, a month)</p>
4	MAJOR	<p>Safety: Single fatality and / or severe irreversible damage or severe impairment to one or more persons.</p> <p>Health: Single fatality or irreversible / permanent health effects or disabling illness. Will include effects of known and suspected human carcinogens, mutagen, teratogens and reproductive toxicants, progressive chronic conditions and / or acute / short-term high-risk effects.</p> <p>Environment: On-site: Impact that is unconfined and requiring long-term recovery, leaving residual damage (typically years); Off-site: Near source continued and medium-term recovery impact (typically a month).</p>
5	CATASTROPHIC	<p>Safety: Multiple fatalities or permanent damage to multiple people.</p> <p>Health: Multiple fatalities or serious disabling illness to multiple people. Will only apply to the effects of known human carcinogens, mutagens, teratogens and reproductive toxicants and life-threatening respiratory conditions and falciparum malaria.</p> <p>Environment: Impact that is widespread, unconfined and requiring long-term recovery leaving major residual damage (typically years).</p>



5.3.3 Risk Rating

Based on the estimated risk level, additional effective and practicable Risk Controls shall be identified to reduce the risk level to an acceptable level or ALARP Level (As low as reasonably practicable).

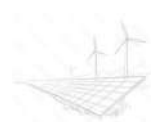
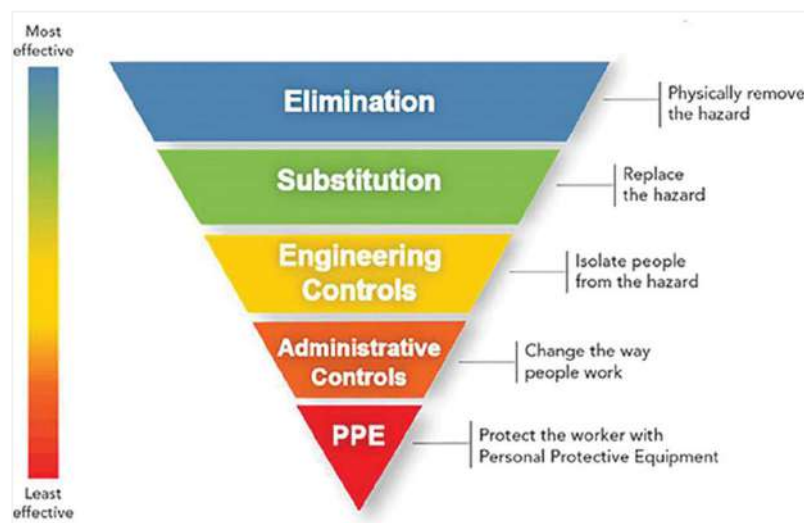
Risk Matrix	Consequence				
Likelihood	1 Minor	2 Medium	3 Serious	4 Major	5 Catastrophic
1 Rare	1	2	3	4	5
2 Unlikely	2	4	6	8	10
3 Possible	3	6	9	12	15
4 Likely	4	8	12	16	20
5 Almost Certain	5	10	15	20	25



5.3.4 Risk Control Hierarchy:

The hierarchy presents controls in order from most effective to least effective.

- **Elimination:** Avoiding the risk altogether by physically removing the hazard shall be considered as the first option.
- **Substitution:** If practicable, Substitution of a substance, product, activity etc. having high hazard with a substance, product, activity etc. having low hazard shall be considered.
- **Engineering Controls:** In case Risk can't be eliminated or reduced through substitution, engineering controls shall be considered to isolate the people at risk from the hazard. Examples of engineering control measures include fully automated processes; application of interlocks; installation of safety valve; alarm & detection system etc.
- **Administrative Controls:** In case Elimination, Substitution and Engineering Controls are not enough to control the risk, Administrative Controls shall be considered to control the risk by changing the way people work. Examples of administrative control measures include safe work instructions, signages, training, supervision etc.
- **Personal Protective Equipment:** PPE shall be considered as the last resort for controlling the risk. Use of specific PPE's shall be mandatory for all activities. Examples include Safety Helmets, Safety Shoes, Goggles, Nose mask, Respirators, Earmuffs, Safety harness, etc.



