



MSW Hazard Analysis – JO Standardized OE Procedure

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Hazard Analysis

1.0 Purpose and Objectives

The purpose of this procedure is to ensure Hazard Analysis is used for the effective identification, mitigation, control and communication of hazards.

This procedure establishes requirements for hazard analysis. The objective of Hazard Analysis is to ensure proper consideration is given to the risks associated with completing a particular task. This procedure follows the three phases of Hazard Analysis, as it applies to our work; consisting of three specific activities that are recognized as separate, but complementary components of the Managing Safe Work (MSW) Process:

- Planning Phase Hazard Analysis;
- Job Safety Analysis (JSA); and the
- Personal Hazard Assessment

NOTE: Each upstream and gas strategic business unit (JO) or location may have additional regulatory requirements.

1.1 Scope

This Hazard Analysis Procedure covers work performed by Chevron employees and their delegates and contractors within Chevron Upstream and Gas (JO) operational control.

Operational Excellence reporting boundary definitions can be found in the [OE Data Reporting Standard](#). For contractor activities where Chevron does not have operational control, Chevron will encourage contractors to use hazard analysis tools.

This procedure does not apply to Facilities and Operations HES design reviews, Integrated Hazard Identification's, or other risk assessment studies as defined in the Corporate OE Standard Process – HES Risk Management.

1.2 Requirements

To comply with this procedure, JOs will meet the following requirements:

1. A hazard analysis appropriate to the phase of work shall be conducted.
2. A hazard analysis must consider actions as well as physical and environmental conditions.
3. Personnel performing hazard analysis shall be trained and competent in the roles for which they are responsible.
4. All JSAs must be developed or revised onsite by the personnel performing the work to ensure the systematic identification and mitigation of site-specific hazards before work begins.
5. A Job Safety Analysis (JSA) used onsite by an individual work crew shall address specific tasks.
6. Content of the JSA must be communicated to the work team and other affected parties immediately prior to beginning work. Communication must occur in a language appropriate for the work team so that they clearly understand the task hazards, control measures and actions required to conduct the work safely.
7. Individuals must perform a Personal Hazard Assessment before starting a work task.

1.3 Terms and Definitions

The following terms and definitions apply to the JO – Hazard Analysis Procedure:

JO Hazard Identification Tool - A tool to help persons while developing or reviewing a hazard analysis or JSA, or while conducting a Personal Hazard Assessment, to identify energy sources present in the work environment which may present potential hazards if released in an unplanned manner, or contacted in an unwanted way.

Hazard - A condition or action that has the potential for an unplanned release of, or unwanted contact with, an energy source that may result in harm or injury to people, property or the environment.

Hazard Analysis - A process used to assess and mitigate risks. It focuses on the relationship between the worker, the task, the tools, and the work environment.

Operating Procedure (OP) – An OP that includes a review equivalent to a hazard analysis that may be used as the planning phase hazard analysis for work. The OP must meet specific standards to ensure the required level of hazard and mitigation review has occurred.

Planning Phase Hazard Analysis – A hazard analysis usually conducted remotely by project management and subject matter experts, based on process and operational documentation and knowledge.

Job Safety Analysis - The JSA is a tool for analyzing a task. This on-site, site-specific, hazard analysis may be based on a review of planning phase hazard analyses, a Qualified Standard Operating Procedure (QSOP), or a previously developed JSA for the same task, if available.

Personal Hazard Assessment - A Personal Hazard Assessment is a self-assessment that provides an opportunity for the individual worker to focus on a task and ensure they are prepared to perform it safely. It is typically a reflective exercise undertaken to help each worker understand his or her responsibility for health and safety.

Risk Assessment - A qualitative or quantitative procedure that evaluates: what can fail or go wrong; the consequences of each event; the likelihood of each event occurring; and how the severity and likelihood combine to give an overall statement of risk.

Task - A task is a sequence of steps or activities to complete the work. Tasks are identified and evaluated to the appropriate level of detail.

Think Incident Free (TIF) – A tool that can be used by anyone in the workplace to identify hazards and unsafe behaviors and then make a plan to performing work without incident. Four points to consider for working safely are planning, state of mind, training and proper tools and equipment.

1.4 Roles, Responsibilities and Training Requirements

There must be clearly defined roles, and personnel must meet the training requirements of this procedure prior to starting work.

The following roles are specific to Hazard Analysis:

- Participant/User
- Facilitator

A single individual may fulfill more than one role as long as he or she meets the competency requirements and is able to fully meet multiple responsibilities. When selecting personnel for these positions, consideration should be given to the candidate's level of experience and past performance.

1.4.1 Initial Training

Personnel must meet the initial training requirements of this procedure prior to starting work. Refer to the [JO – Training Requirements Tool](#).

JOs are encouraged to adapt standard training material as needed to address local procedures.

- Hazard Identification Tool
- Job Safety Analysis (JSA)
- Personal Hazard Assessment

A recommended on-site JSA competency development model based on training, field observations and coaching can be found in [Appendix F](#).

2.0 Standard Instructions

This procedure follows the three phases of hazard analysis as it applies to work. From the initial planning phase, to the onsite Job Safety Analysis (JSA), to the individual worker's Personal Hazard Assessment. Hazard analysis is critical to identifying potential hazards and developing actions and strategies to prevent incidents from occurring. Hazard analyses may also be used as a training tool for new employees, as the basis for health, environment and safety (HES) checklists, behavior based safety (BBS) observations and safety meeting topics, and to write HES standards and standard operating procedures (SOPs) for new or modified jobs. An example of a form for completing the Planning Phase Hazard Analysis, and subsequently the JSA can be found in [Appendix A](#).

