Hazard Management Program

PURPOSE:

To reduce the risk of loss, by identifying and controlling exposure to hazards.
To ensure that all hazards are adequately controlled.

PROCESS:

Hazard assessment is a four-step process of:

1. Identification
2. Assessment
3. Controlling
4. Monitoring

This process can be started at any point, as it is a continuous cycle. However it is usually begun at the identification step.

IDENTIFICATION

Critical Tasks

Critical tasks are those that, if not performed correctly, would lead to unacceptable consequences (injury, property or financial loss, or environmental damage).

Steps to creating the Critical Task List:

1. List the job categories (Operator, mechanic, foreman, etc.).
2. Break each category down into tasks. (pigging, chart reading, etc.)
3. Identify the purpose of the task.
4. Define the parameters of the task
    - Required competencies - Training, skills, knowledge that employee should have before attempting task.
    - Work environment - Where does the task occur, what are some of the variables (other activities, weather, etc.)
    - Personnel - Who will do the work, under whose authority?
5. Categorize the task
    - New – A Task never before done.
    - Operational Changes – A task that has been done before but not under these conditions. (Assessment or procedure does not take into account new conditions)
    - Current - Existing procedure or previous assessment exists, but is more than 3 years old
    - Low-risk task – There is no risk anticipated in this task.
6. Evaluate the risk
    - Determine the outcome of the task if it is not completed properly ('What if' analysis)
    - Determine the likelihood of the task not being completed properly

- Assess the risk using the risk matrix (likelihood and consequence)

7. Identify those tasks that exhibit risk greater than the acceptable limit.

8. Rank those tasks in risk order (highest to lowest)

Once these “critical” tasks are identified the assessment can begin. Only those tasks that are deemed critical are further assessed.

ASSESSMENT

Create Assessment Team

The team is comprised of individuals who will have a direct involvement in performing the task. For lower risk tasks a single individual is adequate. For most assessments the team would be comprised of the following:

- Competent individuals who will perform task
- Special knowledge (technical, legislative)
- Supervisor responsible for task completion

Break task into steps

Break the task into smaller steps. For instance “Sending a pig” can be broken down into the steps of: Isolate the line, drain the sender, open the sender, insert the pig, close the sender, etc.
During this phase ensure you identify:

- Purpose (goal) of task
- Critical steps (if not done right the task fails to meet the goal)
- Timing
- Location
- Other operations that may impact (and vice versa)

Identify hazards

For each step identify the potential hazards. Consider the effects of performing the step incorrectly or omitting it entirely. Ensure you have considered People, Equipment, Materials, Environment and Process. (Refer to the hazards and effects chart for assistance)
Other tools to assist in this are:

- Failure Modes analysis
  - A process where the consequences of a piece of equipment failing or a step done incorrectly is identified.
- What If analysis
  - A process where the question “What If?” is asked repeatedly to identify potential hazards.

Assess the Hazards
Once the hazards are identified, they are ranked using the risk matrix and those that are at an unacceptable risk level are addressed with controls to bring the risk down to acceptable levels.

CONTROLS
Each hazard will require some form of control. Be aware that one control may resolve one hazard but create another. Keep in mind the concept of ALARA (As Low As Reasonably Achievable). There are three main types of controls to use to reduce the risks. The controls are identified in each individual task in this manual.

Engineering controls
These should be the first controls to be looked at. Engineering controls reduce the risk of exposure to the hazard by reducing the likelihood that the hazard will be encountered in the work place. They include:

- Elimination
- Substitution
- Barriers or guards
- Ventilation
- Ergonomics

Administrative controls
Administrative controls do not reduce the likelihood that the hazard will be encountered in the workplace but are designed to reduce the effect of the hazard. They include:

- Job rotation
- Procedures
- Training
- Education

Personal Protective Equipment
This should be the control of last resort, as it does nothing to control the hazard but focuses on reducing the effect of the hazard on the individual wearing the PPE. They include:

- Hard hat
- Gloves
- Glasses or Goggles
- Fire retardant clothing
- Respiratory protection
- Fall protection
- Hearing protection

Monitoring

Once you have completed the risk assessment they are incorporated into this manual and the Results of the assessment must be shared with all potentially affected employees. Reviewing at a field HSE meeting would be an ideal forum to accomplish this.

Monitoring methods include:

- Incident reports
- Inspections
- Job Observation/Competency evaluation

Any gaps identified are fed back in to the top of the loop and the process repeats.

COMPETENCY EVALUATION

What is competency?

- Can be defined as the sum of experience and knowledge.
- Can be obtained by training and education. Must be confirmed by either observation or detailed discussion when it is not practical to complete observation.

Control of the risk is only achieved through confirmed competency on specific tasks.

A needs assessment (competency assessment) is used to determine if current training is adequate to provide sufficient risk control. Gaps are identified and processes put in place to close those gaps.

