1.0 Introduction

Canadian Plains Energy Services (CPES) is committed to protecting people, the environment, the public and its property from injury, damage, and loss. This is accomplished through continual hazard identification, assessment, and control processes. The desirable end result is to maintain a safe and healthy environment, while achieving sound operational (construction, fabrication, maintenance, electrical and instrumentation) practices and efficient project execution.

CPES management will provide resources (human, tools and equipment), procedures, practices and training for the safe execution of work, thus creating a climate that encourages worker participation in the development, implementation and support of the health, safety and environment management system. All workers are expected to participate in the identification of hazards, assessment of the hazards and implementation of identified controls for specific tasks and jobs.

Note: With direct involvement, workers provide valuable insight into performing their jobs safely and efficiently. Workers will improve the quality and usefulness of safe job procedures (SJP) and safe work practices (SWP) by assisting in their development and updating. As a result, worker commitment and ownership are created.

2.0 Scope

Hazard identification, assessment and control processes are used to identify health, safety and environmental hazards, assess the associated risks from those identified hazards and implement the application of controls to the associated hazards. Hazard Sources and hazards are required to be continually identified, assessed, and controlled.

The requirements specified in Section 2 and this policy, apply to all Company employees, independent service providers (ISP), contractors and subcontractors working for or through, CPES. The CPES group of companies shall comply with the requirements described in this section.

CPES performs operations in multiple government jurisdictions. It is expected that management and workers ensure the Hazard Identification, Assessment and Control processes intended for use, as a minimum, meet legislated requirements.

3.0 Objectives

To provide a framework for consistent hazard identification, assessment and control while maintaining compliance with legislated requirements for all operations within the CPES group of companies.

4.0 Key Policy Statements

- CPES will provide the resources for effective hazard identification, assessment, and control.
- All levels of the workforce will be trained and competent at both, using the resources, forms and documents that are applicable to the work being performed.
- Incorporate the **hazard source model** into the CPES methodology for hazard identification, assessment, and control.
- All workers on CPES projects or facilities shall use the tools communicated within Section 2.
- Contractors and subcontractors will use CPES hazard identification, assessment and control tools, unless a gap assessment has been performed in advance to ensure their hazard identification, assessment and control program meets or exceeds CPES'.

- Ensure a consistent risk assessment process is utilized across the CPES and contractor organizations.
- Management shall ensure effective hazard identification, assessment and control methodologies and program are in place. The manager shall:
  a) Establish the application for hazard identification, assessment, and control for his/her business unit (BU),
  b) Review and retain documentation as required,
  c) Communicate and delegate roles and responsibilities for hazard identification, assessment, and control program for all supervision levels,
  d) Verify resources are in place, effective and retain evidence of verification,
  e) Facilitate routine evaluation to determine the effectiveness of the hazard identification, assessment, and control program,
  f) Ensure the hierarchy of controls is being applied.

Hazard assessments are performed to protect people from injury and/or occupational disease while also protecting the environment, as well as company and public assets.

In addition, management and supervision must ensure that hazards, at risk behaviour and/or near misses are routinely identified and followed up on to ensure higher levels of control are implemented so CPES workers are better protected and less burdened with the continuous application of lower-level controls.

APPROVED: 
Aaron Karpan, President

1.0 Code of Practice

A code of practice provides practical guidance on the requirements of the company standard, jurisdictional regulations, or the adopted code applicable to the work site, safe working procedures in respect to the work site, and other matters as required within the jurisdiction the work is being performed.

1.1 Critical Task

A critical task is a task that has been assessed as Canadian Plains Energy Services' (CPES) highest risk based on internal and industry experience. (e.g., rigging and hoisting, energy isolation, driving, confined space, ground disturbance).

1.2 Safe Job Procedure

A procedure is a step-by-step sequence of actions to complete a specific task (i.e., Step 1 must be completed before going to Step 2). Safe Job Procedures are particularly important for Critical Tasks.

1.3 Prime Contractor

The organization responsible or having primary control and accountability to ensure the health and safety of workers on a worksite. The prime contractor is typically the site owner, but can be designated to another organization or entity such as CPES. The prime contractor has a responsibility to "ensure that any employer on a work site is made aware of any existing or potential work site hazards that may affect that employer's workers." (Reference Appendix 1 for regulatory requirements).

1.4 Contractor

A person, partnership, or group of persons who, through a contract, an agreement or ownership, directs the activities of one (1) or more employers involved in work at a worksite (Reference Appendix 1 for regulatory requirements).

1.5 Independent Service Provider (ISP)

A term to identify sub-contractors within CPES operations. ISP's are typically self-employed contract service providers responsible for their own business risk coverage and shall follow CPES HSEMS processes.

1.6 Decision Tree

A diagram to assist in decision making depending on CPES's role in the given project or work being performed.

1.7 Hazard

A condition or set of circumstances that has the potential for causing harm to people, property, or the environment.

1.8 Hazard Source

A common origin of related hazards and/or potential energy release. Energy sources consist of thirteen (13) forms, that could cause injury or loss due to unintended release. For example, the hazard source is electricity, and related hazards are overhead power lines, breakers and static.

1.9 Human Factors
Human factors involve the study of all aspects of the way humans relate to the world around them, with the aim of improving operational performance, safety and risk management through improvement in the experience of the end user. Human performance is the outcome of what a person does, how they interact considering workplace design, procedural design and behavioural factors.

