2. HAZARD ASSESSMENT

**This information does not take precedence over The Saskatchewan Employment Act and related regulations, or any other governing legislation. All worker should be familiar with the legislation applying to them in their workplace.*

Definitions

administrative controls: changes in work procedures such as written safety policies, rules, supervision, schedules, and training with the goal of reducing the duration, frequency, and severity of exposure to hazardous chemicals or situations. Examples include:

- rotating workers through various job assignments so that they do not develop repetitive motion injuries
- requiring workers in hot environments to take breaks in cool rest areas and providing fluids for rehydration
- prohibiting worker access to areas involving hazards such as energized electrical equipment, or excessive noise
- proper housekeeping; reducing clutter reduces the chances for an accident and minimizes the effects if an accident does occur

critical task: a specific element of work which has produced, or may produce, major loss (people, property or financial) when not properly performed (for example: a lift performed with an overhead crane)

engineering controls: controls which eliminate or reduce exposure to a hazard through the use or substitution of engineered machinery or equipment. Examples include:

- ventilation systems such as a fume hood
- sound-dampening materials to reduce noise levels
- radiation shielding

hazard: any activity, situation or substance that can cause harm. Occupational hazards re divided into two broad categories: (1) health hazards, and (2) safety hazards. Generally, health hazards cause occupational illnesses, such as noise-induced hearing loss. Safety hazards cause immediate physical harm, such as cuts, broken bones, etc..

hazardous: *"likely to cause harm or injury in certain circumstances"* [Reg 2(1)(ff)]

hazard assessment (also called Job Hazard Analysis ["JHA"] or Job Safety Analysis ["JSA"]): a thorough examination of an operation or work area (a specific task, a job site, shop, etc.) for the purpose of identifying what actual and potential hazards exist

incident: an unexpected event which results in damage or injury (accident), or which could have resulted in damage or injury (no loss occurrence or "near miss")

occupational illness: a condition that results from exposure to a chemical or biological substance, a physical agent (an energy source such as noise) or other stressors (such as harassment, work demands, etc.) capable of causing harm. The time that it takes an illness to develop after exposure to a health hazard is called the "latency period".

probability: the chance that a hazard will cause harm. In risk management systems, probability is often categorized as:

- frequent (workers are frequently at risk)
- probable (the hazard is likely to cause harm)
- occasional (workers are occasionally at risk)
- remote (the hazard could cause harm, but is very unlikely to do so)
- improbable (the hazard is unlikely to ever cause harm)

risk: the odds that a hazard will cause harm. It refers to the probability and severity of potential accidents and dangerous occurrences (so called "near misses" or no-loss occurrences). Risk management is a technique used to identify and control risk caused by hazards.

risk analysis: the combination of identifying hazards and assessing their risk. Risk analysis can help committee members and the employer to set priorities. Risk is calculated by using the formula: **Risk = Probability x Severity**. Normally, hazards with the highest risk that affect the most workers should receive the greatest attention.

safeguard: *"a guard, shield, wire mesh, guardrail, gate, barrier, safety net, handrail or other similar equipment that is designed to protect the safety of workers, but does not include personal protective equipment"* [Reg 2(1)(aaa)].

severity: the seriousness of the harm that could result from contact with a hazard.

Introduction

The health and safety of workers depends on the employer and workers working together to identify, assess and control hazards. Hazard assessment is a ***PLANNING TOOL*** -- it is an objective process for the examination of possible losses resulting from workplace hazards, changing conditions or systems failures. The type of loss might be human, or one of equipment or material. Hazard assessment does not deal strictly with things that are wrong at the present time - the goal of the process is to identify, assess and control potential risks ***BEFORE WORK BEGINS***. Assessment must deal with ***WHAT COULD GO WRONG***, and should be conducted any time there is a change in working conditions, materials, processes or environment. For example:

- setting up on a new job site,
- moving to a new work area on the job site (any time there is a change in the physical conditions under which the work is being performed),
- before a "critical task" (such as a lift) is undertaken, and
- when using new or unfamiliar machinery or equipment

The hazard assessment process involves gauging the impact and probability of occurrence, and is used to determine whether a situation or condition is safe, and whether conditions, situations or facilities are acceptable in that the degree of risk is minimized to its lowest common denominator. Hazard assessments need to be performed for jobs or areas that involve frequent and/or severe injuries, and for jobs that are new, recently changed or seldom performed. **Hazard assessments must be documented**.