Table 1. **Summary of Hazard Analysis Methods**

Analysis Method	When to use	Intent	Format
Planning Phase Hazard Analysis (e.g. Risk Assessment, Job Hazard Analysis, Safety Plan, Safety Instruction, QSOP)	During the planning phase of work: pre-work, project planning, design reviews, execution plan development	To identify anticipated hazards and plan mitigations To ensure that the right number of people, skill sets, equipment and PPE are included in the plan To identify the types of permits required to do the work To identify the SWP standards and SOPs applicable to the work For use as starting point for onsite JSA	The format must be consistent with the level of risk posed by the task, as determined by the JO. For low-risk work, could be an unwritten review of a generic (library) safety plan, QSOP, operator checklist, or other form of hazard analysis; for all other work, must be a documented hazard analysis as described in the standard instructions.
Job Safety Analysis (JSA)	During the onsite preparation/permitting/execution phase of work: prior to start of work	To involve the work team to make sure that the people doing the work understand the tasks, hazards and mitigations To address onsite conditions on the day of the work	Typically a formal written JSA meeting the elements of the standard instructions, for work not clearly identified by the JO as low-risk. For low-risk work, may be an unwritten JSA, job site discussion, or a Personal Hazard Assessment, as

Analysis Method	When to use	Intent	Format
		To identify mitigation measures, and assign responsible to verify they are in place To verify that work team has proper skill level and tools to complete the job safely	determined by the JO.
Personal Hazard Assessment (e.g. Think Incident-Free (TIF), Personal Safety Plan, Stop, Think, Go)	Anytime, including during the course of performing the work	To prompt workers to think before they act To ensure that the worker is looking for hazards while they are doing work To support Stop Work Authority and the Tenets of Operation	This is typically an unwritten self-assessment done as a reflective mental exercise by each worker immediately prior to beginning his or her specific activities. For low risk work, this may be the only hazard analysis conducted.

2.1 Performing a Planning Phase Hazard Analysis

A planning phase hazard analysis involves the following activities:

- Identifying the task
- Forming the team (for simple tasks, this may be one person)
- Breaking down the task into steps
- Identifying potential hazards
- Developing control measures to mitigate the identified hazards
- Conducting risk ranking (Optional)

Note: Information on conducting a Risk Assessment can be found in Appendix B.

2.1.1 Identifying the Task

A task is a sequence of steps or activities to complete the work. Tasks are identified and evaluated to the appropriate level of detail. “Drilling a well” or “performing a shutdown on a gas plant” is too broad to be a single task, and tasks such as “turning on a switch” are too narrow for effective analysis. The appropriate level of detail for a task is typically the type of assignments that a supervisor would make (e.g., removing a pump for maintenance, collecting an oil sample from a vessel, or installing a blind in piping).

In the planning phase for a large scope of work (e.g., capital project), the hazard analysis may consist of a single assessment covering many tasks.

2.1.2 Forming the Analysis Team

Person(s) performing the analysis should:

- Be experienced and knowledgeable about the task and hazards
- Understand the hazard analysis procedure
- Be an experienced facilitator, if appropriate

When forming the team, consider factors such as the complexity of the task, the location of the work and the size of the workgroup. In addition to the person doing the job, team members should be selected as appropriate and may include other workers, supervisors and HES professionals. If the hazard analysis is being prepared for a task that will require a permit, the team should include participation by the Area Controller and Work Team Leader who will be involved in the permitting. In some cases, it may be acceptable for an analysis to be prepared by one person.

The planning phase hazard analysis may be initiated in an office setting, and be based primarily on facility and process knowledge and documentation reviews; however, information obtained from site visits by the person conducting the hazard analysis may provide a more complete analysis.

2.1.3 Breaking-down the Task

Before the search for potential hazards begins, the task is broken down into a sequence of events consisting of the major steps, with each step describing what is being done. Begin by asking, “What step starts the task?” then, “What is the next basic step?” and so on. If too many steps result from the analysis (over 15), consider breaking that job into more than one task.

When beginning to document the analysis, describe and number each step on the analysis form. Each step tells **what** is done, not how. The description for each step should begin with an action word such as “remove,” “climb,” “open” or “weld.” The description of the step is completed by naming the item to which the action applies, for example, “remove extinguisher,” or “carry to fire.”

Check the breakdown of the steps with other team members, particularly someone who is knowledgeable about performing the task. Obtain agreement on the description of what is done and the order of the steps.

2.1.4 Identifying Potential Hazards

Once the basic steps have been determined, begin the search for potential and existing hazards.

Look at physical conditions (chemicals, tools, work space, etc.), environmental factors (heat, cold, noise, lighting, weather conditions, etc.) and actions or behaviors (need to stand on a slippery or unstable surface, extended reach to operate a valve, lifting bulky objects).

Additional information on increasing hazard identification skills is located in the [MSW Support Materials](#).

An example of identifying hazards using the Chevron Hazard Identification Tool can be found incorporated into the form in [Appendix A](#).

2.1.5 Developing Control Measures

The next step in a hazard analysis is to identify control measures, which exist, or should be put in place, in order to eliminate potential hazards, or mitigate them to an acceptable level of risk. Identifying control measures for each hazard, even those already controlled will facilitate understanding and communication. The principal control measures detailed below represent a hierarchy (order of preference) in which they should be considered:

- Determine if the work is necessary - eliminate unnecessary work that adds risk and does not contribute to achieving the desired result.
- Change the physical conditions that create the hazards – change in tools, materials, equipment, layout or location. This is the preferred approach until there is general agreement that work conditions are as safe as reasonably practical.

- Change the work procedure – ask, “What should the employee do, or not do, to eliminate this particular hazard or prevent this potential accident?” The answer might be as simple as standing to the side when opening the valve, or getting a good stance before lifting an item.
- Add barriers between the hazard and the receptors – fire blankets, warning tape, personal protective equipment (PPE), etc.
- Find a completely new way to do the job – if the above steps have not yielded a safe, efficient way to perform the task, and then look at the task itself. Determine the goal of the job and analyze alternative ways of reaching this goal.