1.10 Project
A job that requires considerable or concerted effort, a large or major undertaking, especially one involving considerable resources, personnel, and equipment. The project requires significant planning and supervision. Project parameters may consider risk, scope of work, duration, specific timelines, location, outside resources (including subcontractors). If the above requirements are not met, then consider the job to be Short-Term Work.

1.11 Risk
Probability of injury, occupational disease or loss. Probability and severity of loss are linked to hazard sources.

1.12 Risk Assessment
A risk assessment is a process used to assess the potential for an event to occur as a result of a hazard. Risk assessments consider two distinct criteria, which are probability of occurrence (what is the chance of the event happening) and potential severity (how bad can it be).

1.13 Rule
A rule or prevailing standard is either site specific or pertains to a specific type of site or activity. A rule is something that must always be done, or not be done, and must be enforceable. Examples of rules include:

- Smoking is not permitted on CPES property except as specifically designated.
- All tank trucks must connect ground / bonding cable before attaching hose to load line.
- Only competent operators can operate lifting equipment.
- Only a qualified electrician can disconnect electric motors.

1.14 CPES Group of Companies
The hazard identification, assessment and control program apply to all CPES companies.

1.15 Safe Work Practice
Not all tasks can or should be in a procedural format. A safe work practice is a set of guidelines or key points that may not be required if the task cannot be performed sequentially (e.g., working at heights). They provide guidance and assistance for the activities required to perform the specific task. Some tasks require only rules or simple engineering controls to minimize risk exposures. This is particularly true of tasks in trades, such as maintenance, which may be required to be completed differently in each occurrence and therefore cannot be performed in a step-by-step manner. For tasks of this nature, safe work practices are more functional. This is also a function of worker competency as to their ability to apply skills and knowledge to meet the intent of safe work practices.

1.16 Serious Incident
Refer to the CPES Health, Safety and Environment Management System, Section 10.1, Part 2.7.

1.17 Significant Incident
Refer to the CPES Health, Safety and Environment Management System, Section 10.1, Part 2.6.

1.18 Stop Work
A formalized process to stop work when conditions become unsafe at a worksite. An investigation and implementation of corrective actions is required before work can resume.

1.19 Refusal of Unsafe Work
A worker has the obligation to Refuse Unsafe Work, if the worker believes that a specific task requested of them is unsafe or hazardous to them or to others.

1.20 Stop Task
A process to stop task to complete a hazard reassessment and self assessment.

1.21 Tasks
Are the specific sequence of steps, actions, or activities a worker must perform to complete their job or work assignment.

1.22 Task Hazard Analysis (THA)
A task hazard analysis is an analysis process of breaking out the steps relative to completing the task, identifying the specific hazards and controls for each step, and risk ranking each step required.

1.23 Training
Training is one of the processes required to establish competency (the others are knowledge and experience). Examples of training include:

- Orientation of new or transferred workers
- Qualifications and skills training
- On-the-job training and competency assessment (to industry and company accepted standards)

1.24 Worker
A person engaged in an occupation and/or task.

2.0 Immediate Causes for Injury/Incident as it Pertains to Hazard Sources

2.1 Line of Fire
At-risk condition and/or action where a person and/or equipment are at risk of injury and/or damage as a result of the release of energy (i.e. standing in front of a pig trap and/or swing path of pig trap cover).

2.2 Pinch Points/Crush points
At-risk condition and/or action where a person is at risk of injury as a result being contacted by equipment and/or items in motion (i.e. standing between pieces of moving equipment and/or stationary object, like a side-boom and a pipeline, or hands/fingers between pipe flanges during bolt-up).

2.3. Struck
To come in contact with an object and/or struck by an object.

2.4 Point of Entry
The route by which a product of substance enters the body (i.e. absorption, inhalation and ingestion).

2.5 Sharp Surfaces/Edges
At-risk condition where a person is at risk of injury as a result of being in contact with a work surface, equipment or work environment with jagged, sharp or pointed surfaces or edges. (i.e. knives, tin, steel, etc.).

1.0 Employee/Worker Responsibilities

It is the responsibility of each employee/worker to:

- Engage in the identification, assessment, and control of workplace hazards.
- Assist supervisors & management in identifying hazards on the job.
- Report any uncontrolled hazards to their supervisor or management.
- Refuse unsafe work or situations.
- Communicate at-risk conditions to others on the worksite to help minimize the potential for injury/incident.
- Utilize the Safety Observation (SOC) Program to help identify and communicate hazards, correct at-risk behaviours, and reinforce positive behaviours.
- Monitor for new hazards and changes, communicate concerns that arise while performing job tasks.
- Stop task and reassess the hazard sources and hazards periodically, after work breaks, and when conditions change.

1.1 Supervisor Responsibilities

It is the responsibility of the Supervisor (superintendent, foreman, lead designate) to:

- Lead in the identification, assessment, and control of workplace hazards.
- Ensure that employees/workers are trained/competent in the HIAC process.
- Engage with client/owner representatives to ensure hazards are communicated and adequate controls applied.
- Assist and coach workers with Hazard Identification, Assessment and Control.
- Ensure CPES hazard identification, assessment, and control (HIAC) process is implemented at the workplace, including completing documentation.
- Communicate hazards and controls with employees/workers and ensure that employees/workers understand what is expected of them.
- Address and control hazard sources by utilizing the hazard control hierarchy.
- Verify that controls have been implemented.
- Stop work if high-risk hazards remain AFTER controls are applied, and line management must be notified.
- Communicate status of medium risk hazards to line management.

