

Excel Telesonic India Pvt. Ltd. Hazard Identification and Risk Assessment Policy

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TITLE: Hazard Identification and Risk Assessment Policy

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1.0 PURPOSE

To establish, document, implement and maintain a documented procedure for hazard identification & risk assessment.

2.0 SCOPE

This procedure covers initial hazard review, risk assessment, evaluation and assessment criteria and determination of significant risks.

3.0 ABBREVIATIONS

Definition		
Hazard Identification and Risk Assessment		
Personal Protective Equipment		
Standard Operating Procedure		
Material Safety Data Sheet		
Safe Work Procedure		
Job Safety Analysis		
Work Health and Safety		
Occupational Safety and Health Administration		
Hazard Identification		
Job Hazard Analysis		
Lockout/Tagout		
Safety Data Sheet		
Control of Substances Hazardous to Health		
Material Safety Data Sheet		
Hazard Communication		
Hazardous Materials		
Hydrogen Sulphide		
Lower Explosive Limit		
Upper Explosive Limit		
Job Safety Analysis		
Hydrogen Sulphide		
Lower Explosive Limit		
Upper Explosive Limit		
Initial Hazard Review		
Risk Priority Number		
Radio Frequency		
Infra Frequency		



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4.0 DEFINITIONS

Term	Definition
Hazard	A potential source of harm or adverse health effect on a person or group. In excavation, hazards could include cave-ins, equipment accidents, contact with utilities, and falls.
Risk	The combination of the probability of an occurrence of a hazardous event and the severity of harm or health effects resulting from that event.
Likelihood	The chance that a hazard will cause harm or damage. It is usually expressed as high, medium, or low.
Severity	The degree of the potential harm or adverse health effect associated with a hazard. It is often categorized as high, medium, or low based on the extent of the impact.
Persons at Risk	The individuals or groups who may be exposed to the identified hazards during excavation work.
Control Measures	Protective measures and procedures put in place to eliminate or minimize the risks associated with identified hazards.
Protective Systems	Specific safety systems and equipment used in excavation, such as trench boxes, shoring, or sloping, to protect workers from cave-ins and other soil-related hazards.
Confined Space	A space with limited entry and exit points, not designed for continuous occupancy, and has potential hazardous atmospheres.
PPE (Personal Protective Equipment)	Specialized clothing or equipment that workers wear to protect themselves from specific hazards, such as hard hats, safety goggles, gloves, and high-visibility vests.
Underground Utilities	Buried utilities, such as gas lines, water pipes, electrical cables, or sewer lines, which may pose a risk if not identified and located correctly before excavation.
Access and Egress Points	Safe entry and exit points for workers and equipment to access the excavation site and evacuate in emergencies.
Emergency Procedures	Established plans and protocols to follow in case of accidents, injuries, or other emergency situations during excavation work.
Tolerable Risk	Level of risk that is considered acceptable and manageable within established criteria or standards. It indicates that the potential consequences and likelihood of an adverse event are at an acceptable level, and the risk is within the acceptable threshold as defined by the organization or relevant regulatory authorities
Acceptable Risk	Level of risk that is considered to be within the boundaries of what is deemed reasonably safe and manageable. Acceptable risk does not imply that the risk is entirely eliminated, but rather that it is at a level that is deemed reasonable and can be effectively managed through appropriate controls, safety measures, and risk mitigation strategies



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5.0 PROCESS DESCRIPTION

5.1 Initial Hazard Review:

The Workplace Health, Safety, and Environment (WHSE) team conducts an Initial Hazard Review (IHR) by thoroughly examining all locations, process areas, and activities. The purpose of the IHR is to identify potential hazards and risks across these areas. The IHR report will be kept and updated by the WHSE team members and will cover various parameters, such as work activity hazards, penetration hazards, machinery hazards, dust hazards, thermal hazards, electrical hazards, fire and explosion hazards, chemical hazards, biological hazards, physical hazards, psychological hazards, work environment hazards, confined spaces hazards, occupational hazards, and ergonomics and human behavior.



The data collected based on the above parameters will be documented in the IHR report by the respective team members. This data will serve as an essential input for identifying hazards and risks in different locations, process areas, and activities.

Methods:

The WHSE team member is responsible for collecting data for the IHR, which can be done by either visiting the specific locations, process areas, or activities directly or by engaging/interactions with the area supervisors or workers. In cases where the WHSE team member is involved in the activities, locations, or process areas, it becomes their duty to identify the hazards and risks associated with those areas.