Control measures should be stated so that people clearly understand what to do. There is usually not enough space on the assessment form to explain how to do it. The needed level of detail should be included in procedures, manuals, employee training, or in some other form so that everyone understands how to do the task safely.

NOTE: Identifying associated procedures (when/ where applicable) is a viable mitigation when incorporated by review and thorough understanding of individuals involved in job task planning.

2.2 Perform an On-site JSA

2.2.1 Introduction

The Job Safety Analysis (JSA) is the final part of analyzing a task prior to starting job. This analysis occurs at the work site prior to work beginning, and involves those individuals doing the work and communication with those that may be affected. The JSA is performed because the planning phase hazard analysis may not always identify onsite or working environment hazards, as they may not always be apparent or realized during the planning process. For example:

- Other activities in the same location may require additional controls related to communication or safety barriers
- Environmental factors e.g. wind speed and direction may have an additional impact on the work
- Technical aspects of the job may introduce additional hazards that require onsite changes to be considered. These additional hazards should be assessed using the same method as previously used in the planning phase hazard analysis process
- Other affected and/or knowledgeable persons may identify additional hazards

2.2.2 Completing an on-site JSA involves the following activities:

- For work determined to be low-risk, workers may use an unwritten hazard analysis, Personal Hazard Assessment, job site discussion, or other undocumented hazard analysis method.
- For work not determined to be low-risk, completion of a written JSA form with the following elements:
 - Title and summary description of the task(s) to be performed
 - The Name of the person leading the work, the work location, permit #(s) and date
 - A list of the steps required to accomplish the task(s)
 - A list of potential hazards associated with each step
 - A list of controls or mitigations for each potential hazard
 - Acknowledgement of understanding by each member of the work team through signature on the form

- A risk assessment for each step (optional)
Note: Information on conducting a Risk Assessment can be found in [Appendix B](#).
- Conducting an Onsite Briefing/Toolbox Talk prior to commencing the work, to ensure that the work team is aware of the hazards and control requirements. The onsite pre-job briefing should be carried out by the Work Team Leader and include the following:
 - Reviewing the JSA with the work team and other potentially affected persons
 - Assessing any additional hazards at the worksite
 - Ensure the appropriate control measures are in place
 - Assign responsibility to ensure control measures are in place
 - Emphasize the use of Stop Work Authority (SWA), and identify and discuss examples of actions or conditions which might lead to use of SWA during this job
 - Confirm work-party understanding
 - Obtain the signatures of all the work-party on the JSA documentation
- Conducting additional reviews if:
 - Job scope changes significantly
 - New personnel are added to the work party
 - Site conditions change beyond those originally identified
 - A near miss, incident, or other work stoppage occurs
 - A concern is raised as the result of a Personal Hazard Assessment
- Following the work, reviewing the activity and agreeing lessons learned for continual improvement;
- Document lessons learned and update planning phase hazard analyses, SOPs, etc. for future use.

2.3 Performing a Personal Hazard Assessment

Each individual should perform a Personal Hazard Assessment prior to beginning work tasks, and regularly reassess the work environment. Personal Hazard Assessments encourage individual employees to reflect on, and take ownership of identifying and ensuring controls are in place for the hazards to which they may be exposed.

The minimum steps of an effective [Personal Hazard Assessment](#) are:

- Understanding the method to perform the task safely
 - Determining the potential hazards
 - Determining what can be done to eliminate the hazard
 - Acting to prevent any negative consequences
 - JOs may use a variety of tools to support their Personal Hazard Assessments.
- [Appendix E](#) contains an example of a Personal Hazard Assessment using the Think Incident Free (TIF) tool.

2.4 Monitoring Effectiveness

2.4.1 Planning Phase HA Document Reviews

Planning Phase Hazard Analyses often form the basis for subsequent on-site JSAs, as well as the hazard analyses incorporated into QSOPs, therefore, JOs should consider assigning responsibility to validate they are prepared correctly, this procedure is followed, and that the results are clearly communicated to stakeholders.

A potential option designed to help ensure these hazard analyses are completed effectively can be found in the example [Hazard Analysis Team Charter](#).

These HA document reviews should be initiated and completed as defined in the JO verification matrix. HA reviews should be documented and submitted to the JO designated location, for review by the JO Process Sponsor and Advisor or designee.

2.4.2 JSA Document Reviews

JSA document reviews will be used periodically (as determined by the JO) by Supervisors and the MSW Process Sponsor/Advisor to provide evidence of consistency in developing effective JSAs. Note: The onsite JSA documents are only one aspect of the JSA process, and these reviews may not provide insight into the communication of the JSA or any pre-job briefings/discussions that may have been conducted. Results of the document reviews should be regularly communicated to the workforce to provide for continuous improvement.

2.4.3 JSA Observation Reviews

As part of the recommended competency development activity, regular reviews of the findings of JSA field observations should be performed and communicated to Supervisors and the MSW Process Sponsor/Advisor to provide evidence of consistency and effectiveness of communication of JSAs. Results of the observation reviews should be communicated to the workforce.

3.0 Records

3.1 Required Records

The following records will be kept:

- Copies of Planning Phase Hazard Analyses, JSAs and other associated documentation should be maintained as defined by the JO.

3.2 Retention Requirements

In order to facilitate the review process and improve the quality of assessments, hazard analyses should be retained at an JO designated location for one year or as otherwise defined by the JO.

4.0 Document Control Information

Table 2. Document Control

Description	JO Common	JO Specific
Approval Date	01 October 2011	
Next Approval Due	February 2012	
Control Number		

4.1 Document Change History

Changes to this document are listed in the table below in reverse order by change date.