Competency gaps can be the result of a lack of knowledge or lack of skill.

- Lack of knowledge is addressed through education (information).
- Lack of skill is addressed through training (practice, hands-on).

In either case confirmation is required to ensure the gap has been closed.
Typically confirmation is achieved by testing the knowledge (written test) or the skill (practical demonstration of ability).
Someone who is already competent in the task being assessed must supervise the skill test.

JOB/TASK OBSERVATION

Task observation is a five-step process to evaluate the effectiveness of hazard controls.
The five steps are:
1. Preparing
2. Observing

3. Discussing
4. Recording
5. Following-up

Preparing
Task observation should be planned in advance. The number of observations, the task and individuals to observe should be plotted out in advance to ensure that an adequate assessment of the controls is achieved. A review of the hazard assessment and the controls required for the task should take place in advance of the observation.

Observing
Stay out of the way of the task at hand. Preferably out of the line of site (minimize
distractions). Do not interrupt the task unless you see a serious incident or loss in the making. Stay focused on the task. Relate what the person does to the proper task procedure.
Make notes for the follow-up.

Discussing
Whenever possible, talk to the worker immediately following the observation. In this feedback contact do at least the following four things:
1. Thank the person for helping with the observation program
2. Ask questions and review any points necessary to make sure you understand all vital aspects of what you have observed (the observed behavior may vary from the expected behavior for valid reasons.)
3. For any worker behavior requiring immediate correction, give on-the-spot feedback and instruction.
4. For exemplary behavior, give on-the-spot recognition and reinforcement.

Recording
Documenting the observation assists in improving the overall program and implementation of the controls. A standard observation form should be used to capture the relevant data.

Following-up
Perhaps the most critical aspect of the observation process. If poorly done or not done at all the observation becomes more of a hindrance to improved safety. Corrective coaching and re-instruction should be positive. Tell the why of a suggestion or procedure (the benefit). The follow-up should also be used to ensure that the employee is meeting the performance requirements (should there have been some gap).