5.4. Record all the Findings, Implement Control Actions & Monitor Implementation

5.4.1 The findings and summary of the hazard identification & risk assessment shall be recorded preferably in a HIRA template. HIRA will be reviewed & approved by concerned Project manager and HSE lead.

5.4.2 Operational Control Procedure (OCP) shall be prepared for the activity based on the Risk based Control Plan to implement the risk controls.

5.4.3 The Hazards, Risks & their Control Measures shall be Communicated to the Relevant People (Management Employee, Workers, Supervisors, Drivers, Operators, etc.) through Training Sessions, Toolbox Talk Meetings, etc. for awareness & ease in implementation.

5.4.4 The implementation of defined and documented risk control actions shall be monitored through periodical inspections and audits during the execution phase of the activity.



5.5. Review the Assessment and Update HIRA if required

5.5.1 Hazard identification and risk assessment (HIRA) shall be reviewed as and when any changes are implemented to any activity, process, equipment, or existing risk control measures. In any case, HIRA shall be reviewed at least once each year i.e. annual frequency. Some of the Situations which require review of Risk assessment are:

- Outbreak of epidemic or pandemic
- Implementation/Installation of any new process, facility, equipment, or material
- Modification of existing processes/facility/equipment/raw material
- Any change from normal operation in work environment e.g. due to COVID-19
- Any changes in operational parameters
- During expansion, contraction, restructuring of workplace
- New or modified technology, legislation etc.
- New information/inputs from interested parties
- After Incident due to Hazard Exposure
- Changes Proposed by CAPA (Corrective Action Preventive Action)
- New or revised procedures, work practices, designs, specifications or standards
- Significant changes to the site's organizational structure and staffing, including the use of contractors and sub-contractors

5.5.2 The register/database shall be updated as and when any changes are carried out. The older versions of HIRA database shall be retained for a minimum project completion.



6. Roles and Responsibility

The key roles and responsibilities:

- **Project Head & QHSE Head:** shall ensure preparation of project specific HIRA & monitor the compliance on a regular basis to assess the support required by the site, evaluate them and make necessary arrangement to smoothen the implementation.
- **Project Manager:** shall be responsible for effective implementation of the HIRA framework at project and office sites respectively. He shall provide resource, plan and monitor for effective implantation and ensure that all reports to Head-office are being sent in time. He shall be responsible for closure of safety inspections and audit observations.
- **Project HSE lead:** shall assist in developing the site-specific HIRA with relevant stakeholders and ensure periodic inspections to verify the implementation of control measures. He shall report any deviations from the defined risk controls to all the concerned personnel & Stop work if major deviation is observed which may lead to major accident and allow resumption of work only after all prescribed controls are put in place.
- **Employees & Workers:** shall be responsible for assisting in implementation of control measures as defined in the HIRA document. They shall complete required training and demonstrate an understanding of this standard. Anybody seeing an incident &/or unsafe act/condition shall report to his supervisor or site safety leader.



7. Audit, Assessment and Compliance

The Compliance for the implementation of this SOP shall be verified during periodical audits and reviews as per audit and review plan.

8. Annexure

8.1. HIRA Template: Please take reference from below template and Project / EPC team can further enhance the details in the template

Project/Office:										Version:			
										Date:			
Prepared by:					Reviewed & Approved by:								
S.N.	Activity	Sub-activity	Identified Hazards	Consequence/ Risk	Risk Before Risk Reduction			Control Measures	Risk After Additional Control Measures (Residual Risk)			Action by	Remarks
					Likelihood	Severity	Risk Rating		Likelihood	Severity	Risk Rating		
							0				0		
							0				0		
							0				0		

9. Reference

- a. ISO 45001:2018
- b. QHSE Policy
- c. Local Statutory and Regulatory requirements