Table 3. Document Change History

Date	Revision Number	Description of Change
27 February 2008	1.0	Initial release of Global Upstream process
30 May 2008	1.1	Add link to hazard Analysis Risk Matrix
8 December 2008	1.2	Added bookmarks for OE Mentor
01 October 2011	1.3	Added language clarification and made formatting changes
11 November 2011	1.4	Updated to new JO template
01 June 2012	1.5	Updated to include Corporate Required MSW Process Requirements



5.0 Document List

This is a complete list of the documents referenced in this process.

Table 4. Document List

Procedure/Attachment Title	File Name
OE Data Reporting Standard	OE Data Reporting Standard
JO Training Requirements Tool	JO_TrainingRequirementsTool.doc
JO SWA Procedure	JO_StopworkAuthorityProcedure.doc
Example Hazard Analysis Team Charter	Hazard Analysis Team Charter.
MSW Process Flow Diagram	MSW Process Flow Diagram
Hazard Identification Tool	Hazard Identification Tool

Appendix A: Standard Hazard Analysis Worksheet with Risk Assessment

	<h3>Planning Phase Hazard Analysis</h3>			
DATE:	ACTIVITY TITLE:			
DESCRIPTION OF WORK:				
ORIGINATOR:	HA REF#			
Part A - IDENTIFY POTENTIAL HAZARDS FOR THE JOB				
Hazardous Energies List & Examples (Review the job steps and identify any of the following hazards that are applicable)		Hierarchy of Controls <ul style="list-style-type: none"> • Remove • Prevent Release • Protect from Release • Stop Work Authority 		
Electrical <input type="checkbox"/> Power Lines / Transformers <input type="checkbox"/> Static Charges / Lightning <input type="checkbox"/> Energized Equipment <input type="checkbox"/> Wiring <input type="checkbox"/> Batteries Temperature <input type="checkbox"/> Open Flame <input type="checkbox"/> Ignition Sources <input type="checkbox"/> Hot or Cold surfaces <input type="checkbox"/> Hot or old Liquids or gases <input type="checkbox"/> Steam <input type="checkbox"/> Friction <input type="checkbox"/> Weather Conditions Sound <input type="checkbox"/> Equipment Noise <input type="checkbox"/> Vibration <input type="checkbox"/> Impact Noise <input type="checkbox"/> High- Pressure Relief <input type="checkbox"/> Impact on Communication	Mechanical <input type="checkbox"/> Motors <input type="checkbox"/> Rotating Equipment <input type="checkbox"/> Drive belts / conveyers <input type="checkbox"/> Compressed springs Motion <input type="checkbox"/> Motor Vehicles / Vessels <input type="checkbox"/> Equipment Movement <input type="checkbox"/> Flowing Water <input type="checkbox"/> Wind <input type="checkbox"/> Body Position, Lifting, Standing, Bending Pressure (high/low) <input type="checkbox"/> Compressed Cylinders <input type="checkbox"/> Control Lines <input type="checkbox"/> Hoses <input type="checkbox"/> Piping <input type="checkbox"/> Pneumatic / Hydraulic <input type="checkbox"/> Tanks / Vessels	Radiation <input type="checkbox"/> Lighting Issues <input type="checkbox"/> Welding Arc <input type="checkbox"/> X-rays (sources) <input type="checkbox"/> Solar Rays <input type="checkbox"/> NORM <input type="checkbox"/> Microwaves <input type="checkbox"/> Lasers Chemical <input type="checkbox"/> Inert gas / Low / High Oxygen <input type="checkbox"/> Combustibles <input type="checkbox"/> Asbestos <input type="checkbox"/> Hydrocarbon /Gas Release <input type="checkbox"/> Corrosives <input type="checkbox"/> Flammable explosive vapors <input type="checkbox"/> Vapor/Dust / Fumes/ Exhausts <input type="checkbox"/> Pyrophorics <input type="checkbox"/> Reactive hazards <input type="checkbox"/> Carcinogens or toxics	Gravity <input type="checkbox"/> Falling Objects <input type="checkbox"/> Roof /Earth collapse <input type="checkbox"/> Body Tripping or Falling Biological <input type="checkbox"/> Insects / Animals <input type="checkbox"/> Bacteria <input type="checkbox"/> Viruses <input type="checkbox"/> Blood Borne Pathogens <input type="checkbox"/> Contaminated Water <input type="checkbox"/> Improper Food Handling System / Other <input type="checkbox"/> Lone Worker <input type="checkbox"/> Protected Sites <input type="checkbox"/> Restricted Access/Egress	High Risk Categories <input type="checkbox"/> Working at Heights <input type="checkbox"/> Fire/Explosion <input type="checkbox"/> Mobile Equipment <input type="checkbox"/> Confined Space <input type="checkbox"/> Access/ Egress <input type="checkbox"/> Isolation of Hazardous Energy <input type="checkbox"/> Lifting and Rigging <input type="checkbox"/> Hot Work <input type="checkbox"/> Excavation <input type="checkbox"/> Fit for Duty

Form No.:

Name: Hazard Analysis Form

Date of Last Revision: 15 July 2010
Revision ID: 1

Page: 1 of 4

Appendix A: Standard Hazard Analysis Worksheet with Risk Assessment (Page 2)

NO	MAJOR STEPS OF JOB /TASKS (Sequence of Events)	POTENTIAL/ASSOCIATED HAZARD Note Energy Source (Refer to Checklist Part A)	HAZARD CONTROL MEASURES	Residual Risk Rating	Control action by:
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
Part B - APPROVAL					
HA Team Leader		Print Name:		Signed:	Date:
Chevron Representative		Print Name:		Signed:	Date:
Permit Holder		Print Name:		Signed:	Date:

Appendix A: Standard Hazard Analysis Worksheet with Risk Assessment (Page 3)

