# HAZARD AWARENESS TRAINING IN MANAGING OPERATIONAL RISKS

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## INTRODUCTION

Planned General Inspections (PGI) constitute a basic building block of a safety, health, environment and risk management system. They provide a program of systematic examination of facilities, equipment, material, and employee activities. During many years of undertaking inspections, audits and surveys our experience has been that outsider inspectors spot hazards that seem obvious but are missed by the more knowledgeable plant personnel. Most major industries have internal and formalised inspection programs, but their effectiveness in finding hazards is limited to housekeeping issues. The non-obvious and more serious hazards are missed. Here we discuss methods to revitalise your hazard awareness by the onsite staff.

## PURPOSE

To identify and address hazards and non-conformances, including personnel exposures, substandard conditions, and practices and to determine the responsible person for developing appropriate corrective actions to minimise the potential for loss.

Plant personnel focus on operating performance. Although, they have greater practical awareness of risk they sometime do not see the obvious potential hazards.

## ELEMENTS

Each business/facility should:

1. Have a written planned General Inspection Program (PGI).

2. Conduct regular inspections of the entire workplace at appropriate frequencies. Inspections will include:

    a) Housekeeping
    b) Process equipment
    c) Safety equipment
    d) Environmental equipment
    e) Potential exposures
    f) Substandard conditions
    g) Practices versus procedures
    h) Ergonomic conditions
    i) Status of findings from previous inspections

3. Document corrective actions for all inspection items and assign responsibility and set completion dates.

4. Communicate inspection results to appropriate employees.

5. Implement a process for follow-up on corrective actions until they are completed.

6. Evaluate the planned inspection program periodically to determine the program's effectiveness.

7. Retain inspection reports for the twelve previous months.

8. Conduct an annual trend analysis of findings.

## Past Experience:

After construction and start-up of a major facility in 1979, much construction debris, incomplete work and housekeeping deficiencies were noticed. Some of these resulted in fires caused by cardboard boxes igniting off the hot superheated steam piping, or lube oil leak near steam turbines etc. Management implemented weekly general inspections to improve appearance and reduce such losses.

Although there was an improvement on appearance and the number of fires were reduced, these inspections became 'housekeeping' in nature and there was elements of hit and miss in picking up hazards throughout the site. The focus was on: trash containers, storage cabinets, hose racks, ladder racks, missing insulation, etc..

The problems with these 'housekeeping' inspections were that it tried to cover the entire site and took a long time (over 2 hours) to complete. Although, the general appearance improved it provided no opportunity to learn between different participants and it did not address the more non-obvious and in some cases more serious hazards.

The general inspection program was revised dividing the plant site into 26 much smaller portions to increase the focus of the inspectors. The inspection period was reduced to 30 minutes and scheduled on weekly basis.

Everyone in the unit was scheduled with no one expected to undertake two inspections in a row. A multi-disciplinary team of operator, maintenance, technical and process engineers and EH&S leaders and senior management were all involved.

The results of the revised program were that the inspections are done weekly, and no one felt overburdened. Their load was shared and the underlying problems were addressed. The site continued to look good and employees took more pride in the workplace. Many items were captured: such as, mechanical pipe supports and hangers, spring hangers, equipment grouting, equipment and pipe vibration, liquid hydraulic hammer, corrosion etc.

The inspection program was augmented with Hazard Awareness Training to increase the knowledge base of the staff. This training covered following areas: Operational, Maintenance, Design and Loss Prevention. Reviews of incident loss databases highlighted numerous areas were Hazard Awareness Training would be most beneficial, such as:

- Layout & Location
- Spacing
- Fireproofing
- Coating & Insulation
- Bolting
- Piping Systems
- Freezing
- Dead Legs
- Gasket & Mechanical
- Excessive Temperature & Pressure
- Corrosion & Erosion
- Storage & Handling of Flammable & Toxic Gases, Liquids and Solids
- Sub-standard Material
- Confined Space Entry
- Detection & Alarm
- Emergency Response
- Pressure & Vacuum Relief
- Impairment of Protection System
- Transformers
- Electrical Nonconformance
- Hazardous Area Classification
- Personnel Protection Safety
- Housekeeping
- Labeling
- Lock Outs
- Work Permit
- Welding & Cutting
- Filling & Emptying

A formalized Hazard Awareness Training course was structured into five sections of core learnings:

- **Fixed Fire Protection & Emergency Response**
  - *Detection, Extinguishers, Alarms, Water Deluge, Sprinklers, Testing, Coverage, Responding, ER equipment...*
- **Equipment**
  - *Pressure Envelop Protection, Small Bore Piping, Piping systems, Corrosion, flexible piping,. . .*
- **Electrical**
  - *Area Classification, Electrical fittings, Purging...*
- **Passive Protection**
  - *Spacing, Layout, Fireproofing, Drainage, Bollards ,..*
- **Human Elements, Procedures & Personnel Protection & Safety**
  - *Labeling, Work Permits, MOC, Task Order, Ladders, Personnel Protection equipment, ..*

The Hazard Awareness Training course was delivered per the following plan:

- **Loss Prevention Survey of Site**
  - *Identify Potential Hazards & Non-Conformances*
  - *Positive features*
  - *Incorporate into Course*
- **Slide Presentation Highlighting Lessons Learned**
  - *Site specific Deficiencies*
  - *Pictorial Lessons Learned from Past Incidents*
  - *Sharing of Code and LP knowledge*
- **Plant Inspection Tour with Participants**
  - *Makeup Inspection teams*
  - *Random Selection of an Area*
  - *Scribe to Identify deficiencies*
  - *20 - 30 minutes*
- **Review Results of Plant Inspection**

Pictures of hazardous situations are used to provide visual emphasis and are tied to loss examples when ever possible.

The Plant Tour comprises of multi-discipline involving operations, maintenance, technical, loss prevention, environmental, management and non-technical support staff. Areas are randomly selected. The inspection interval takes 20 – 30 minutes. Noted deficiencies are identified and shared with the training group. Up to 50 deficiencies have been noted in one 30 minute inspection.

## CONCLUSION

The key to success of a Planned General Inspection (PGI) programs is that the program must allow sufficient time to look at the details of every system. The inspections must include all disciplines and the results must be documented and tracked. The inspections must be conducted at the planned frequency.

Plant personnel begin to act on deficiencies when they start to recognize hazards themselves. Training provides additional knowledge and understanding that can be applied in the field. The facility condition improves as well as risk is managed.