Job Safety Analysis Preparation And Risk Assessment

Sample Only

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1 PURPOSE

To ensure that Health and Safety related risks are identified, assessed, documented and managed in a consistent manner, and to provide consistent guidelines for producing Job Safety Analysis' (JSA) to minimise the risk of accidents, incidents and injuries.

The concepts and requirements within this Procedure are mandatory - it applies to all Calsta Personnel and Subcontractors. Specifically, they address risk assessment as an integral component of Calsta Risk Management and support our continuous improvement process. This procedure refers to the use of a qualitative risk assessment process.

2 DEFINITIONS

The following definitions apply throughout this document:

- **Shall** - A mandatory task that must be completed.
- **Should** - A recommendation that is advantageous to complete.
- **Client** - A representative of the Company requiring services to be completed by Calsta personnel.
- **ALARP (As Low As Reasonably Practicable) -** A level of risk that falls between the tolerable and intolerable ranges and cannot be reduced further without unrealistic expenditure or effort.
- **Consequence -** Consequences include all of the potential adverse impacts/effects on people, the environment, plant or property, or any combination of these. It is important to remember that a single hazard may be the cause for multiple events and in turn, any one incident can have multiple consequences. Consequences can result immediately as a result of an event or series of events or develop over time from a prolonged activity / process.
- **Critical Risk -** Any risk with the potential to produce moderate to catastrophic consequences – essentially all risks rated as High using the Risk Assessment Calculator.
- **Frequency -** The number of times an event or exposure to a hazard may occur within a specified timeframe, such as daily, weekly or annually.
- **Risk –** Risk is defined as the combination of the likelihood and level of consequence that could realistically result from a hazard or series of hazards.
- **Hazard -** A thing or situation with the potential to cause harm or undesirable conditions (consequences).
- **Incident -** an occurrence (or ongoing condition – a prolonged activity / process) that has the potential to result in adverse consequences to people, the environment, property / plant, or any combination of these.
- **JSA – J**ob **S**afety **A**nalysis is a step-by-step breakdown of a Critical Task to help identify hazards that could result in injury, damage or production loss. The hazards associated with each step of a job are identified, and control measures are put in place to minimise the risk of injury to personnel or damage to plant, equipment, property or the environment.
- **Likelihood -** The description of the realistic chance that something will actually occur. Within this Procedure the likelihood term is associated with qualitative risk assessments.
- **Probability -** A mathematical expression of the chance of a particular outcome. By definition, probability must be expressed as a number between 0 (no chance that it will occur) and 1 (definitely will occur) or converted to a percentage (0.9 means that there is a 90% chance that an event will occur).
- **Residual Risk -** The remaining level of risk left after hazard treatment measures have been implemented.
- **Risk Assessment -** A process of determining the level of risk resulting from a particular hazard or hazards.

- **Risk Register -** A register of all project activities that have been assessed as having a level of risk.

3 JOB SAFETY ANALYSIS

All Calsta activities and tasks shall be analysed to identify their safety. For all new or unfamiliar tasks, the work group involved must first complete a Job Safety Analysis before attempting to start the activity.

A risk analysis shall be performed during all stages of a Job Safety Analysis (JSA) development. The Calsta Admin Assistant shall keep a record of all completed JSA's.

Each time a task is to be performed, the supervisor concerned shall be responsible for searching the Calsta system for an applicable JSA, Risk Assessment (RA) and Safe Work Procedure (SWP). The workgroup must review any such JSA, RA or SWP before attempting to start the activity.

Where individual hazards are assessed at a risk rating above Moderate, High or Extreme, a formal control measure must be nominated from the hierarchy of controls.

Should the activity be performed regularly (more than 3 times) and have a risk ranking of Moderate to Extreme, a Safe Work Procedure and Risk Assessment shall be developed.

The task supervisor shall ensure that SWP and RA are reviewed at planned intervals after their initial development. Reviews will also be undertaken on a regular basis and whenever there is a reason to suspect the controls are no longer valid such as the occurrence of an accident or incident involving the task.