Part C – JOB SAFETY ANALYSIS - APPLICATION AT THE WORKSITE/WORKSITE REVIEW					
ONSITE CHANGE IDENTIFICATION				YES	NO
A	WILL NEW TOOLS, DIFFERENT TECHNIQUES OR OTHER PROCEDURES BE USED TO EXECUTE THE JOB?				
B	ARE ADDITIONAL TASKS REQUIRED?				
C	DOES THE WORK AREA HAVE DIFFERENT CONDITIONS FROM THE SOP AND/OR THE LANNING PHASE HA?				
D	DOES THE PROCESS CONDITIONS GENERATE ADDITIONAL RISKS BESIDES THOSE IDENTIFIED IN THE PLANNING PHASE HA?				
E	ARE THERE ANY ADVERSE WEATHER CONDITIONS (E.G.WIND, RAIN ETC)?				
F	OTHER: SPECIFY				
SITE HAZARD IDENTIFICATION ASSOCIATED WITH CHANGE OR SCOPE AND CONDITIONS:					
STEP NO	ADDITIONAL STEP SEQUENCE (IF APPLICABLE)	HAZARD DESCRIPTION	HAZARD CONTROL MEASURES	RESIDUAL RISK	

Appendix A: Standard Hazard Analysis Worksheet with Risk Assessment (Page 4)


ALL PERSONNEL INVOLVED IN THE CREATION AND/OR REVIEW OF THE JSA SHALL ENTER THEIR NAMES BELOW AND SIGN TO CONFIRM THEY HAVE BEEN INVOLVED IN DEVELOPMENT, READ AND UNDERSTOOD THE CONDITIONS OF THE HA/JSA. THE WORK PARTY LEADER MUST ENSURE ALL NAMES AND SIGNATURES ARE OBTAINED.							
	NAME	SIGN	Date		NAME	SIGN	Date
1				11			
2				12			
3				13			
4				14			
5				15			
6				16			
7				17			
8				18			
9				19			
10				20			
FEEDBACK/LESSONS LEARNED: 							
COMMENTS: 							

Appendix B: Risk Assessment

An additional step that may be included in a hazard analysis is an assessment of the risk associated with each job step. Control measures are intended to either eliminate the risk of the job (task) or reduce it to an acceptable level. Using an approved Risk Matrix as shown on the next page, each hazard identified in a planning phase hazard analysis or in a JSA is assessed for the risk before any control measures are applied.

Once the control measures are applied, the Risk Matrix is used to determine the potential severity and the likelihood of the risk for each step in the job, which leads to a residual risk ranking code of Low, Medium or High (L, M, and H). The consequence effect from a hazard does not normally change through the implementation of a control, only the likelihood of the consequence occurring. Where residual risk is determined to be acceptable and as low as reasonably practicable, the work may continue based on agreement from the hazard analysis team. If the residual risk is too high then the work should be scheduled for an alternate time when the risk can be adequately controlled.

Appendix C: Risk Ranking Matrix (4x4)

Likelihood Descriptions		Likelihood Indices		Risk Matrix			
Consequences can reasonably be expected to occur in life of facility	1	Likely	 Decreasing Likelihood	M	M	H	H
Conditions may allow the consequences to occur at the facility during its lifetime, or the event has occurred within the Business Unit	2	Occasional		L	M	M	H
Exceptional conditions may allow consequences to occur within the facility lifetime, or has occurred within the OPCO	3	Seldom		L	L	M	M
Reasonable to expect that the consequences will not occur at this facility. Has occurred several times in the industry, but not in the OPCO	4	Unlikely		L	L	L	M
Consequence Indices				Decreasing Consequence/Impact			
				D	C	B	A
				Incidental	Minor	Moderate	Major
Consequence Descriptions	Safety		Workforce: Minor injury such as a first-aid. AND Public: No Impact	Workforce: One or more injuries, not severe. OR Public: One or more minor injuries such as a first-aid.	Workforce: One or more severe injuries including permanently disabling injuries. OR Public: One or more injuries, not severe.	Workforce: (1-4) Fatalities OR Public: One or more severe injuries including permanently disabling injuries.	
	Health (Adverse effects resulting from chronic chemical or physical exposures or exposure to biological agents)		Workforce: Minor illness or effect with limited or no impacts on ability to function and treatment is very limited or not necessary AND Public: No Impact	Workforce: Mild to moderate illness or effect with some treatment and/or functional impairment but is medically manageable OR Public: Illness or adverse effect with limited or no impacts on ability to function and medical treatment is limited or not necessary.	Workforce: Serious illness or severe adverse health effect requiring a high level of medical treatment or management OR Public: Illness or adverse effects with mild to moderate functional impairment requiring medical treatment.	Workforce (1-4): Serious illness or chronic exposure resulting in fatality or significant life shortening effects OR Public: Serious illness or severe adverse health effect requiring a high level of medical treatment or management.	
	Environment		Impacts such as localized or short term effects on habitat, species or environmental media.	Impacts such as localized, long term degradation of sensitive habitat or widespread, short-term impacts to habitat, species or environmental media	Impacts such as localized but irreversible habitat loss or widespread, long-term effects on habitat, species or environmental media	Impacts such as significant, widespread and persistent changes in habitat, species or environmental media (e.g. widespread habitat degradation).	

Appendix D: Chevron Hazard Identification Tool

Hazard identification tools provide a structured approach for identifying hazards and may provide assistance when creating a hazard analysis.

The Chevron [Hazard Identification Tool](#) is based on first identifying energy sources in the workplace, which if contacted in an unwanted way or released in an unplanned manner can pose a hazard. Look at physical conditions (chemicals, tools, stored pressure, elevation, etc.), environmental factors (heat, cold, noise, lighting, wet conditions, etc.) and actions or behaviors (equipment or personnel movement, etc.). Identify all energy sources associated with each step regardless of the level of control present, and then identify potential hazards based on unwanted contact or an unplanned release of energy.