1.2 Line Management Responsibilities

It is the responsibility of the Managers, Project Managers or other designated Managers to:

- Ensure effective implementation of Hazard Identification, Assessment and Control (HIAC) process.
- Ensure supervisors are addressing hazard sources by utilizing the hazard control hierarchy.

- Ensure that Contractors and Subcontractors have an effective HIAC process.
- Provide necessary HIAC training to front line supervisors.
- Monitor the application of CPES HIAC process to determine effectiveness and understanding.
- Mentor and assist with HIAC process.
- Facilitate resolution to extreme and high-risk hazardous situations identified from supervisors to attain low risk ranking. If not able to achieve, then refer to senior management and ensure work is stopped until the hazardous situation is resolved.

1.3 Senior Management Responsibilities

Senior Management (Executives and Regional/General Managers) is responsible for:

- Set company policy with respect to HIAC.
- Ensuring resources are available to properly complete HIAC process.
- Review extreme and high-risk hazardous situations identified from line management to attain low risk ranking. If not able to achieve, provide direction.
- Assess the effectiveness of HIAC process.

1.4 HS&E Responsibilities

- Advise, mentor and assist on the interpretation of Section 2, Hazard Identification, Assessment and Control.
- Assist with the completion of the HIAC Control methodologies, where required.
- Audit the effectiveness of the HIAC process.
- Complete regulatory review to ensure CPES HIAC process meets the intent of applicable legislation.

1.5 Health and Safety Committees' Responsibilities

Representatives from applicable regulatory Joint Health and Safety Committee, Occupational Health Committee, or Joint Worksite Health and Safety Committee will review effectiveness of risk management processes and sharing lessons learned.

1.6 Subcontractors

It is the responsibility of each Contractor and Subcontractor to:

- Have an effective HIAC process that meets or exceeds Canadian Plains Energy Services (CPES) requirements and if not utilize CPES' process.
- Have an effective Task Hazard Analysis (THA) and/or Job Safety Analysis (JSA) system and if not utilize CPES' process.
- Engage in identifying, assessing and controlling workplace hazards.
- Assist supervisors & management in identifying hazards on the job.
- Report any uncontrolled hazards to CPES representative.

- Refuse unsafe work or situations.
- Communicate at-risk conditions to others on the worksite to help minimize the potential for injury/incident.
- Utilize the Safety Observation (SOC) Program to help identify and communicate hazards.
- Monitor for new hazards and changes, communicate concerns that arise while performing job tasks.
- Apply stop task process.

1.8 Owner/Customer / Primer Contractor

It is the responsibility of the owner/client to:

- Inform CPES representatives of the hazard sources and hazards associated with potential project and/or job being scoped.
- Inform CPES representatives of the site-specific hazards and hazard sources.

1.9 Visitors Responsibilities

It is the responsibility of each visitor to:

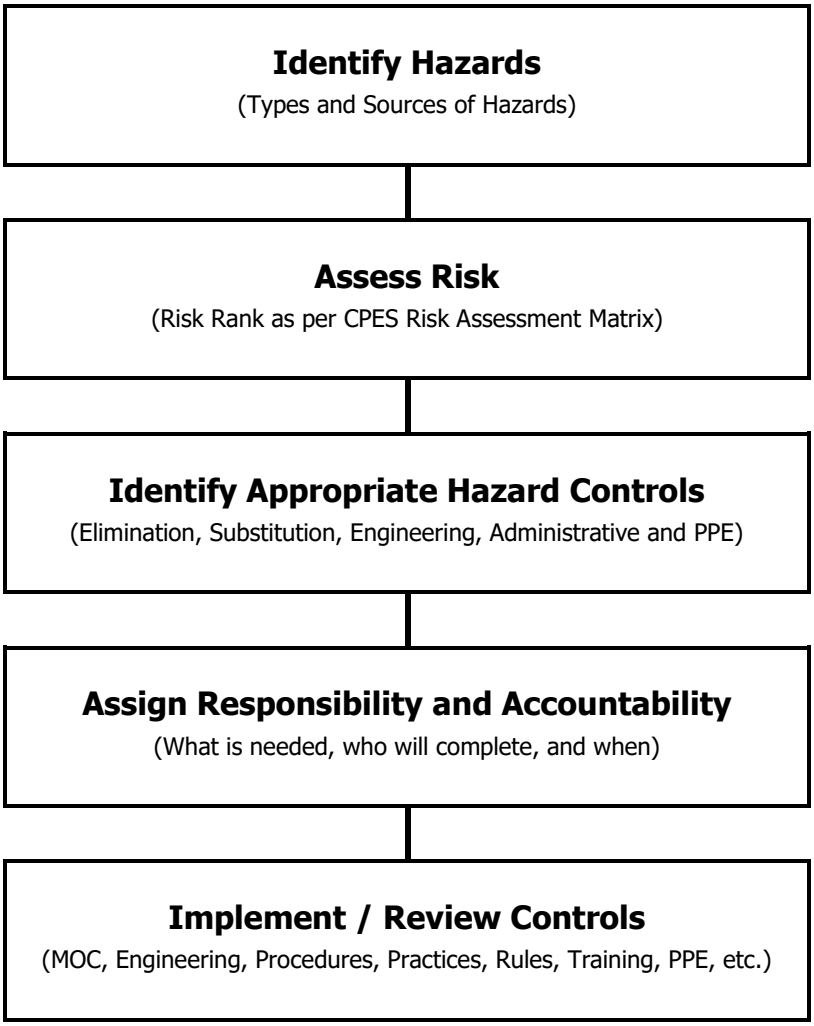
- Always be accompanied by a CPES designated representative and made aware of the site-specific hazards.
- Assist with the identification of hazards.
- Report any uncontrolled hazards to site representatives and/or management.