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5.2 Hazards & Risks Identification:

The WHSE Head / team member will conduct a thorough hazard and risk identification for all locations, process areas, and activities. Significant hazards will be summarized based on the evaluation of hazards and risks. Those hazards and risks that have an impact on legal requirements will be consolidated. It is the responsibility of the WHSE team member to identify hazards and risks across all locations, process areas, and activities using the same methodology applied for the Initial Hazard Review (IHR).

The identified hazards and risks will be compiled and recorded for each respective location, process area, or activity. They will be updated in the Hazard Identification and Risk Assessment Register.

Hazard identification will encompass the following factors:

- Distinguishing between routine and non-routine activities, where routine activities involve regular operations or processes, and non-routine activities include maintenance or support tasks. These activities will be reflected in the risk assessment sheet.
- Addressing human behaviour, capabilities, and other human factors, such as negligence, attitudes, job competence, safety violations, and PPE non-compliance.
- Recognizing hazards and risks originating outside the workplace that may impact the health and safety of individuals at the workplace.
- Identifying hazards created in the vicinity of the workplace due to work-related activities and considering the complexity of nearby industries and their processes.
- Evaluating infrastructure, equipment, and materials provided by customers or contractors at the workplace.
- Considering temporary changes made to operations, processes, and activities and understanding their associated impacts.
- Ensuring the WHSE Team takes responsibility for hazard consideration and implements necessary actions.
- Taking safety hazards into account during the design of work areas, processes, installations, machinery/equipment, and operating procedures.
- When mobilizing projects, adhering to client requirements by submitting job safety analyses or conducting risk assessments when client specifications are not in place.
- If the hazards and risks identified have implications for legal requirements, the WHSE team member will consult with HR or Legal Team and indicate their applicability accordingly.



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5.3 Identification of Hazards:

The hazards identified will be evaluated under various conditions, including Routine, Non-Routine, and Emergency situations, using the following rating criteria:

Condition	Description
Routine	Hazards/risks occurring or present during routine activities, e.g., Installation, Testing, and Commissioning, Excavation and Drilling.
Non-Routine	Hazards/risks occurring or present during non-routine activities, e.g., during managing emergency situations, weather related challenges, safety incidents etc.
Emergency	Hazards/Risks leading to emergency situations.

5.3.1 Severity:

This criterion assesses the potential impact or degree of harm that could result from the hazard. It is usually categorized into levels such as:

- Low: Minimal or no injuries, minor property damage.
- Medium: Injuries requiring medical attention, moderate property damage.
- High: Severe injuries, fatalities, major property damage, or significant environmental impact.

Criteria	Description
Severity (Sev)	Indicates the magnitude of risk in terms of resource utilization and level of impact. The severity for a hazard could be derived from the table presented below.
Probability (P)	Indicates how frequently a hazard occurs. (This table remains applicable for Aspect Impact Determination as well).
Rating	The rating indicates the multiplication score of severity, probability, and present control. This value is considered the Risk Priority Number (RPN).



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5.3.2 Probability:

This criterion evaluates the likelihood or chances of the hazard actually occurring.

Probability is chosen from the table below:

Rating	Category	Description
1	Unlikely	The most improbable chances of a risk occurring
2	Rare	The chances of occurring are rare maybe once in three years
3	Likely	There is a chance of occurring and previous incidents examples
4	Very likely	Incidents/risk can occur at least once/twice in a year
5	Certainly	Incidents/risks can occur very frequently

5.3.3 Present Control:

This criterion assesses the effectiveness of existing control measures in place to mitigate the hazard. It is rated as:

- Adequate: Sufficient control measures are already in place to manage the hazard effectively.
- Partially effective: Some control measures are implemented, but further improvements may be needed.
- Inadequate: Existing control measures are insufficient, and significant improvements are required.

Using these rating criteria, the hazards will be evaluated to determine their overall risk level. The combination of severity, probability, and present control will help prioritize hazards for appropriate risk management actions. High-risk hazards with severe consequences, high likelihood, and inadequate control will require immediate attention and robust control measures, while low-risk hazards may only require routine monitoring or minor adjustments to existing controls.