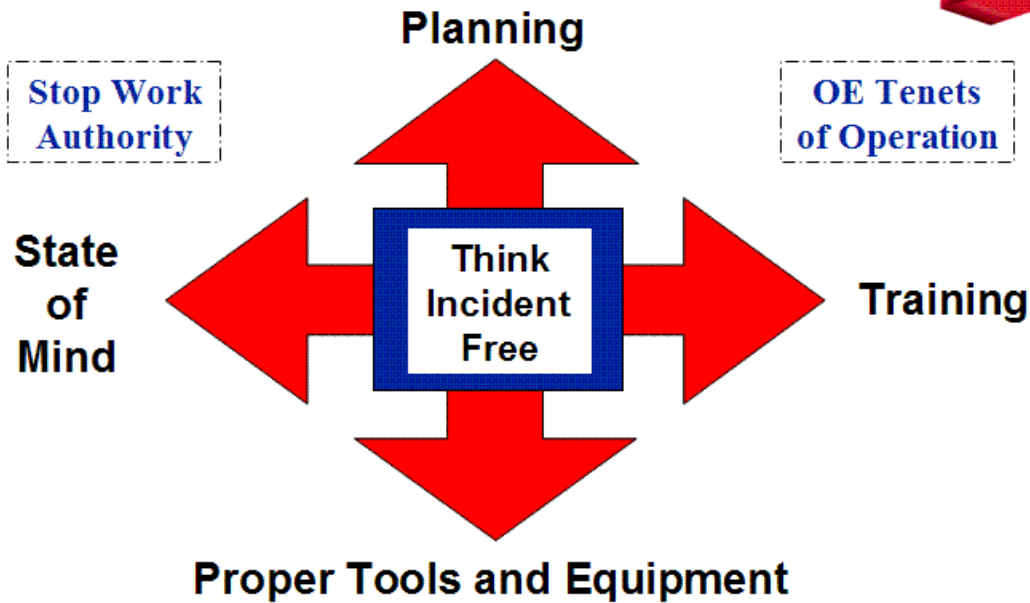
Gravity
The force caused by the attraction of all other masses to the mass of the earth.
Examples: falling object, collapsing roof, and a body tripping or falling

Motion
The change in position of objects or substances.
Examples: vehicle, vessel, or equipment movement; flowing water; wind; and body positioning when lifting, straining, or bending

Mechanical
The energy of the components of a mechanical system, i.e., rotation, vibration, or motion within an

Appendix E: Think Incident Free (TIF) Analysis

FOUR POINTS OF “THINK INCIDENT FREE”



THINKING BEFORE ACTING IS THE KEY TO WORKING SAFELY

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THINK INCIDENT FREE



Four points to consider for working safely:

<p align="center">1. PLANNING</p> <ul style="list-style-type: none"> • Do I understand the task and how to perform it? • Have I identified all hazards associated with the task? • How will I eliminate the hazards associated with this task? • Have I planned all job tasks? • Have I considered all safe work practices that apply to this task? • Do I need help to do this work safely? 	
<p align="center">4. STATE OF MIND</p> <ul style="list-style-type: none"> • Will I give my full attention to this task? • Will I stop and redo my plan if something unforeseen happens ? • Am I meeting or exceeding safety requirements for this task? 	<p align="center">2. TRAINING</p> <ul style="list-style-type: none"> • Have I been trained to do this work? • Have I been trained to use the equipment or tools required? • Have I been trained on the procedures of this work?
<p align="center">3. PROPER TOOLS & EQUIPMENT</p> <ul style="list-style-type: none"> • Do I have the Personal Protective Equipment (PPE) I need? • Do I have the right tools and equipment? • Have I checked if tools and equipment are in good working condition? 	

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Appendix F: On-site JSA Competency Development Model

Through various lagging metric analyses, inadequate JSAs continue to be seen across JO as a significant issue. The following information is provided in order to specifically address opportunities to improve the quality of on-site JSAs.

While training on the development and documentation of an on-site JSA is currently provided in the JOs, there is an opportunity to go beyond training to develop competency on JSA development **and** delivery. Competency not only involves training on how to complete a JSA, but also requires practical knowledge of the tasks and hazards. In addition, a demonstration of understanding of the hazard analysis procedure and the ability to communicate with diverse work teams is also critical.

Definitions

- Competencies define the applied knowledge, skills and behaviors that enable people to successfully perform their work.
- Knowledge is the information that allows a person to perform from an informed perspective.
- Skills are demonstrated abilities or proficiencies (e.g., Identification of Tasks at appropriate level of detail, Hazard Identification, etc.)
- Behaviors are the manner of conducting oneself, the response of an individual to his/her environment (e.g., Communicates Clearly, Fosters Collaborative Relationships, etc.)

Development Plan

Competency is developed in stages, and while sometimes advantageous, not all personnel involved in the JSA process require the same level of competency. A summary of competency levels is provided in Table 1.

NOTE: All personnel should be able reach the Basic Application level, and be seen as active participants in the on-site JSA process.

Table 1. Competency Level Summary

Competency Level	Description	Source
Awareness	A basic conceptual understanding of a JSA	Overview presentation, general knowledge
Knowledgeable	Understanding of the need for a JSA, the steps required to complete a JSA, the task to be performed, the typical hazards and controls associated with the task, and the Hazard Identification Tool	Learning activities: <ul style="list-style-type: none"> • Web-based training • Instructor-led/classroom coursework • Field discussions
Basic Application	Demonstrated understanding of JSA process	Participation in field activities as a member of a team
Demonstrated Comprehension	Demonstrate the ability to materially participate in development of a JSA	Observation and mentoring by work team leader who leads development and communication of JSA
Skilled Application	Leading development (acting as a facilitator) of JSAs, and demonstrating ability to communicate with and	Observation and coaching by competent personnel from outside the work team, of leader of JSA

	engage all members of work team	development
Analysis and Evaluation	Able to evaluate documentation for quality, conduct observations on peers and provide coaching to improve the process	The prize! If we can get a sufficient “critical mass” of personnel to this level, the process will be improved.

