

**Revision History**

Description	Last Rev No.	Current revision No.	Amendments made
SW/HSE/P03-Rev00	NA	00	New Document
SW/HSE/P03	00	01	The Corporate HSE function was removed.

### 1. PURPOSE AND SCOPE

To establish and implement a process, that is ongoing and proactive:

- for occupational hazard identification & risk assessment and environmental aspect & impact study for all activities and services that it can control and those that it can influence.
- to identify the critical environmental impacts considering the life cycle perspective.

### 2. APPLICABILITY

This procedure applies to the Sterling & Wilson Projects and Operations & Maintenance

### 3. DEFINITION OF TERMS

- **Interested party /stakeholder:** Person or organization that can affect, be affected by, or perceive itself to be affected by a decision or activity.
- **Worker:** A person performing work or work-related activities that are under the control of the organization
- **Legal requirements and other requirements:** Legal requirements that an organization must comply with any other requirements that an organization must or chooses to comply with.
- **Management system:** Set of interrelated or interacting elements of an organization to establish policies and objectives and processes to achieve those objectives
- **HSE policy:** intentions and direction of an organization as formally expressed by its top management
- **Injury and ill health:** adverse effect on the physical, mental, or cognitive condition of a person
- **Hazard:** Source with a potential to cause injury and ill health
- **OH&S risk:** Combination of the likelihood of occurrence of a work-related hazardous event(s) or exposure(s) and the severity of the injury and ill health that can be caused by the event(s) or exposure(s)
- **Process:** Set of interrelated or interacting activities which transforms inputs into outputs
- **Incident:** Occurrence arising out of, or during, work that could or does result in injury and ill health
- **Environmental:** Surroundings in which an *organization* operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelationships
- **Environmental aspect:** Element of an *organization's* activities or products or services that interacts or can interact with the *environmental*
- **Environmental Impact:** Change to the *environment*, whether adverse or beneficial, wholly, or partially resulting from an *organization's environmental aspects*
- **Prevention of pollution:** Use of *processes, practices, techniques, materials, products, services* or energy to avoid, reduce or control (separately or in combination) the creation, emission or discharge of any type of pollutant or waste, to reduce adverse *environmental impacts*
- **Life cycle:** Consecutive and interlinked stages of a product (or service) system, from raw material acquisition or generation from natural resources to final disposal

**4. RESPONSIBILITIES AND ACCOUNTABILITIES**

- 4.1 Project Manager / HOD shall be accountable for HIRA-AIA and determining control for the workplace
- 4.2 Project manager shall delegate responsibility to the Site In-charge / Site engineers, designated HSE in charge of conducting the study and determining controls, considering inputs from the site team
- 4.3 Workers shall provide inputs/feedback to their PM/HSE in-charges during this study
- 4.4 MA / PM shall seek assistance from the team members, associates, and other employees concerned for appropriate involvement in HIRA-AIA as required.

**5. DESCRIPTION OF PROCEDURE:**

Input	Process	Output	Resp
<p>Following are the inputs to identify the OHS hazards and environmental aspects</p> <ul style="list-style-type: none"> <li>• All project and O&amp;M activities, processes, and services</li> <li>• Routine and non-routine, normal and abnormal activities and situations considering:                             <ul style="list-style-type: none"> <li>– Infrastructure and physical conditions of the workplace,</li> <li>– Equipment, materials, and substances</li> <li>– design, service, testing, assembly, modification, maintenance, and disposal</li> <li>– human factors.</li> <li>– How the work is performed.</li> </ul> </li> <li>• Social Factors</li> <li>• Past incident and emergency data</li> </ul>			

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<ul style="list-style-type: none"> <li>• Potential emergency situations</li> <li>• Personal factors of workmen (direct and indirect), contractors, staff, and visitors.</li> <li>• Other persons and situations in the vicinity not in direct control of SW but may affect adversely.</li> <li>• Human capabilities and ergonomics, machinery, and equipment in use</li> <li>• Plant layout</li> <li>• Change in processes, activities and layout, knowledge and information, and equipment.</li> </ul>			
	<p>Selection of team to carry out OHS hazard identification &amp; risk assessment, environmental aspect &amp; impacts relevant to the activities including workmen.</p> <p>A team will be selected considering their relevant experience in a similar activity.</p>		Project Manager
	Identify the activities		Site Team