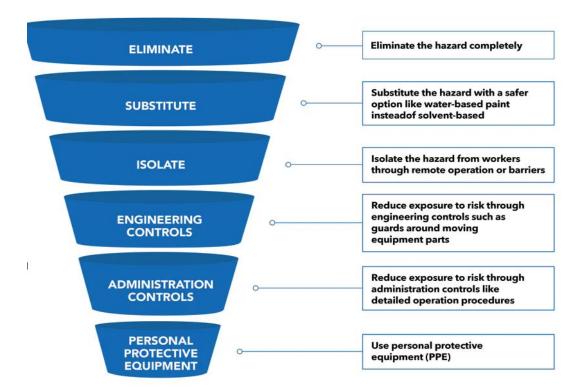
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TABLE 1:TYPES OF CONTROLS





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Severity could be derived from the below table.

Rating			Severity of	risk		
Score	Physical injury	sical injury Burn injury		Illness	Fumes / vapors / dust	Ergonomics
1	Negligible first aid injury - requiring first aid and person can return to work within 1 / 2 hours	Superficial burns with immediate recovery and person can return back to work immediately	Low exposure to RF radiation	Momentary discomfort/nuisance e.g., Headache, burning of eyes, giddiness a person can return back to work after rest	Particulate dust/fumes/gases have irritation in the nose when inhaled	Stress / Strain / Frustration / Depression
2	Marginal/medical treatment injury - requiring nurse or doctor's attention and a person can return to work within 24 hours	Superficial burns with recovery within two weeks and person can return to work	Low exposure to RF radiation	Minor health impact requiring nurse/doctors attention and person can return back to work within 48 hours	Particulate dust/fumes/gases have respiratory discomfort when inhaled	Effect on vision / Mild ache
3	Serious or injury resulting in temporary disablement – The person can return after a week	sablement within 5 weeks and low exposure to and a person can return		Breathing and visibility discomfort	Upper limb disorder / repetitive strain injury (RSI)	
4	Critical - Permanent Disabling Injury - Major / Internal injury requiring	First-degree burns with recovery within 2 months	Medium exposure to RF radiation	Major Health impact requiring doctor's attention person	Inability to breathe normally	High Blood pressure / Heart



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Rating	Severity of risk											
Score	Physical injury	Burn injury	Radiation/IF/RF	Illness	Fumes / vapors / dust	Ergonomics						
	hospitalization and the person can return to work within 8 weeks	and a person can return to work		returning to work within a month		disease / Nervous breakdown/ Sprain						
5	Catastrophic - Fatal Incident - Major accident resulting in Fatality	Second degree burns with 20% burns and recovery within 6 months to return to work	High exposure to RF radiation	Major Health impact requiring doctor's attention and person returns to work after one month	Severe exposure to dust or fumes	Intolerable occupational ergonomic risk						



5.4. Rating Score (RS)/ The Risk Priority Number (RPN)

The Risk Priority Number (RPN), also known as the rating score, is determined by multiplying the severity (impact) and probability of occurrence for each risk. The RPN serves as an indicator of the risk's priority, with higher values indicating greater significance. It is a numerical value calculated by multiplying the severity and probability of occurrence of a specific risk. It is used to prioritize risks based on their potential impact and likelihood of occurrence. The formula for calculating the RPN is as follows:

5x5 Risk Matrix Example How severe would the outcomes be if the risk occurred? What is the probability the risk will happen? Insignificant Minor Significant Major Severe 5 Almost Certain Medium 5 Very high 15 Extreme 20 Extreme 25 4 Likely Medium 4 Medium 8 Very high 16 Extreme 20 3 Moderate Low 3 Medium 6 Medium 9 Very high 15 2 Unlikely Medium 6 Medium 8 Very low 2 Low 4 1 Rare Very low 1 Very low 2 Low 3 Medium 4 Medium 5

 $RPN = Severity / Impact (Sev) \times Probability (P)$

The Risk Priority Number (RPN) derived from the rating will help prioritize hazards and risks, enabling the WHSE team to focus on mitigating high-risk areas more effectively. A risk severity table is used to categorize the severity of risks based on their potential impact or consequences.

The severity levels are usually defined in terms of the magnitude of harm, damage, or negative outcomes that may result from a specific risk. The risk severity table helps prioritize risks, allowing organizations to allocate resources and focus on addressing high-severity risks first to reduce their impact and likelihood of occurrence Here's an example of a risk severity table:

The severity and probability are typically rated on a predefined scale, and their product gives the RPN value. Higher RPN values indicate more significant risks that require immediate attention and appropriate risk mitigation strategies.