In order to identify personnel capable of progressing to a higher level of competency, observations can be used to determine who either based on current ability or through mentoring and coaching, has the ability for further development.

Field Observation and Coaching Guide

Planning – To identify what to observe, consider the following:

Type of Job	Equipment Involved	Characteristics of Workers	Situations
<ul style="list-style-type: none"> • What scheduled jobs relate to identified risks for your operations? • Is there unscheduled work that warrants observation? • Is there scheduled work by non-core contractors to observe? • Is there routine work planned that has recently resulted in an incident or near miss? • Is there routine work that has not been recently observed based on your defined schedule? 	<ul style="list-style-type: none"> • Do any jobs involve tools or equipment linked to previous incidents (e.g., cranes, man-lift, back-hoe, etc.)? • Does the job require isolation of equipment or energy sources? • Does the job require bypassing critical protections? 	<ul style="list-style-type: none"> • Is there an employee, or contractor crew you have not observed? • Is there a crew you want to follow-up from a previous observation? • Are there any SSEs working? • Is there a worker or crew that hasn't worked here recently? • Is there a worker or crew with a history of previous incidents? 	<ul style="list-style-type: none"> • Is work being done in a new location? • Is work near a highly populated area? • Can the work be affected by adverse weather conditions? • Does the work involve a new or revised SOP or standard? • Are there multiple workgroups involved? • Is Chevron supervision for the work area new to the role?

Planning – Before Going Out Consider the following:

<ul style="list-style-type: none"> • Do you need SME input about the job you plan to observe? • What key job steps or hazards relate to this work? • Are there procedures you could review in advance? • Do you have a defined scope of work or work order documentation? 	<ul style="list-style-type: none"> • What information do you need about the crew you will observe? • What's the crew's safety record? • Is this a regular crew or one that works for multiple companies? • Is anyone on the crew just back from vacation? Sick leave? • Is there anyone on the crew who has a record of safety violations? 	<ul style="list-style-type: none"> • Confirm the job start time • Determine if you want to be there at the beginning or after the job starts? • Make sure you have a phone number (e.g., Permit Approver, Field Specialist, Maintenance Planner, contractor supervisor) so you can locate crew if needed.
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Assess QUALITY of Pre-Job Safety Planning						
Get Oriented to the Job	Confirm the Major Job Steps	Identify the Hazards	Identify Their Mitigation Plan	Review Their JSA	Observe Their Work	Provide Feedback to Whole Crew
At job site with the Person Leading Work		At job site with full crew, but ask	random individuals	At job site with the Person Leading Work	At job site	At job site
<p>Do they know what to do?</p> <ul style="list-style-type: none"> • See the big picture? • Crew experience with this task? <ul style="list-style-type: none"> ○ How often? ○ Last time? ○ Training? ○ Experience with this equipment? ○ SSEs? <ul style="list-style-type: none"> • Crew make-up? • First language? • Crew experience with this JO? • Crew experience with this CVX? <p>Summary: Right scope? Right tasks? Right people? Right timeframe?</p>	<p>Do they know how to do it?</p> <ul style="list-style-type: none"> • Get them to point out the major steps (visualize) <ul style="list-style-type: none"> ○ Your understanding of the steps for this job? ○ Who is doing what? ○ Your role on this step? ○ How does the work of others affect your work? ○ Right tools & equipment in place? • If the job is already in progress, ask: <ul style="list-style-type: none"> ○ What step are you working on now? • How long will the job take? • Using written procedures? <ul style="list-style-type: none"> ○ If so, which ones? 	<p>How they can get hurt doing it?</p> <ul style="list-style-type: none"> • Their most critical hazards? • Test against random job Steps • Pinpointed? • Other hazards not mentioned? • Other hazards with tools & equipment? <p>Sample Questions</p> <ul style="list-style-type: none"> • Most hazardous part of this job? • Of any specific step? • Hazards seen before on jobs like this? • What tools did you use to help identify hazards (e.g., Hazard Wheel, TIF card, etc.)? How did you use this tool? • What did you find? 	<p>Do they know how to keep safe?</p> <ul style="list-style-type: none"> • Mitigation plans for hazards? <ul style="list-style-type: none"> ○ Cookie cutter vs. specific? ○ PPE needed for this task? ○ When mitigation will be done? ○ How? • Communication strategy for hazards, mitigations? 	<p>Did they write it down?</p> <ul style="list-style-type: none"> • Is JSA consistent with dialogue? <ul style="list-style-type: none"> ○ Validate scope ○ Did the work order scope the job properly? ○ Job steps need to be added? ○ Right number of crew? ○ Right tools & equipment? ○ Right sequencing with other crews? ○ JSA reflects changes in scope beyond work order? • Provide feedback on thoroughness of JSA <ul style="list-style-type: none"> ○ Correct inconsistencies on form or discuss with crew 	<p>Are they following their pre-job safety plan?</p> <ul style="list-style-type: none"> • Are they performing steps based on preplanning? • Are they mitigating the hazards as necessary? • Are their mitigation actions preventing or controlling the hazard? • Are other risks or unidentified hazards occurring? • Do you note scope or conditions changes? <ul style="list-style-type: none"> ○ If so, do they discuss it? ○ Do they update the JSA? 	<p>Use a positive feedback model:</p> <ul style="list-style-type: none"> • Find something positive they've done and give them feedback • Ask crew what they would do differently (i.e., how to make it safer next time) • Pinpoint 1 or 2 big things to work on (i.e., what's the takeaway?) • Thank the crew for taking time away from their job to talk with you about safety

Document Observation – Immediately after the Observation		
<ul style="list-style-type: none"> • Complete the observation form in private • Note technical safety issues you need to know more about • Note any action items 	<ul style="list-style-type: none"> • What feedback from the form needs to be shared with the: <ul style="list-style-type: none"> • Permit Approver • Person Leading Work or Contractor Supervision 	<ul style="list-style-type: none"> • Submit observation form for review/analysis per JO plan

Observations of on-site JSA

Observation of the on-site JSA process is time-consuming, and should only be conducted by individuals with demonstrated competency (e.g. SME, experienced HES personnel, etc.). Therefore, this process requires a significant commitment of resources to be successful.