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	Sequencing into the sub-activities		Site Team
	Classify these activities into a routine, non-routine, normal, abnormal, and Emergency situations		Site Team
	Determine whether legal requirement		Site Team
	Identify the people involved such as workers, staff, visitors, passers-by, neighbours		Site Team
	List down all the OHS hazards and environmental aspects, considering the lifecycle perspective of the input materials for activities & services, which are under the organisation’s direct control, or can influence.		Site Team
	Identify OHS risks and Environmental impacts associated with OHS hazards and environmental aspects listed		Site Team
	Identified OHS risks shall be assessed considering the existing control measures based on their Probability and Severity of occurrence on a 1 to 5 scale as described in Section 5.1 Risk matrix.  Identified environmental impacts shall be assessed considering the existing controls measures based on Probability of occurrence and Scale, Severity, Duration, Carbon emissions and Social Impact, on a 1 to 5 scale as described in section 5.1		Site Team
	Evaluation of OHS risks shall be carried out to determine the		

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	<p>level of risk as Low, Medium, High, and Extreme as described in section 5.1.</p> <p>Evaluation of environmental impact shall be carried out to determine the level of impacts as Non-significant, Medium, High, and Catastrophic as described in section 5.1.</p>		
	<p>Identify and describe the type of control measure by Elimination, substitution, Engineering control, Administrative and PPE.</p>		Site Team
	<p>Evaluation of residual OHS risks shall be carried out to determine the level of risk as Low, Medium, High, and Extreme as described in section 5.1. High and Extreme risks are not acceptable.</p> <p>Evaluation of residual environmental impact shall be carried out to determine the level of Non-significant, Medium, High, and Catastrophic as described in section 5.1. High and Catastrophic impacts are Significant.</p>		Site Team
	<p>Determine whether the risk is Acceptable, the impact is non-significant and address significant impacts/not-acceptable risks.</p>	<p>In case of acceptable or non-significant the activity can be performed.</p> <p>In case of medium risk/impact existing control is to be monitored strictly</p> <p>In case of not- acceptable or Significant, either action shall be taken before the</p>	Site Team

		<p>commencement of the activity:</p> <ul style="list-style-type: none"> <li>- Eliminate the activity.</li> <li>- Develop a safe operating procedure (SOP)</li> <li>- Develop a management program.</li> <li>- Develop an EPRP</li> </ul>	
		<p>Once the HIRA-AIA register is completed, it shall be reviewed by site HSE and approved by the project manager</p>	<p>Site HSE and PM</p>

### 5.1 HIRA EVALUATION MATRIX

PROBABILITY RATING CRITERIA	
Chances of occurrence several times in normal activity during the project lifecycle	Frequent (5) Certain
Limited chances of occurrence during normal activity but may occur occasionally during a project's lifetime	Probable (4) Likely
Unlikely to occur during similar activity in normal operational circumstances but may occur in unusual conditions	Possible (3)
Unlikely to occur when considering similar past activity/service but could well occur.	Remote (2)
Shall virtually never occur in the entire activity	Improbable (1)
SEVERITY RATING CRITERIA	
The presence of hazard may result in Fatality / Multiple hospitalization / Permanent disability/ Work stoppage for more than a day/requirement of Statutory authority reporting	Extreme (5)
The presence of hazard may result in LTI / Hospitalization/ Temporary disability/ Work stoppage for a shift / critical client concern	Severe (4)
The presence of a hazard may result in minor injury/illness to a single person exposed to that hazard and may require out-of-the-premises treatment for the injury. Work stoppage may happen up to 0.5 man-days	Moderate (3)
The presence of hazard may result in "no major injury / ill-health" to any person but can result in first-aid cases and near misses. There is a minimal adverse impact on the task being executed up to a maximum of 0.5 hours.	Minor (2)
The presence of hazard does not/ will not result in any injury/illness to any person.	Negligible (1)
RISK CATEGORIES / CONCLUSIONS	



Hazard must be avoided (or the level of risk reduced significantly and reliably by additional measures)	<b>EXTREME (16-25)</b>
Hazard should be avoided (or the level of risk reduced significantly and requires review/approval from Project Manager and HSE in charge)	<b>HIGH (11-15)</b>
Risk to be controlled as low as reasonably practicable (existing control to be monitored strictly)	<b>MEDIUM (6-10)</b>
Risk is controlled as low as reasonably practicable – No further control measure is necessary	<b>Low (1-5)</b>

<b>HIRA MATRIX</b>					
<b>PROBABILITY</b>	<b>SEVERITY</b>				
	<b>Negligible (1)</b>	<b>Minor (2)</b>	<b>Moderate (3)</b>	<b>Severe (4)</b>	<b>Extreme (5)</b>
<b>Improbable (1)</b>	1	2	3	4	5
<b>Remote (2)</b>	2	4	6	8	10
<b>Possible (3)</b>	3	6	9	12	15
<b>Probable (4)</b>	4	8	12	16	20
<b>Frequent (5)</b>	5	10	15	20	25