During these reviews, the risk assessment process shall be revisited to check the effectiveness of the control measures. Any review will usually involve consultation of employees performing the activity.

4 RISK ASSESSMENT PROCESS

Communication and consultation is important throughout the whole risk management process and needs careful planning in Step 1. This shall involve two-way dialogue with stakeholders (internal and external), rather than a one-way flow of information from the decision-makers.

4.1 Step One - Establish the Context

The framework within which the risk assessment process is to be conducted needs to be established:

i. Establish the scope of the risk assessment

The goals, objectives, scope and boundaries of the activity, or project, to which the risk process is being applied needs to be determined by considering which of the following features are being assessed:

- Risk to health, safety, environment, and/or community
- Risk at a Site/Project, for a Business Group, or the Company as a whole
- Risk associated with a single hazard, a single incident, or the total Site
- Risk associated with one phase of life cycle of an asset, or the entire life cycle

ii. Establish the risk assessment team

Relevant competencies, experience and independence must be considered in establishing the risk assessment team. This should include where possible, operators, engineering personnel, OHS&E personnel, supervisors, etc. A multi-functional team is usually appropriate to ensure all risks are captured and adequately treated. It may also be appropriate to include external stakeholders.

4.2 Step Two - Hazards Identified

This is the most significant step in the risk management process and involves two stages:

- Identifying hazards;
- Identifying potential incidents that can result from hazards.

Systematic and thorough identification of hazards shall follow an established format.

As part of this hazard identification process, background information is required for the workshop session both in the form of documentation, and the knowledge base of workshop participants. Background information includes:

- **Agents**: all possible inputs, outputs, storages, emissions (both routine and accidental), wastes, inventories;
- **Activities**: identify all major activities, such as transport (on-site), packaging, mobile equipment movements, loading and unloading, drilling, welding, assembly etc;
- **Processes**: process descriptions, flowcharts, production, maintenance, shut down and start-up, testing, manufacture, chemical treatment,
- **Site History**: information on past activities and practices carried out at the site, including incidents, production processes, chemicals uses, storages, waste disposal practices etc.

The background information is used to identify and categorise the hazards and to assess what incidents are possible, and what HSE impacts would result. One method to assist with the hazard identification process is to check whether any items retain “potential” and can be thought of in terms of a source of energy that can be released.

The types of stored energy should be listed as hazards. This includes:

- Gravity and acceleration energy;
- Electrical energy;
- Mechanical energy;
- Chemical energy;
- Environmental energy;
- Thermal energy;
- Pressure energy;
- Noise and vibration energy;
- Explosive energy;
- Human and muscle energy; and
- Biological energy.

An example of this approach is the storage of chemicals; these contain ‘chemical energy’ that can be released by loss of containment. Ongoing emissions to air, water and land may contain chemical energy as well as thermal energy. Many activities contain ‘mechanical energy’ such as engines running.

Once the hazards have been identified, the next step is to determine the incidents that could result if the energy potential from the hazard was realised and trigger a HSE consequence.

A single hazard may have the potential to lead to one of a number of incidents or responses, and each could result from several possible faults. All of these should be considered and assessed.

The resulting output from the hazard analysis step should be a list of all identified hazards, and the potential incidents and outcomes that may occur due to the realisation of each hazard.

4.3 Step Three - Analyse Risks

The risk is determined by combining the consequence and likelihood terms.

a) Analysing the potential consequences

Involves identifying the most probable consequence that is likely to occur should the full energy potential from the hazard be realised. Consequences must be considered for the effects to people, the environment, the community, or plant and property. The outcomes must be realistic and distinctly possible.

b) Determining likelihood

Involves estimating the likelihood of the determined consequence actually occurring. It is most important to relate the probability of an event actually occurring to a history of known or similar events having taken place either at the site or elsewhere in the world this is why experienced personnel must be consulted during the process.

A qualitative analysis uses descriptive terms such as:

- Almost certain;
- Likely;
- Possible;
- Unlikely; or
- Rare.

Use of a chart such as the one shown in Table 1 - Risk Assessment Process can assist the risk assessment team to make qualitative judgements.