Types of Hazard Assessments: Although hazard assessment levels and triggers differ, the process is completed using one of two instruments - the Hazard Assessment Report (broad scope) or the Field Level Hazard Assessment (task specific, daily requirement for all work being performed). At NexGen Mechanical Inc., there are three basic types of hazard assessment:

- **Pre-job Assessment** (documented on the Hazard Assessment Report): This assessment should be prior to starting work on a new job site.
- **Change-of-Scope (Milestone) Assessment** (documented on the hazard assessment report for project work, and the Field Level Hazard Assessment for service work): This assessment is conducted at a specific milestone where new hazards are introduced (such as the introduction of new and unfamiliar equipment, moving work from ground level to an elevated work area where fall protection is a consideration, or when utilities on the job site go live.)
- **Field Level Hazard Assessment** (FLHA): This assessment is associated with any actual task or job and is conducted and documented at the beginning of each work day and repeated if tasks or hazards change throughout the day.

Project Work: The job lead is responsible to conduct and document the FLHA process in the immediate work area, and to ensure all workers involved in the work review and sign the FLHA.

Service Work: Each service technician is responsible to conduct and document the FLHA process at the beginning of each day, based on expected hazards. If unforeseen hazards arise during service calls, an updated or new FLHA must be completed. Where more than one service technician is involved in any call(s) during the day, each technician involved must review and sign the FLHA.

FLHA Reviews: FLHA spot reviews (i.e. a cross-section of FLHAs should be reviewed - not necessarily all) are conducted at least weekly to ensure hazard identification and control measures are appropriate to the work being performed - project work FLHA reviews by the Project Manager, and service work FLHA reviews by the Service Manager.

When performing work on a site where the customer has implemented a formal hazard assessment process (for example a Safe Work Permit, Ground Disturbance / Excavation Permit or similar) which NexGen Mechanical Inc. is required to use, that process serves as the hazard assessment. On any site where a customer assessment process is not in place, NexGen Mechanical Inc.'s own hazard assessment (or FLHA) process must be completed and documented.

Steps in the Hazard Assessment Process

Managers, job leads and workers should be involved in the hazard assessment process. Keep asking the question "**What if...**?". The knowledge and experience of the people conducting the assessment is of vital importance. All workers must be trained in the hazard identification system and any control measures in place specific to their jobs, including the use, care and limitations of PPE appropriate to the hazards identified.

1. **Identify the hazards**. Identification of hazardous conditions may be accomplished at the planning and design stage, as a result of workplace inspections, or by worker reports. There are four major workplace components which must be considered - these components are:
   - PEOPLE - consider all individuals who may come in contact with the work process, including workers, visitors, clients, suppliers, subcontractors, the public, etc.
   - ENVIRONMENT - consider the work area and surrounding conditions
   - MATERIALS - consider the hazards that may be inherent in the materials involved in completing the work

- EQUIPMENT - consider the tools and equipment that will be used to perform the work

What types of safety issues have been encountered, or could reasonably be expected to arise, in connection with these things?

If an identified hazard may be immediately dangerous to life and health (IDLH), only those workers competent in correcting the condition, and the minimum number of workers necessary to correct the condition, may be exposed to the hazard. Every reasonable effort must be made to control the hazard while the condition is being corrected.

2. **Assess Risk & Set Priorities**. Establish priorities by determining the level of risk posed by each identified hazard. Ask these questions:
   - How likely is the hazard to cause loss?
   - Under what conditions is loss likely to occur?
   - How quickly could an unsafe condition arise?
   - What type of loss is involved (injury, damage, loss of production, etc.)?
   - How many workers could be hurt and/or how much damage could occur?
   - Is there a history of problems, accidents or dangerous occurrences resulting from this hazard?

   COMMUNICATE THE RESULTS OF YOUR ASSESSMENT TO THOSE WHO COULD BE AFFECTED BY THE HAZARD!

3. **Select, develop and implement controls**. Hazard assessment is meaningless unless effective controls are developed and put in place. Control means removing the hazard or reducing its risk of harm to an acceptably safe level. Identify the measures necessary to prevent the known negative circumstances from arising (how can things be prevented from going wrong?). Identify the measures necessary to protect resources from harm or loss in the event of potentially uncontrollable hazards (how do you protect people, equipment, material or the work environment if things go wrong or if the exposure to the hazard is unavoidable?).

An effective control must meet four standards:

1. It must adequately prevent the hazard from causing harm.
2. It must protect everyone who could be harmed by the hazard.
3. It must not create new hazards, or production and quality control problems. (If it does, employees may be tempted to subvert it).
4. It must not create a hazard to the environment or public outside of the workplace.

The closer a control is to the source of the hazard, the better.One type of hazard control may not be completely effective. A combination of several different types of hazard controls often works well.

1. **Engineering Controls** (remove the hazard): This is usually the most effective form of hazard control because you attack the hazard at its source, often eliminating it altogether. Two criteria may be applied to determine whether engineering controls are feasible (*reasonably practicable* as defined by OH&S).