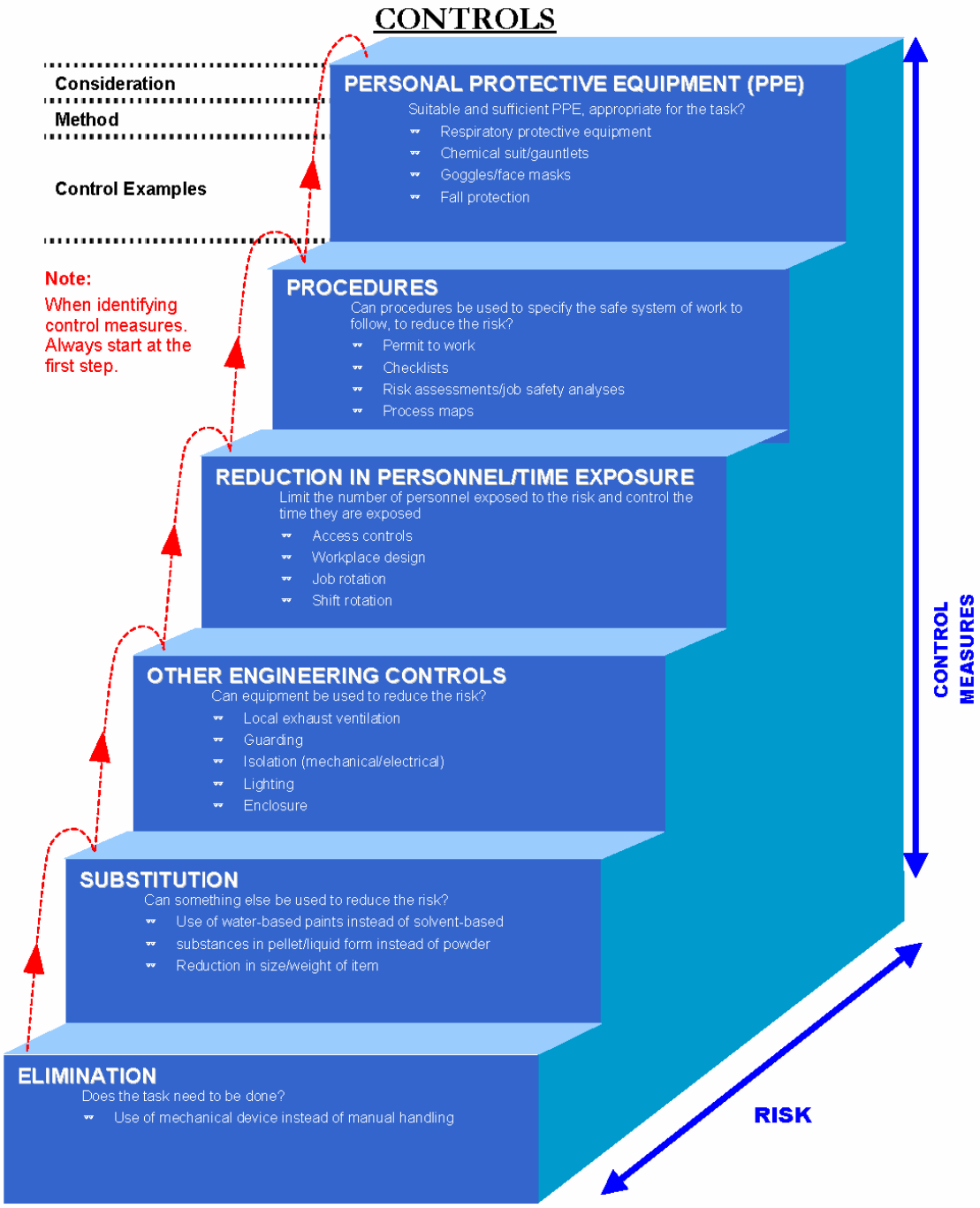
RISK MATRIX

Potential Consequences of the Incident				Likelihood of the incident happening			
				A	**B**	**C**	**D**
Severity Index	**People**	**Environment**	**Asset**	Very Unlikely Little or no Chance of Occurrence	Unlikely Could Occur Less than 50 / 50 Chance	Possible 50 / 50 Chance	Probable, More likely to Occur than Not.
1	Slight Injury	Minor Effect	<$1K	**LOW**	**LOW**	**LOW**	**LOW**
2	Minor Injury	Moderate Short Term Effect	<$15K	**LOW**	**Medium**	**Medium**	**Medium**
3	Major Injury	Moderate Long Term Effect	<$250K	**Medium**	**Medium**	**HIGH**	**HIGH**
4	Fatal or Permanent Disability	Serious Effect	>$250K	**HIGH**	**HIGH**	**HIGH**	**HIGH**

If an incident had a 50/50 chance of resulting in a major injury it would be classed as a “C3 (people)”. If an incident were very unlikely to result in a minor effect to the environment it would be classed as an “A1 (environment)”

Hazards and Effects Chart

EXAMPLE	HAZARD CONSIDERATION	HAZARD EFFECT Personal injury, environmental impact, property damage
PEOPLE	1. New/inexperienced personnel 2. Visitors/unauthorized personnel 3. Inadequate communications 4. Insufficient numbers 5. Competence	Information/Instruction/Supervision • Slips trips and falls • Fire • Exposure to hazardous substances • Toxic • Corrosive • Irritant • Carcinogenic • Sensitizing • Exposure to noise • Explosion • Burns • Hypothermia • Shock • Struck by objects • Exposure to ionizing radiation • Entanglement • Impact • Crush • Cuts/abrasion • Entrapment • Electrocution • Asphyxia • Drowning • Stress • Pollution • Contamination • Financial liability
EQUIPMENT	1. Scaffolding/ladders 2. Incorrect use of tools 3. Stability/collapse of equipment 4. Maintenance 5. Equipment failures 6. Damaged/faulty equipment	
MATERIALS	1. Hazardous substances 2. Radioactive substances 3. Flammable 4. Explosive substances 5. Dimensions weight 6. Waste	
ENVIRONMENT	1. Confined spaces 2. Working at heights 3. Noise 4. Temperature 5. Lighting 6. Ventilation 7. Vibration 8. Weather	
PROCESS	1. Emergency arrangements 2. Incorrect procedure process 3. Inadequate safety management system 4. Inadequate planning 5. Lack of training 6. Lack of	


CONTROLS
Consideration
Method
Control Examples
Note:
When identifying control measures. Always start at the first step.
PERSONAL PROTECTIVE EQUIPMENT (PPE)
Suitable and sufficient PPE, appropriate for the task?
Respiratory protective equipment
Chemical suit/gauntlets
Goggles/face masks
Fall protection
PROCEDURES
Can procedures be used to specify the safe system of work to follow, to reduce the risk?
Permit to work
Checklists
Risk assessments/job safety analyses
Process maps
REDUCTION IN PERSONNEL/TIME EXPOSURE
Limit the number of personnel exposed to the risk and control the time they are exposed
Access controls
Workplace design
Job rotation
Shift rotation
OTHER ENGINEERING CONTROLS
Can equipment be used to reduce the risk?
Local exhaust ventilation
Guarding
Isolation (mechanical/electrical)
Lighting
Enclosure
SUBSTITUTION
Can something else be used to reduce the risk?
Use of water-based paints instead of solvent-based
substances in pellet/liquid form instead of powder
Reduction in size/weight of item
ELIMINATION
Does the task need to be done?
Use of mechanical device instead of manual handling
CONTROL MEASURES
RISK