Significant risks are categorized based on the following criteria:

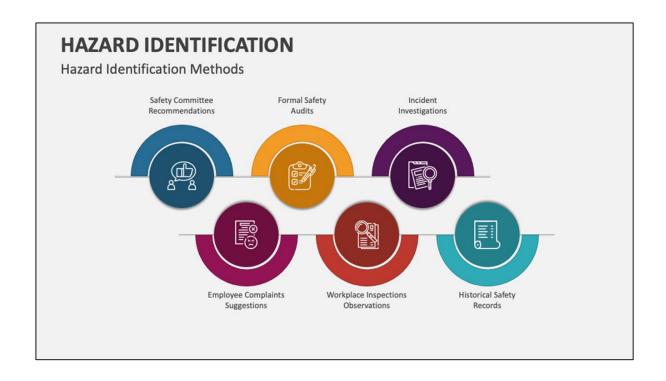
- Emergency Conditions: Risks that lead to emergency situations are considered significant. No specific rating is required for these risks as their potential impact is already evident.
- Applicable Legal Requirements: Risks that are associated with legal requirements are considered significant and must be given proper attention and mitigation measures.



• RPN 9 and Above: Risks with an RPN score of 9 or higher are considered significant due to their higher potential impact and likelihood of occurrence.

Value	Category	Description
1 – 3	Trivial	A less significant risk that requires no immediate actions. It may be monitored periodically.
4 – 8	Acceptable	The risk that is acceptable within existing controls and can be monitored but does not require additional measures.
9 -14	Moderate/Significant	The risk requires assigning and monitoring of controls to mitigate its impact.
15 -21	Substantial	The risk that requires urgent attention and immediate controls should be implemented without delay.
22 - 25	Intolerable	The risk is intolerable, and work should not proceed without applying effective controls.

5.5 Hazard Identification Methods





5.6 Establishing Controls

5.6.1 Evaluation of existing controls

Before implementing controls for significant hazards, a thorough evaluation will be conducted to assess the applicability, availability, and effectiveness of existing controls. This evaluation is crucial to ensure that any existing measures already in place are considered and utilized to their full potential before introducing additional controls for the identified significant hazards. The structure and effectiveness of the existing controls will be carefully analysed to determine if they adequately address the risks and provide sufficient protection for the individuals and the workplace.

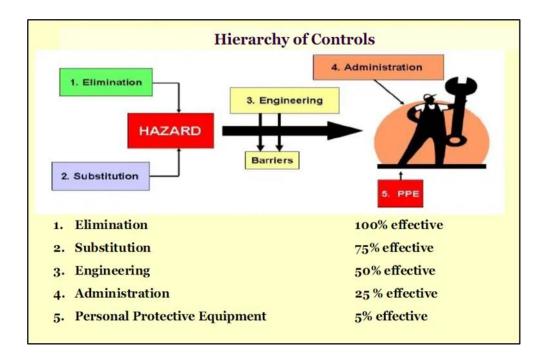
S. No	Category	Types and Examples				
1	Engineering controls	Fool proofing devices such as sensors, two-hand switches, safety guards/covers, Noise enclosures, Circuit breakers, etc.,				
2	Procedures / Work Instructions	Established, documented, and implemented operational control procedure or work instructions for the processes				
3	Competent/ Trained Personnel	Certified / skilled workers deployed for the process				
4	Material Safety Data Sheets	Display of material safety data sheets at process / work areas				
5	Medical Plan	Master/ regular health checkup, pre-employment health checkup, Inbuilt occupational health center				
6	Performance monitoring/ measurement	Monitoring and measurement tests such as ambient air quality water quality, noise and stack monitoring, forklift and lifting tackles certifications, calibration etc.,				
7	Work Permits/ Compliance to rules	Hot, cold, confined spaces, height, work permit and legal compliance and monitoring				

5.6.2 Determining Controls for Significant Hazards

The WHSE Team Members are required to adhere to the following hierarchy of controls to identify and implement appropriate measures for significant hazards. The controls selected will be documented in HIRA:

Hierarchy of Controls	Description
(a) Elimination	Initially, hazards are considered for elimination, and measures are taken to remove the hazards at their source.
(b) Substitution	If hazards cannot be eliminated, substitution methods are explored to replace the hazardous elements with safer alternatives.
(c) Engineering Controls	Engineering controls involve changes in machine or process design to minimize or isolate hazards.
(d) Administrative Controls	Administrative controls are established through procedures and supervision to govern the activities and minimize risk.
(e) Personnel Protection	Personnel protection measures are considered to provide additional safeguards and protection for employees.