   - a control is technologically feasible if it is available "off the shelf" or if technology exists which can be adapted to the hazard; and
   - a control is economically feasible if it can be shown that the cost of the control is justified by the benefit it produces.

   Engineering controls include measures such as:

   - elimination – getting rid of a hazardous job, tool, process, machine or substance
   - substitution – replacement of an existing process, material or equipment with a similar item having more limited hazard potential
   - redesign – redesigning the layout of the workplace, workstations, work processes and jobs to prevent ergonomic hazards
   - isolation – placing an appropriate barrier between the hazard and the worker(s)

2. **Administrative Controls** (separate the worker from the hazard): This type of control limits workers' exposures, has many limitations because the hazard itself is not actually removed or reduced. The control only reduces the risk of the hazard injuring the worker and lessens the potential seriousness of an injury. Administrative controls include:

   - job rotation, scheduling, access restrictions – reducing the time that workers are exposed to a hazard
   - safe work practices and job procedures, training and supervision

- emergency planning
- housekeeping and preventive maintenance
- signs and tags – to increase the worker's awareness of potentially hazardous situations

3. **PPE** (protect the worker from the hazard): This is the last line of defense, and is much less effective than engineering controls since it does not eliminate the hazard, and should only be used:
   - when other controls aren't feasible (for example, to protect workers from noise exposure when using chainsaws);
   - where additional protection is needed; or
   - where the task or process is temporary (such as periodic maintenance work).

   PPE must be used properly and consistently to be effective. Awkward or bulky PPE may prevent a worker from working safely. In some cases, PPE can even create hazards, such as heat stress. Nevertheless, there are instances where adequate levels of risk reduction cannot be achieved through other methods, and personal protective devices must be used, either alone or in conjunction with other protective measures.

> *All PPE used must meet recognized industry standards (for example Canadian Standards Association [CSA], National Institute of Occupational Safety and Health [NIOSH] or American National Standards Institute [ANSI]), and must be used and maintained in accordance with the manufacturer's instructions. All workers must be trained in the use, care and limitations of the PPE they are required to use.*

4. Monitor and follow-up! Sometimes hazard controls do not work as well as expected. The company must monitor the effectiveness of the corrective action taken during inspections and other regular safety activities. Ask these questions:

- Have the controls solved the problem?
- Is the risk posed by the original hazard contained?
- Have any new hazards been created?
- Are new hazards appropriately controlled?
- Are monitoring processes adequate?
- Have workers been adequately informed about the situation?
- Have orientation and training programs been modified to deal with the new situation? Are any other measures required?

USING YOUR SENSES IS NOT ALWAYS A SAFE WAY OF DETECTING HAZARDS.

Many hazardous agents and conditions cannot be detected with the senses. Others, such as hydrogen sulfide (H_2S) gas, are often dangerous when strong enough to be detected in this way.

Worker Hazard Assessment Checklist: Before starting a job or task, each worker should:

Identify the Hazards: Ask yourself the following questions about the job to be done:

- Is the area safe to work in?
- Do I clearly understand my task?
- Am I physically and mentally prepared to do my task?
- What could go wrong?
- Is there a risk to others or to me?
- What can change that could create a new risk?
- Could other crews, workers or conditions pose risks to me?
- Do I have the right tools and equipment to do this task?

Report Hazards: Identification and reporting of potentially unsafe working conditions is the responsibility of all workers. All workers are encouraged to report unsafe conditions to the job lead or manager as soon as they are identified.

Implement Controls: For each risk identified, ask yourself:

- How likely is this to happen and how bad could it be?
- What must I do to control the risk?
- Will that control measure affect another part of the task being done?
- Who should I contact if I need help?
- Do I need anyone else?
- Is a safe work practice or job procedure required for this job?

Provincial legislation provides for a worker to refuse any work he or she feels to be unusually dangerous. Do not proceed with the work unless you are satisfied that it is safe to do so.

Critical Task List

A critical task is a specific element of work which has produced, or may produce, major loss (people, property or financial) when not properly performed. The company has identified certain activities that we regularly perform as critical tasks; these tasks include:

- moving rooftop equipment (Dolly Lama)
- elevated work involving fall protection equipment
- Hole Hawg use
- pipe freeze kit use
- rigging
- confined space entry (only non-hazardous confined space entry is permitted)

There are numerous other activities performed during the course of our work which would fit the definition of a "critical task". As these activities are identified, job procedures will be developed to address the specific hazards presented by the specific element of work. Where it is expected that the identified critical task will be performed in the future, the job procedure will be added to the safety manual.