Risk Assessment Process		
Step 1 Determine Consequence		Step 2 Determine Likelihood
People Consequences	Plant, Property, Productivity Environmental Consequences	Likelihood
Catastrophic Death	More Than $5,000,000 Damage, Large Reorganisation of Project, Major Environmental Damage	Almost Certain Common or Frequent Occurrence
Major Lost Time Injury or illness	$500,000 - $5,000,000 Damage, Project Contingency Plan Required, Off Site Release with no detrimental effects	Likely Is Known To Occur or "It has happened recently"
Moderate Medical Treatment Injury or Illness	$50,000-$500,000 Damage, Production Disruption, On Site Release contained with outside assistance	Possible Could Occur or I've Heard of It Happening in the last year
Minor First Aid Injury	$5,000-$50,000 Damage, Slight Production Disruption, On Site Release immediately contained	Unlikely Not Likely To Occur "I haven't heard of it happening"
Insignificant No Injury	Under $5,000 Damage, Minimal Productivity Disruption, No Environmental Impact	Rare Conceivable but Practically Impossible

Table 1 - Risk Assessment Process

Estimating risk involves combining the severity of the consequence (and impacts / effects) resulting from the potential incident and the likelihood or frequency of that consequence.

For a qualitative analysis, the Risk Matrix provided below in Table 2 - Consequence Severity Matrix shall be used to rank the risk. The risk is ranked as either:

- Low;
- Moderate;
- High; or
- Extreme.

Consequence Severity Matrix					
Likelihood or Frequency	Consequence Severity				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	High	High	Extreme	Extreme	Extreme
Likely	Moderate	High	High	Extreme	Extreme
Possible	Low	Moderate	High	Extreme	Extreme
Unlikely	Low	Low	Moderate	High	Extreme
Rare	Low	Low	Moderate	High	High

Table 2 - Consequence Severity Matrix

4.4 Step Four - Evaluate Risks

The risk evaluation step determines the tolerability of the risk. This is done by comparing the assessed HSEC risk (outlined in Step 3) with the criteria for Calsta tolerability

The 'ALARP' principle shall be used to assess the tolerability of a risk. It includes the criteria against which tolerability can be determined.

Note the risk evaluation shall also establish the overall risk associated with multiple issues. For instance, minor issues associated with a particular task or project, whilst not significant in themselves on a stand-alone basis, may combine and result in an overall cumulative higher risk.

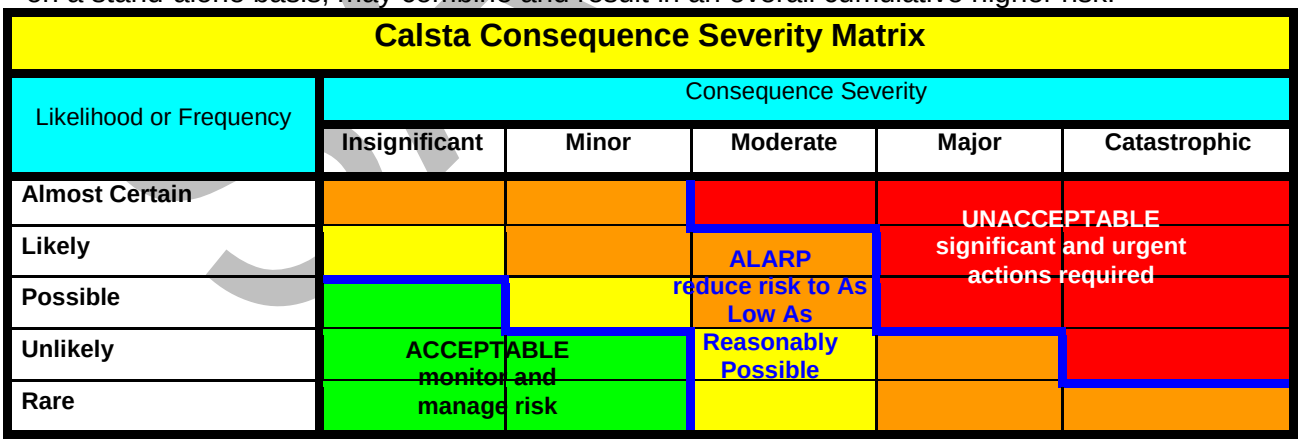

Table 3 - ALARP Principle Applied to Severity

4.5 Step Five - Decision on the Tolerability of Risks

Once the risk has been assessed against the defined tolerability criteria, a decision can then be made to either:

- Tolerate the risk if it is ALARP; or
- Consider treatment options if the risk does not fall within the tolerable range

Note: if a risk is 'ACCEPTABLE', it requires ongoing management and monitoring, and management procedures shall be developed to ensure that it remains in this risk category.

This decision making process should be consistent and repeatable. The decision on risk tolerability is one made by Calsta management based upon risk versus benefits. However, a risk that rates as 'Extreme' (using the risk matrix), falls into the 'UNACCEPTABLE' zone. Hence, treatment options need to be applied to these risks to bring them down to an ALARP level.

Also note there will be circumstances where some risks cannot be reduced to an ALARP level in the short term. The tolerability of these risks and appropriate treatment controls need to be assessed on a case-by-case basis, and shall be referred to the Calsta Manager for approval. These risks require temporary or longer-term modifications or activities may even be shutdown. These risks cannot be accepted as tolerable long-term risk.

4.6 Step Six - Treat Risks

Where treatment options are required, input shall be sought from a broad range of experienced personnel to develop workable solutions. The aim in treating the risk is to bring it to a level that is tolerable or ALARP. This involves:

- Identifying, evaluating and selecting potential treatment options following the Hierarchy of Controls, shown in Figure 1 - Hierarchy of Controls;
- Undertaking cost / benefit assessments;
- Preparing and implementing treatment plans;
- Reassessing the 'residual risk' to see if it is ALARP (run through the risk management process again), and continuing to monitor it.

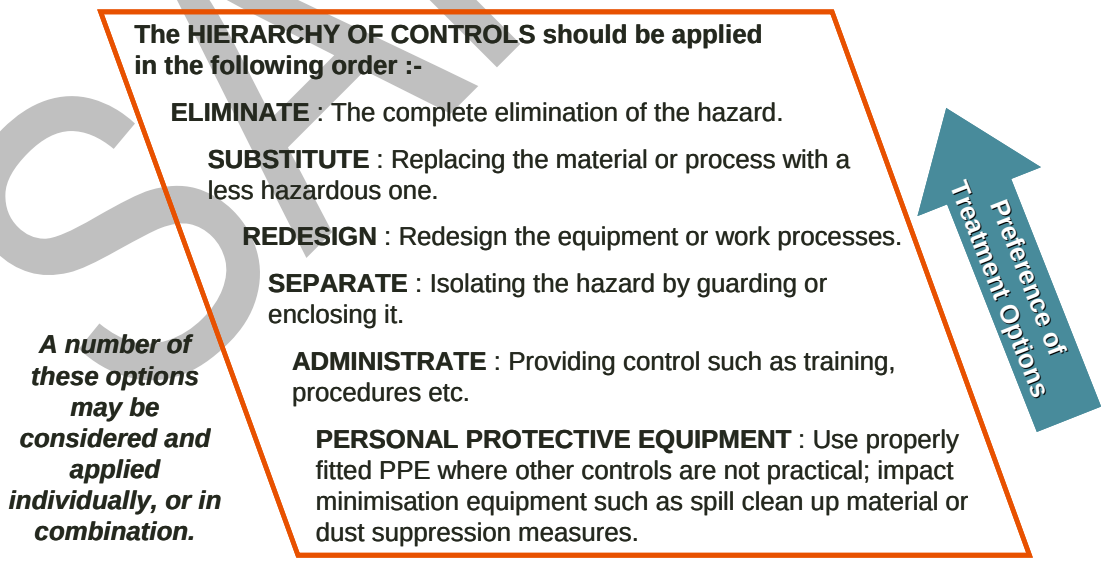

Figure 1 - Hierarchy of Controls

4.7 Step Seven - Monitor and Review

Monitoring and review needs to be undertaken at each step in the risk management process. The process may need to be repeated if there are significant changes in the original context (eg, changes in the process, equipment, people, legislation, or community expectations). The risk profile of activities are dynamic and will change. Due to this, the risk management process and its outcome shall be reviewed at regular intervals.