1.0 Hazard Identification, Assessment and Control (HIAC) Flow Chart

The Canadian Plains Energy Services (CPES) hazard identification, assessment and control program follows a five-step process to ensure the safety of employees, independent service providers, contractors, the public and protecting the environment, and property from an incident.

Figure 1 – Hazard Identification, Assessment and Control Process

The Hazard Identification, Assessment and Control process includes the following steps:



2.0 Hazard Sources and Human Factors

CPES has identified thirteen (13) hazard sources and human factors that should be considered while developing hazard assessments throughout the work life cycle (e.g., pre-project evaluation, daily task hazard assessments, etc.). Through the practice of identifying hazard source(s) and human factors, the worker/team can consider and identify all hazards related to each source and factor. For example: "electrical" source = overhead power lines, buried power lines, power lines in walls or structures, energized panels, switches, power cords, etc.

Refer to Section 2.5, Resources/Additional Information, for examples of hazards and work activities associated to hazard sources.

Refer to Section 2.6, Human Factors, for examples of human factors.

3.0 Risk Assessment Characteristics

After the hazards have been identified, their risk must be assessed. Strike uses the **risk assessment matrix** to aid in, determining whether the hazard, situation or substandard condition presents an unacceptable risk. To determine the level of risk, you must consider the probability and severity of an event occurring.

1. **Potential severity** is based on how severe the event would be if no preventative measures were introduced (Figure 4).

   Note: Company reputation and image is also a consideration of potential consequence.

2. **Probability of occurrence** is based on the chances of the event happening if the existing hazards or conditions are not corrected (Figure 3). To judge the probability, look at:

   a) Frequency
   b) Industry history
   c) Number of people involved or exposed
   d) People's familiarity with the process
   e) History
   f) Prediction

Figure 3 – Criteria for Evaluating Probability of Occurrence (Before) **Controls**

Probability of Occurrence	Potential Frequency
5 – Frequent	Expected to occur several times per year within CPES operations or the oil and gas construction industry.
4 - Probable	Likely to occur once every 2-4 years within CPES or the oil and gas construction industry.
3 - Occasional	Likely to occur every 5 – 10 years within CPES or the oil and gas construction industry.
2 - Remote	Not likely to occur within CPES operations at any time. Has been known to occur in oil and gas construction industry.
1 - Improbable	Very unlikely to occur, not impossible. Has been known to happen in the construction industry.

4.0 Risk Assessment Matrix- Definitions

Figure 4 – Criteria for Classifying Incident Severity

	Potential Consequence				
	Ranking	**Harm To People**	**Harm To Environmental**	**Assets**	**Reputation**
Potential Severity	**4 - Catastrophic**	Permanent or total disability or fatality: • Fatality(ies) • Permanent Disability(ies) • Multiple lost time injuries • Occupational Illness such as asbestosis or silicosis	• Spill volume >200 litres of flammable liquids • Effects to fish bearing streams or potable ground water • Government reportable	• Operational/facility and/or other losses >$1M, may include client/customer loss	• Impacts >100 people • National media attention
	3- Serious	Injury or health effect: • Lost time injury • Occupational exposure such as noise induced hearing loss, asbestos and NORMs	• Spill volume 20 to 200 liters of flammable liquids • Effects to non-fish bearing water bodies • Corrosives >5 litres	• Operational/facility and/or other losses $50K to $1M, may include client/customer loss • Vehicle damage >$10K • Equipment damage >$10K	• Impacts 25 to 100 people • Provincial media attention • OHS Stop Work Order
	2- Significant	Injury or health effect: • Medical aid • Restricted/Modified work	• Spill volume 5 to 20 liters – controlled products • Corrosives <5 litres	• Operational/facility and/or other losses $2K to $50K, may include client/customer loss • Vehicle damage $2K - 10K • Equipment damage $2K -10K	• Impacts <25 people • Municipal or community media attention • OHS Compliance Order
	1-Negligible	Injury or health effect: • First Aid • Exposure to health hazards that give rise to noticeable discomfort or minor irritation (e.g. welder's flash, frost bite, repetitive strain)	• Spill volume <5 litres (controlled products) • Visible staining/ sheen	• Operational/facility and/or other losses <$2K, may include client/ customer loss • Vehicle damage <$2K • Equipment damage <$2K	• Impacts 1 or 2 individuals

Once the hazard's potential severity and probability have been determined, they are applied to the Risk Assessment Matrix (Figure 5). The Risk Assessment Matrix provides Managers, Supervisors, & Workers to assess the degree of risk that a hazard may pose to them prior to implementation of controls to workers, the public, and/or the environment, and determines the appropriate corrective actions to be completed. Refer to Risk Assessment Matrix HSEMS (S-01) and Stop & Think HSEMS (S-02).

The objective of the risk assessment process is to move risk to a lower category in the matrix by either:

- Reducing the probability of occurrence through hazard prevention, or
- Reducing the potential severity of an event through hazard control.