5.7 Communicating and Reviewing Hazards Risks and Controls for Significant Hazards

The WHSE Head is responsible for distributing the Hazards Identification and Risk Assessment Register to the respective Vertical Managers/Heads/ Operations Team.

The WHSE Head is required to review the Hazards Identification and Risk Assessment Register based on the following conditions:

- 1. Change in Layout: Any significant changes in the workplace layout that may affect hazards and risks must prompt a review of the registers.
- 2. Change of Materials/Chemicals Used: If there are alterations in the materials or chemicals used in the processes, a review of the registers is necessary to assess the new risks.
- 3. Change of New or Modified Activities: Whenever new or modified activities are introduced; a review of the registers is essential to identify any additional hazards and risks associated with these activities.
- 4. New Project and Job Safety Analysis Submission: For new projects, a job safety analysis submission is required, and a review of the registers should be carried out to address project-specific hazards and risks.

Note: The review of the registers should be conducted at least once a year or whenever any of the above changes take place, whichever occurs earlier. This ensures that the registers remain up-to-date and accurately reflect the current hazards and risks in the workplace.



5.8 Job Safety Analysis (JSA)

A Job Safety Assessment, also known as a Job Safety Analysis (JSA) or a job hazard analysis (JHA), is a systematic process used to identify potential hazards and assess the associated risks of specific job tasks or activities. The primary objective of a job safety assessment is to enhance workplace safety by proactively identifying and mitigating potential hazards that could lead to accidents, injuries, or health issues.

The process of conducting a job safety assessment typically involves the following steps:

- 1. Task Identification: Identify and break down each step of the job or task being analysed.
- 2. Hazard Identification: Identify potential hazards associated with each task step. These hazards can be physical, chemical, ergonomic, or any other factors that may pose a risk.
- 3. Risk Assessment: Evaluate the severity and likelihood of the identified hazards. This step helps prioritize the most critical hazards that require immediate attention.
- 4. Control Measures: Develop and implement control measures to eliminate or minimize the identified hazards. These controls may include engineering controls, administrative controls, and the use of personal protective equipment (PPE).
- 5. Documentation: Document the findings of the job safety assessment, including the identified hazards and control measures. This information is crucial for training, reference, and continuous improvement.
- 6. Review and Revision: Regularly review and update the job safety assessment as needed, especially when there are changes in job tasks, processes, or work conditions.

A well-executed job safety assessment helps create a safer work environment by increasing awareness of potential risks and promoting the adoption of appropriate safety measures. It involves collaboration among employees, supervisors, and safety professionals to ensure comprehensive hazard identification and effective risk management.



1 Hazard Identification Plan

ACTION	DESCRIPTION	ASSIGNED TO	START DATE	DUE DATE	DATE TO REVISIT	NOTES
EXISTING HAZARD IDENTIFICATION						
Survey employees						
Review historical documents and records of hazards						
Conduct and document inspections	Internal, insurance carrier, consultants, etc.					
Check operating manuals						
Conduct health and safety committee meetings						
NEW HAZARD IDENTIFICATION						
Identify regular / routine situations						
Identify nonroutine / emergency situations						
Develop checklist of hazards to look for	Electrical, fire, slip, trip, fall, equipment operation hazards, etc.					



DETERMINE AND ASSESS				
HEALTH HAZARDS				
Chemical hazards				
Physical hazards				
Ergonomic hazards	Heavy lifting, repetitive motions, etc.			
INVESTIGATE INCIDENTS				
Create plan for conducting investigations	Who, what, where, and when of processes			
Conduct necessary training				
Investigate near-miss incidents				
Identify and analyse root cause of issues				
Analyse existing control measures				
Create action plan to mitigate future hazards				
ONGOING MEASURES				
Schedule regular health and safety meetings				
Send quarterly or semi-annual surveys to employees				
Conduct quarterly or semi-annual inspections				