A significant and important component of monitoring risks is the development and maintenance of a risk register. Application of the risk assessment process described within this Procedure will produce the necessary information to include in the Calsta database. All completed and approved risk assessments shall be entered into the Calsta System.

5 PERFORMING A JOB SAFETY ANALYSIS

Step 1	**SELECT THE JOB TO BE ANALYSED**		
	▪ Identify exactly what you're going to be doing, and if the job is too big, you may have to break it into smaller JSA's for each step.		
Step 2	**COMPLETE THE IDENTIFICATION DETAILS ON THE JSA FORM**		
	▪ Date ▪ Job description ▪ Equipment name and number ▪ Area ▪ JSA Team details – name & signature		
Step 3	**BREAK THE JOB DOWN INTO A LOGICAL SEQUENCE OF STEPS**		
	▪ Look at the whole job and break it down ▪ 10 - 12 simple steps ▪ Record the logical sequence that they are performed in		
Step 4	**IDENTIFY THE HAZARDS AT EACH STEP**		
	Physical Hazards	**Mechanisms Of Injury**	**Other Considerations**
	Pressure Electricity Chemicals Rotating machine parts Vehicles Heights Confined Spaces Vibration Access Moving Objects Weather Hot/Cold objects Noise Radiation Weight of objects	Struck by Caught In / On Strain / Over exertion Dropped objects Strike against Slip / Trip / Fall Inhalation Fire / Explosion Exposure to Gas /Heat / Fumes / Dust / Chemicals	Damage to the environment Damage to equipment Human Factors – competency / training / fitness / fatigue Simultaneous operations Fellow employees Travel to and from the Workplace

Step 5	**IDENTIFY THE POSITION, SKILLS, ADDITIONAL PPE, TOOLS & EQUIPMENT REQUIRED AT EACH STEP**
	▪ Examine each step, and list: ▪ Who should be doing the job eg? Tradesperson, Apprentice, Manager etc. ▪ What skills are required eg? EWP certificate, Welding ▪ Extra PPE requirements eg. Respirator, Fall arrest harness ▪ Equipment required eg. Over head crane, Chains & SWL
Step 6	**IDENTIFY THE PERSONAL ISOLATION OR PERMIT REQUIREMENTS**
	Identify the isolation points and/or permits. ▪ Remember: Electrical, Air, Water, Reagents etc isolations ▪ Consider the need for: Hot work, Confined Space, etc
Step 7	**ASSESS THE RISK USING THE CONSEQUENCE SEVERITY MATRIX**
Step 8	**DETERMINE THE CONTROL MEASURES THAT WILL OVERCOME THE HAZARDS**
	Consider, in this order: ▪ Eliminate the problem, and substitute a lesser process or chemical ▪ Engineer out the problem eg. guards, locks, chains, cradle, scaffolding etc ▪ Procedures eg. rotate team, restrict access or entry, regular testing etc ▪ Wear effective PPE
Step 9	**RECORD THE RESULTS**
	▪ Discuss hazards and solutions within the JSA Team, and write down the agreed ▪ way that the job will be done ▪ Record the Risk Rating for each hazard after the controls have been put in place.
Step 10	**REVIEW STEPS AND RECORD THE FINAL RISK RATING**
	The Team reviews the JSA - ▪ Is it practical? Reasonable? Are there the resources to do the job? ▪ Calculate the final risk rating for the whole job as per the Risk rating matrix.
Step 11	**GET IT APPROVED BY A RESPONSIBLE PERSON**
	A responsible / knowledgeable person must approve all JSA's before the job starts. The Team Leader/Superintendent etc must sign the JSA form.

6 REFERENCE DOCUMENTS

CPL_PCR_Risk_Management - Risk Management Procedure
CPL_FRM_Job_Safety_Analysis - Job Safety Analysis Form