Figure 5 – Risk Assessment Matrix (S-01)

Risk = Severity x Probability		Potential Severity			
		1– Negligible	2 – Significant	3 – Serious	4– Catastrophic
Probability of Occurrence	5–Frequent	5 Medium	10 High	15 Extreme	20 Extreme
	4–Probable	4 Low	8 Medium	12 High	16 Extreme
	3–Occasional	3 Low	6 Medium	9 Medium	12 High
	2–Remote	2 Low	4 Low	6 Medium	8 Medium
	1–Improbable	1 Low	2 Low	3 Low	4 Low

Extreme Risk	Work must be stopped and risks must be addressed immediately with additional controls to reduce risk to medium or low risk classification, before work can continue. Immediate interim controls and precautions are acceptable until a final solution is developed and implemented.
High Risk	Are undesirable and require additional controls to reduce risk to a medium or low risk classification within a specified time. Consider immediate interim controls and precautions where practical, and notify exposed workers about the hazards.
Medium Risk	Should be investigated further to examine the need for additional controls. Reasonable options are typically available to reduce the risk of hazards.
Low Risk	May not require any further analysis; apply risk controls as required.

Risk assessments are used as a tool to formulate the criteria for prioritizing which hazards require additional controls measures. The application of controls measures are to be based on the hierarchy of controls which includes elimination, substitution, engineering, administrative and personal protective equipment.

4.0 Instructions for Using the Risk Assessment Matrix

1. Identify the hazards including situations, behaviours, or substandard conditions.
2. Estimate **potential severity** and **probability of occurrence** associated with the hazards.
3. Estimate the hazard risk level from the analysis.
4. Address and control risk situations.

5. Once you have assessed the hazards and ranked them from the matrix, prioritize the hazard according to the number from the risk matrix.
6. Use this as a guide to establish the necessary controls for the highest risk hazards. With this risk assessment matrix, all rankings of ten (10) or more become priority #1 and these should be addressed first.
7. Develop and apply controls.

5.0 Risk Assessment Matrix

The **Risk Assessment Matrix** is a guide for determining the potential severity and probability of an occurrence related to each task or project and assists in making an informed decision about risk control. The risk assessment matrix can be used for managerial decisions or when work has stopped due to unresolved conditions.

The Risk Assessment Matrix identifies the ranking parameters for **potential severity** and **probability of occurrence** with criteria that will provide guidance in determining risks associated with a specific hazard. These are:

1. **Potential severity** is based on how severe the event would be if no preventative measures were introduced.

   Note: Company reputation and image is also a consideration of potential consequence.

2. **Probability of occurrence** is based on the chances of the event happening if the existing hazards or conditions are not corrected. To judge the probability, look at:

   a) Frequency

   b) Number of people involved or exposed

   c) History

   d) People's familiarity with the process

   e) Industry history

   f) Prediction

The objective of the risk assessment process is to move risk to a lower category in the matrix by either:

- Reducing the probability of occurrence through hazard prevention, or
- Reducing the potential severity of an event through hazard control.

5.0 Managing Risk

Hazards identified during any type of risk assessment must be managed to acceptable or "LOW" risk ranking. Should existing controls be unable to achieve the "LOW" risk ranking, then work must stop until additional controls are implemented. This may include a review by a manager and/or external resources.

While completing hazard assessments and risk analysis we may encounter situations where appropriate controls have not been identified therefore hazards have not been adequately controlled. In these situations, work must stop until adequate controls are in place. Managers must be contacted for all of the "HIGH" or "EXTREME" risk ranking. If you are uncertain of the risk ranking or the ability to manage the risk then consult with appropriate management.

Utilize the Stop Work Order form to communicate to your manager as per form instructions (Form # CF-S-22). All stop work designations must be investigated by the Manager with support from the Health, Safety and Environment department. Documenting the status of hazards, recommendations for improvements and the follow up to closure for each action item is required.

6.0 Hierarchy of Controls

Control of hazards may be performed in several ways depending on the level of risk from the specific hazard. Hazards sources may be eliminated completely resulting in the total reduction of risk from that hazard source. Control measures may include a combination of engineering or substitution controls, administrative controls, and the use of Personal Protective Equipment (PPE). All controls should be implemented via the Section 2, Hazard Identification, Assessment and Control (HIAC) process described throughout.

The four approaches to Hazard Control are:

Elimination

The hazard or work has been eliminated or shifted to more appropriate area. Example: Welding expected to be done in a live facility, instead complete welding in a safe area with no flammable/explosive source.

Substitution

A hazardous material or work process is substituted for a less hazardous material or process. Example: Substituting a toxic chemical with a non-toxic chemical.

Engineering Controls

Engineering controls are used for reduction of the risk of exposure by preventing interaction of people with the hazard. Engineering controls may include, but are not limited to:

a) Isolation or enclosure of the worker or process,
b) Installation of abnormal operation sensors and emergency shutdown devices,
c) Use of barricades or other restraining devices to prevent worker contact around or under dangerous or hazardous operations,
d) Exhaust ventilation,
e) Guarding, and
f) Use of specialized materials.

Administrative Controls

Administrative controls are used where engineering controls are unable to be implemented. These may include, but are not limited to:

a) Developing and implementing procedures, safe work practices and enforceable rules,

b) Limiting the time of worker exposure,

c) Using a safety watch person for critical tasks (e.g., fire watch, traffic control, hoisting activities, confined space),

d) Providing worker training, competency assessment. Refer to **HSEMS Section 8, Training and Communication** for details, and

e) Direct supervision.