**5.2 AIA EVALUATION MATRIX**

**HAZARD IDENTIFICATION, RISK ASSESSMENT & ENVIRONMENTAL ASPECT – IMPACT ANALYSIS**

<b>Probability of Occurrence</b>	<b>Frequent</b> Chances of occurrence several times in normal activity during the project lifecycle	5	5	10	15	20	25
	<b>Probable</b> Limited chances of occurrence during normal activity but may occur occasionally during a project's lifetime	4	4	8	12	16	20
	<b>Occasional</b> Unlikely to occur during similar activity in normal operational circumstances but may occur in unusual conditions	3	3	6	9	12	15
	<b>Remote</b> Unlikely to occur when considering similar past activity/service but could well occur.	2	2	4	6	8	10
	<b>Improbable</b> Shall virtually never occur in the entire activity	1	1	2	3	4	5
		<b>1 - Negligible</b>	<b>2 - Minor</b>	<b>3 - Moderate</b>	<b>4 - Major</b>	<b>5 – Severe</b>	

<b>Scale of Impact</b>	Impact restricted within the immediate surrounding of occurrence	Impact Restricted within the extended surrounding of occurrence (in a single block, floor etc.). few drops of leakage, seepage etc.	Impact Restricted within the plant/site boundaries. E.g.-Nominal spills, local emissions etc.	Impact Restricted at immediate the boundary of the premises. ego-Major spills, discharge, bulk emissions, Major land contamination etc.	Impact beyond the immediate boundary and may impact the nearby Locality / Village/ Town. e.g.-Huge Spills, catastrophic emissions, major water body pollution, land contamination of vicinity, Local ecological destruction etc.
<b>Severity of impact</b>	Self-Assimilating	Reversible with little effort and can be managed locally without ERT	Reversible with moderate efforts and to be managed by the ERT/ specialized team.	Reversible with High Efforts and may involve help from local authorities.	Nonreversible and permanent and shall require help and reporting to local authorities/ ministry.
<b>Duration</b>	Deterioration lasts for less than 1 hour and is contained/cleared immediately	Deterioration lasts for one shift and the local team can contain/clear it.	Deterioration lasts up to one day and ERT/specialized team's help is required to contain/clear it.	Deterioration lasts up to a week and local authority's help is involved.	Deterioration lasts more than a week and help/reporting to the local authority is needed.
<b>Social Impact</b>		No social impact	The minor effect over the livelihood / social setup / local infrastructure for a short duration	Considerable impact on the local community through grievance/complaint.	Huge impact on community issues and complaints from the local bodies/statutory authorities
<b>Carbon Emission</b>		No Emissions	No increase/decrease in CE	A minor increase in CE	Huge increase in Carbon Emission due to any system/ equipment failure

**Note: Highest score of Sc, S, D, So, and Ca is to be considered as final severity and multiplied by Probability scope to arrive at the Final rating.**

5.3 Inputs shall be taken from employees for assessing the severity and probability of the identified hazards.

5.4 Past incidents shall be considered while conducting risk/impact assessment.

5.5 **OHS Not-acceptable means High and Extreme risks.**

5.6 **Environmental Significant means high and catastrophic impacts.**

**5.7 Hierarchy of Controls:**

Level of Controls	Controls	Description
A	Elimination	Elimination of process/dangerous operation, Reorientation of the workplace, Machines etc. to eliminate the hazards
B	Substitution	Alteration/Modification/Replacement of Machine, Tools, Substances etc. to minimize/reduce the risk
C	Engineering Control	Automation, Robotic Operations, Safety Guards, Limit Switches etc.
D	Administrative Control	Signage, Warnings, SOPs, Work Instructions, Motivational Programs, Training etc.
E	Personal Protective Equipment (PPEs)	Helmet, Nose mask, Aprons, Earmuffs/plugs, safety belts etc.

**6 Inclusion to OHS-Objectives**

- i. Not- acceptable OHS risk and Significant impact scores shall be considered in setting the organization’s objectives and targets. The Project Manager shall be responsible for selecting among the identified significant risks, which will be included in the objectives and targets.
- ii. Operational control guidelines shall be established and maintained to identify significant risks to prevent situations that could lead to deviations from the HSE Policy, Objectives, and Targets.

**7 Formats applicable:**

Sr. No.	Document No.	Title
1	SW/HSE/F431	HIRA-AIA Format
2	SW/HSE/F460	Legal Register