Observations should be performed consistently, using a standardized form to focus observers on JSA development and execution. The following elements are critical to a successful observation:

- Identify specific jobs to be observed (high-risk, non-routine, incident history, etc.)
- Gather background information
- Schedule to observation with the work team
- Establish a relationship with the Supervisor and work team
- Get oriented to the job
- Confirm the major job steps
- Identify the hazards
- Identify the mitigations/controls
- Review the JSA form
- Observe the pre-job meeting and communication
- Observe the work
- Provide feedback to the supervisor and work team
- Document the observation

An example of an observation form can be found on the following pages.

Current JO Risk List

Risks & Key Behaviors	Yes	No	Comments (If "No," record why)
Risk:			
Risk:			
Risk:			
Risk:			



Safety Observation Form—Revision 4.2—7/12/10

General Information			
Observer:	Who is working? <input type="checkbox"/> Contractor:	Work Task Being Observed:	
Observation Date:	<input type="checkbox"/> Crew Pusher:		
Duration of Observation:	<input type="checkbox"/> Permit Approver:	Permitted Job? <input type="checkbox"/> Y <input type="checkbox"/> N	
	<input type="checkbox"/> CVX Employees		
Site Location: <input type="checkbox"/> Plant <input type="checkbox"/> Field	Names of SSEs Present :	Target Hazard(s):	
Number of people observed:	Name of Mentor Assigned:		
Part 1: Quality of Pre-Job Safety Planning (How well did the crew prepare before starting the work?)			
	Based on your DIALOGUE with the work crew: If a No , explain the GAPS:	Based on your REVIEW OF THE JSA document: If a No , explain the GAPS:	
1. Steps Identified ?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general <input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general <input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:	
2. Hazards identified (for steps identified) ?	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general <input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general <input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:	
3. Mitigation identified (for hazards)	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general	<input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Missing: <input type="checkbox"/> Too general	

identified) ?	<input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:	<input type="checkbox"/> Not in sequence <input type="checkbox"/> Other:
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Part 1: (CONT'D.)				
4. Additional	<input type="checkbox"/> Y <input type="checkbox"/> N	Dialogue with random crew members confirmed <u>shared understanding</u> of the steps, hazards & mitigations (i.e., consistency in responses)	<input type="checkbox"/> JSA covered wrong job <input type="checkbox"/> JSA was not written <input type="checkbox"/> JSA written but not available <input type="checkbox"/> Canned JSA missing site-/job-specific information <input type="checkbox"/> JSA covered too much work <input type="checkbox"/> Job inadequately scoped	<input type="checkbox"/> Crew began work before writing JSA <input type="checkbox"/> Steps, hazards & mitigations not correlated <input type="checkbox"/> Crew member signature missing on JSA <input type="checkbox"/> Other:
Part 2: Adherence to Pre-Job Safety Planning (How well is the crew following their safety planning <u>during</u> the work?)				
What job step(s) did you observe?	Did they perform this step based on their pre-planning? Y or N	Did they mitigate the anticipated hazard effectively? Y or N	Did unplanned hazards occur? Y or N	Did they mitigate the unplanned hazard? Y or N
				<input type="checkbox"/> Missed hazard: <input type="checkbox"/> Missed mitigation:
				<input type="checkbox"/> Missed hazard: <input type="checkbox"/> Missed mitigation:
				<input type="checkbox"/> Missed hazard: <input type="checkbox"/> Missed mitigation:

Part 3: Ensure Update of Pre-Job Planning When Scope or Conditions Change	
<input type="checkbox"/> Y <input type="checkbox"/> N Did scope or conditions change during or before your observation? If yes: <input type="checkbox"/> Y <input type="checkbox"/> N Did the crew(s) modify the written JSA form appropriately before you coached or questioned them? <input type="checkbox"/> Y <input type="checkbox"/> N Did the crew(s) discuss the changes? (Steps, Hazards, Mitigations)	
Part 4: Additional Questions Regarding the Crew or a Crew Member	
<input type="checkbox"/> Wasn't focused on the job (state of mind) <input type="checkbox"/> Lacked knowledge or skill related to the job task or correct use of tools/equipment (training) <input type="checkbox"/> Missing necessary tools or equipment for this job <input type="checkbox"/> Unfamiliar with or not following procedures related to this job	<input type="checkbox"/> Had to use SWA <input type="checkbox"/> Did not use the Hazard ID Wheel in their pre-job safety planning <input type="checkbox"/> Roles and responsibilities weren't clear <input type="checkbox"/> Failed to communicate appropriately with each other or with other crews also working
Part 5: Follow Up for Observer	
1. What good ideas or Best Practices emerged from this observation? Categories to check:	
2. Did you/will you provide feedback to the Permit Approver ? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> R+: <input type="checkbox"/> Δ:	
3. What feedback needs to be shared with contractor company ? Categories to check:	
4. What action items do leaders need to take, based on this observation? Categories to check:	
5. Have you observed this Crew Pusher before? <input type="checkbox"/> Y <input type="checkbox"/> N If Y, are the behaviors you coached on previously performed correctly now? <input type="checkbox"/> Y <input type="checkbox"/> N	
6. What talking points can you share at a morning meeting? (Notation, not for database.)	