Personal Protective Equipment (PPE)

Personal protective equipment (PPE) is considered the last resort for hazard control. However, PPE is most often used in combination with other hazard controls. The purpose of wearing PPE is to provide additional reduction in the workers' risk by minimizing the exposures of their contact with the hazards. All workers requiring PPE must be properly trained in its use, care and maintenance.

All persons working at or visiting a CPES location must adhere to all safety requirements, including the wearing of PPE. CPES provides or subsidizes PPE to its employees as required by the job or task. Refer to **HSEMS Section 6, Personal Protective Equipment (PPE)**.

9.0 Implementing / Reviewing Controls

When implementing/reviewing controls, proceed as follows:

a) Review controls to ensure they meet the intent of hazard control as identified in the Hazard Assessment.

b) Inform workers and provide training on any additions/deletions of hazards due to equipment and/or process change.

1.0 Introduction

Through the HIAC process our goal is to identify the hazards and manage the risks associated with the work CPES performs to ensure the health and safety of workers and work site environment

2.0 HIAC Process

HIAC is used to establish higher level hazard identification and control direction throughout the work life cycle including task hazard reassessments, informal continuous assessment process (Stop & Think) and any out of scope work we perform.

Based on the HIAC Processes the following tools shall be utilized to identify and control work site risks. These tools are designed to stimulate the engagement of our employees, ISPs, subcontractors in HIAC. The tools may be applied/utilized differently depending on project scope, customer requirements, etc.

Hazard Identification, Assessment and Control - HIAC (CF-S-01)

HIAC must be completed before work begins at the worksite and reassessed as required. There are three (3) types of scenarios where this tool is utilized:

- Pre-job/Site - High-level analysis of the project within Strike operations. These assessments identify common hazard sources, specific related hazards and the controls needed such as, pressure, toxic/carcinogenic, ground disturbance, electrical, mechanical, fire/explosion, chemical, noise, motion, or work in live facility or green field, etc. This allows for proactive planning for the project or work team in advance of work execution.
- Task Hazard Analysis – To be used while planning work/task(s). This allows for proactive planning to ensure the right tools, equipment, personnel, and preparations are in place for the work. This tool identifies specific hazard sources and the controls that are required. In addition, it provides the opportunity to stop or delay work until additional approvals or resources are sourced.
- Reassessment - The tool can also be used for reassessing work. When the scope, process and/or conditions of planned tasks change.

Task Hazard Analysis (THA) (CF-S-02)

This tool can be used as a template/resource for the individual work teams to develop task procedure for high risk, infrequent, complicated tasks or when no formal SJP exists. The THA will consider the scope of work, steps taken to complete the task, identify hazard sources and specific related hazards. An analysis of the hazards is then completed to assess that risk before and after the implementation and verification of controls. A critical component of the THA is the assessment of risk before and after controls have been identified. The implementation of THAs is at discretion of the Project Manager/ Superintendent.

Pre-job Safety Meeting (Form CF-S-03):

Tool to guide the discussion or planning session(s) for a Project Kickoff in order to identify and initiate planning for key hazards and risks. Part of the pre-job safety meeting should be a discussion on concurrent operations. The implementation of the Pre-Job Safety Meetings is at discretion of the Project Manager/ Superintendent.

Daily Tailgate Meeting (Form CF-S-04):

The daily tailgate meeting is primarily used to communicate the job scope and coordinate work being preformed that day. Additionally, it is used to review the hazards and resulting controls identified in the pre-job or site HIAC. The daily tailgate meeting also provides a list of other critical discussion points such as SJPs, SWPs, recent incidents/learnings, etc. and review of concurrent operations that may be underway that have a potential impact.

Additional Resources:

- S-01 Hazard Assessment Ranking Matrix
- S-02 Stop and Think
- Section 2.6 Hazard Sources Examples
- Section 2.7 Human Factors Examples

3.0 Hazard Reassessment

The hazard reassessment process supplements the CPES HIAC primary methodologies (Pre-Job, Site and Task Hazard Analysis) and supports original job or task specific HIAC efforts. The intent is the same, to reduce injuries, incidents, and losses by recognizing and controlling hazard sources however the timing is different. Hazard reassessments are to be utilized for the following:

- Scope of work has changed
- New hazard sources/hazards identified
- New personnel enter job site or joins task work
- Conditions change (job site, weather, site representative)
- New/different equipment needed to complete task

The expectation is that CPES employees/ISPs will utilize the hazard reassessment process. This can be documented either on your Hazard Identification, Assessment and Control – HIAC form (CF-S-01) or Hazard Reassessment Form (CF-S-40). The intent of the hazard reassessment form is to assist workers in reassessing the hazards and controls on the job face.

A specific outcome of using the Hazard Reassessment tool is to determine if the work can continue or if a more formal work stoppage is needed to ensure adequacy of tools, equipment, people, time, conditions.

4.0 Informal (On-going) HIAC Process – Stop & Think

The informal HIAC process consists of a thought process conducted by an individual before starting a task. The thought process uses the same steps as the Hazard Identification, Assessment and Control – HIAC form (CF-S-01), but it is not documented. In some situations, the informal hazard assessment may trigger a Hazard Reassessment or a Task Hazard Analysis. Informal hazard assessments are performed by individuals and apply to the day-to-day or task-to-task activities.

There are five (5) basic steps to complete the informal hazard assessment. The graphic below provides a summary of the steps involved with performing an informal hazard assessment.