2 Hazard Identification and Risk Assessment Template (example: Excavation)

	Ref:																		
Section / Dept: Civil Name of Contractor:-			Activity: Risk Assessment for Manual Excavation	Lo	cati	ion/	Are	a:-											
Sl No.	Basic Job Steps	Potential Hazard	Consequence	Current control measure	Ri					ity				Risk rating				Probability	Residual risk
					P	E	Α	R		P	E	Α	R						
		Fall in an excavated pit	Serious Injury/Fatality	Barricading of the area Allow only authorized persons inside the barricading	2	0	0	1	2										
1	Manual Excavation	Damage to underground pipeline	Injury and loss of production	Excavation is only done through a permit to work	0	1	2	1	2										
		Damage to underground cables	Serious Injury/Fatality	Follow the permit-to-work system	1	0	1	1	2										



		The collapse of building and adjoining structure	Get Injury/Fatality	Excavation shall be done with proper sloping, and it should be properly shored	1	0	2	1	2							
														\vdash		
	Additional Control	Magazza												\vdash		
	Additional Control	Measure												Ш		<u> </u>
1	Slip of Man/ Materia	als during ascending and	d descending in the e	excavated pit]	Prop	er a	cces	s to b	e provided for as	cending a	ınd o	lesc	endiı	ng	
2	Material or any equip	pment should not be sta	acked at the edge of	excavated pit												
3	Excavated materials	should not be stacked	at the edge of excava	ated pit												
	Prepared By			Approved By						Reviewed By						
	Contractor			Contractor												
Date				Date		Date										



3 Risk Priority Number (RPN) Matrix

	5 (Very High) (Has happened more thanonce per year in the Divisions)	5 (Low)	10 (High)	15 (High)	20 (Very High)	25 (Very High)
Frequency	4 (High) (Has happened in the Division and more than once per year in the Company)	5 (Low)	8 (Medium)	12 (High)	16 (Very High)	20 (Very High)
	3	3	6	9	12	15
	(Medium) (Has happened in the Company)	(Low)	(Medium)	(Medium)	(High)	(High)
	2	2	4	6	8	10
	(Low) (Happened in the power industries globally last 20 Years)	(VeryLow)	(Low)	(Medium)	(Medium)	(High)
	1	1	2	3	4	5
	(Very Low) (Happened in the Industries globally the last 10 years)	(VeryLow)	(Very Low)	(Low)	(Low)	(Low)
		1	2	3	4	5
		(Very Low)	(Low)	(Medium)	(High)	(Very High)
				Severity		



4 Risk-Based Control Plan

RPN	Risk category	(Risk-Based Control Plan) Decision / What needs to be done?
< 3	Very Low Risk (Non- Significant)	Control Plan (CP) - 1 Activities having RPN < 3, are considered as acceptable risk. No additional controls are necessary other than to ensure that existing controls are maintained & implemented.
3 – 5	Low Risk (Non- Significant)	Control Plan (CP) - 2 Activities having RPN between 3 -5, are considered as acceptable risk. No additional controls are required unless they can be implemented at a very low cost i.e., improved supervision, and enhanced monitoring.
6 – 9	Medium Risk (Significant)	Control Plan (CP) - 3 Additional control measures shall be put in place to reduce the RPN to an acceptable level (less than 6). The risk reduction measures shall be implemented within a defined period. Arrangements shall be made to ensure that the controls are maintained.
10 –15	High Risks (Significant & Unacceptable)	Engineering control/Work Instructions (WI) shall be followed to reduce risk to an acceptable level (less than 6). In case of the absence of Work Instructions (WI), a Job/activity-specific Operational Control Plan (OCP) shall be developed and followed. The risk reduction measures shall be implemented within a defined period (before the start of work). The work activity should be halted until risk controls are implemented. If it is not possible to reduce the risk, the work should remain prohibited. Arrangements shall be made to ensure that the controls are maintained.
16 - 25	Very High Risks (Significant & Unacceptable)	Control Plan (CP) - 5 It shall include all the requirements of Control Plan (CP) - 4 and necessary changes by Engineering Controls (for example - Fully automated process, Application of interlocks, Installation of Safety Valve, Alarm & Detection System, etc.) to reduce risk to an acceptable level (less than 6). The work activity shall be halted until risk controls are implemented as Control Plan (CP) - 5. If it is not possible to reduce the risk, the work shall remain prohibited. Arrangements shall be made to ensure that the controls are maintained.