Ask the following questions before performing a task or job:

1. **Stop and Think**
2. **Identify Hazard Sources.**
   - Do I understand my job/task
   - Am I physically and mentally prepared to do each task?
   - What could go wrong?
   - Is there a danger to myself or others?
   - What could change and create a new risk?
   - Could other crews, workers or conditions pose a risk to me?
   - Can the condition of my equipment and tools pose a risk to me?

3. Assess the Risk
- How likely is this to happen (what is the probability)?
- What are the consequences if this happens?

4. Control the Risk
- Are permits, written procedures, etc. required and available?
- What can I do to reduce the risk?
- Will the control affect another part of the task being done?
- Do I need to tell anyone?
- Is there someone I can call for help?
- Are emergency response plans needed?

5. Resume Work

Refer to S02 for Stop & Think poster.

7.0 Safe Work Permits, Safe Work Agreements and Checklists

Safe work permits/agreements are typically issued by the owner/client on worksites. Strike may issue safe work permits where we are the Prime Contractor. Reference COP 09 Safe Work Permit for more information.

9.0 Hazard Assessment and Other Tools

Other CPES methodologies for hazard assessment and reassessment include:

- Safety Observation Card (SOC): CF-S-08
- Stop Work: CF-S-22

10.0 Health, Safety and Environmental Inspections

Planned health, safety and environmental inspections are important management tools for preventing events. Inspections provide an opportunity for workers to participate in the identification and control of hazards at their job site. The purpose of planned health, safety and environmental inspections is to identify hazard sources, substandard conditions and practices and address hazards and ensure continued compliance with applicable hazard controls that are expected to be in place as well as assess compliance to government regulations and other CPES standards.

1. Inspections can be formal or informal based on CPES's inspection protocol (See Section 9 Inspections for more information).
2. Formal inspections must be documented.
3. CPES has several inspection protocols available to address the needs of our operations.
   a) Facility Inspection – CF-S-49
   b) Worksite Safety Inspection – CF-S-19
   c) Office Inspection – CF-S-52

Audits are used to evaluate the effectiveness and suitability of meeting planned objectives. Audits may be used to evaluate processes or systems. HSE System audits evaluate the suitability and effectiveness of the HSE System in meeting internal, customer and regulatory requirements.

Audits may be conducted by internal resources of by accredited third party organizations. Internal audits serve to promote continuous improvement of processes and systems, while external audits provide assurance to customers, regulators and other interested parties.

Audits are documented and offered suggestions and/or recommendations for improvement. Audits, and their results, are a part of the management review and corrective action planning process.

1.0 Audit Schedule Guidelines

CPES will evaluate the implementation and effectiveness of HIAC as part of a planned measurable process and as per the following schedule:

a) 3 months after initial implementation of HIAC (Company-wide , Business Unit and/or process)

b) During annual HSE Management System Evaluations

c) During HSE Evaluations (CF-S-50)

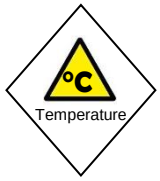
d) Review CPES's formal task hazard analysis (THA) inventory every 5 years or as changes occur (e.g. new business line added)

Canadian Plains Energy Services (CPES) has identified 13 (thirteen) hazard sources for work we perform. Table 2.5.1 provides examples of hazards associated with the activities that we perform. Table 2.5.2 (template) may be utilized to identify division/pillar specific hazards and tasks associated to each hazard source.

Table 2.5.1 **Examples** of Hazards Associated with Hazard Sources

Hazard Source	Examples of Hazards Associated to Hazard Source	Task Inventory
	• Mould/Mold • Hanta Virus • Blood Borne Pathogens (Hepatitis, HIV) • Flu – H1N1	• Demolition • Maintenance – field facilities • Office maintenance • Administering 1st aid • Shared kitchen facilities • Washrooms • Waste Management
	• Controlled Products (Acid, Methanol, Gasoline) • Heavy Metals • Mercury • Lime	• Refueling • Cleaning • Coating – application / removal • Pickling • Welding • Concrete Work • Waste Management
	• Overhead Power Lines • Underground Power Lines • Electrified System (Transformers, Power Cords) • Powered Tools • Lightning	• Pipelining • Excavation • Servicing live equipment • Tie ins • Temporary power • Generators • Burn Piles • Power Isolation • Lock Out/ Tag Out
	• Live/ Operating Facilities • Flammable Gas • Flammable Liquids • BTEX (Benzene, Toluene, Ethylbezene, Xylene) • Stored fuel sources (Gasoline, Propane, Acetylene) • Trapped Gas (Natural Gas, H2S) • Pyrophoric Materials (Iron Sulphide)	• Refueling • Working in proximity live client facilities • Working in ditches • Abandonments • Plant Turn Arounds • Valve and plant maintenance • Building Entry • Atmospheric Monitoring • Purging

Hazard Source	Examples of Hazards Associated to Hazard Source	Task Inventory
	• Hoisting Loads • Suspended Loads • Trenches/Excavations • Icy/ Slippery Conditions • Fall-to-lower level	• Pipe laying • Working in Trenches • Overhead • Manual lifting • Working at heights • Slippery / muddy locations • Working on slopes • Stacking and storage • Load securement • Hoisting/ Rigging • Suspended Loads
	• Rotating Equipment • Pulley systems • Cranes, booms • Heavy Equipment • Welding Positioners	• Replacing belts / servicing • Hand tools – grinders, drills, • Equipment Maintenance • Paper Shredding • Welding Operations • Millwright Work • Lock Out/ Tag Out
	• Mobile Equipment • Traffic - Vehicle • Human (Ergonomics, Walking) • Moving Loads • Swinging Loads • Load Securement	• Laboring around moving equipment • Paper shredding • Driving • Backing up • Spotting • Manual Lifting • Positioning Equipment/ MODS/ Pipe • Lock Out/ Tag Out
	• Wildlife (Snakes, Spiders, Bears, Moose, Deer, etc.) • Weather Conditions (Rain, Wind, Snow, Fog, Lightning, etc.)	• Driving • Walking right of ways • Pipelining • Pigging lines • Cleaning locations • Surveying
	• Equipment (Air Compressor, Compactors, Yellow Iron) • Compressor Buildings • Tools (Jack Hammers, Grinders) • Explosions • Pile Driving • Plant ESD (Emergency Shut Down) • Vibration	• Operating equipment • Welding • Grinding • Sand blasting • Alarm horns • Fabrication in shop • Music in shop • Installing Compressors • Hydro Vac'ing

Hazard Source	Examples of Hazards Associated to Hazard Source	Task Inventory
	• Pressurized/ Energized Lines • Compressed Gas / air • Hydraulic Systems • Low Pressure Systems • Vacuum • Stored Energy • Boomers	• Turnarounds • Welding • Removal of lines • Opening vessels / lines • Shrinking sleeves • Transporting pressurized bottles/cylinders • Hydraulic lines • Lock Out/ Tag Out • Purging
	• Radiography (X-ray) • Naturally Occurring Radiation Materials (NORM) • Sun • Arc Flash • Densimeter (Compaction Testing) • Microwave • Radio Waves	• Integrity Testing • Cleaning vessels • Tie-ins • Pipeline repairs • Removing breakers • Opening panels • Working outdoors • Compaction Testing • Welding
	• Hot Surfaces (Pipes, motors, torches) • Hot Stress • Cold Stress • Steam release • Welding/Grinding Slag (molten steel) • Hot fluids (produced H_2O) • Cold fluids (liquid nitrogen, CO_2)	• Welding • Preheating • Stress relief • Working outdoors in summer / winter • Inside adjacent to high heat sources • Working at elevated heights • Confined Space
	• H_2S • Benzene • O_2 Deficient Atmosphere • SO_2 • CO_2 • Lead • Welding Fumes • Silica • Asbestos	• Vessels • Ditch work • Tanks • Purging • Confined space entry • Facility maintenance – Live / abandoned • Demolition • Office Maintenance • Welding • Sandblasting • Smoking

Human Factors is the science to determine factors that affect human performance. Human performance is the outcome of what a person does, (e.g. workplace design, procedure design and behavioural factors).

Canadian Plains Energy Services (CPES) has identified nine (9) human factors as considerations when completing the HIAC process. Table 2.6.1 provides examples of human factors that should be considered when planning activities. The human factors listed are not in priority sequence.

Table 2.6.1 Human Factors

	Human Factors	Considerations
	Risk Tolerance • Personal experience • Age • Education • Training • Complacency	• Accepted practices at other locations • Demographics • Societal cultures • Societal tolerances • Hesitation to seem afraid • Excessive emphasis on productivity • Pressure from superiors • Lack of awareness of the risks • Overconfidence in safety systems • Work history • Self-destructive behaviors • Substance abuse • Leadership

	Human Factors	Considerations
	State of Mind (Emotion) • Distracted • Focused • Psychology	• Distraction of holiday seasons or time just before or after breaks • Private life concerns (monitory, family, job instability) • Mental health conditions (depression, anxiety, etc.) • Interpersonal conflicts • Distraction by specific task • Distraction by Cellular phone or electronic devices
	Senses • Smell • Vision (Illumination) • Hearing • Touch • Taste	• Color confusion • Hearing degeneration • Past injuries • Corrective lenses • Accents and vernacular inconsistencies • Odor tolerance/ inability to differentiate • Desensitization • Depth perception • Overpowering of senses
	Communication Skills • Written • Verbal • Hand signals • Communication Avenues – radio systems, cellphones, email	• Literacy/illiteracy • Language barriers • Trade names, technical language • Communicating in challenging environments • Lack of competency with communication equipment • Illegible writing and notes • Failure to follow or understand communication systems (i.e. Lockout) • Fear of speaking out or in groups • Inconsistent or lack of knowledge of the hand signals used in the operation
	Comprehension • Education • Previous schooling • Personality type	• Words with multiple meanings • Language barriers • Misunderstanding • Technical language • Use of slang • Use of symbols • Use of acronyms – industry and personal

	Human Factors	Considerations
	Culture • Organizational • Previous Company experience • Ethnic background • Accountability	• Leadership • Safety Culture – Compliance, Reactive, Proactive • Demographics • Societal cultures • Societal tolerances • Inappropriate reward structures • Desire to be accepted • Desire to please customers • Aversion to questioning authority • Past encouragement for risk taking
	Ergonomics • Workplace design • Human/Machine interface	• Different body types • Different strength levels • Repetitive motions • Driving for long periods
	Competency • Knowledge • Skill • Desire • Understanding of job requirements	• Past experience • How long has it been since the task was last performed • Fear of admitting lack of knowledge • Desire to please supervisor and coworkers • Not knowing what you don't know • Not having all the facts before deciding competency • Desire outweighing skill • Verification