

I&S Guide for Applying Human Performance Tools in Issue Investigations

August 15, 2008 rev 15

What is the problem ?

Why did it happen ?

What can be done to prevent it from recurring ?

Issue Response Sequence for Responsible Manager (RM)

within two hours of occurrence of issue

- * Determines details of issue – what happened, where, when.
- * Determines, directs, and/or evaluates immediate actions taken to ensure the affected process/equipment is in a stable condition.
- * Determines actual impacts of issue.
- * Determines ORPS classification based on issue impacts. Notifies DOE FR and others of issue, impacts, and classification.

within the same shift

- * The RM may convene an initial investigation meeting to review the known facts, the initiating action of the issue (human error, willful violation, equipment failure), the potential causes of the initiating action, the worst case scenario impact (what could have happened but didn't this time?), and extent of condition (do we have this same/similar problem elsewhere?). If RM determines human error as the likely initiating action of the issue, a HPI-based Fact Finding meeting (FFM) and causal analysis to determine probable causes may be planned. The new site HPI-based disciplinary matrix is available to assist and guide the manager's assessment of intent. If the RM determines a FFM is needed (based on nature, complexity, and impacts of the issue), the RM designates a FFM Director and incident investigator (or investigation team) and confers with them to determine critical fact finding actions needed to be completed within the shift or first 24 hours (such as personnel statements, time lines, documentation, etc). The RM notifies DOE Facility Representative and others of fact finding meeting plans. If the RM determines return to normal operations is contingent on the outcome of the FF meeting, the RM may expedite preparation and fact finding efforts to support a more timely FF meeting.

between same shift and first 48 hours

- * When collection of the relevant facts are completed or are anticipated to be completed by a known timeframe, (normally within 48 hours of the issue), the RM/FFM Director schedules the Fact Finding meeting.

Preparations for Fact Finding Meeting

- * Confirm with the responsible manager that human error was involved rather than willful violation. A HPI-based analysis may be inappropriate for an issue involving willful violation.
- * Work with responsible manager and others to get timeline documented before the fact finding meeting.
- * Meet with those directly involved with the issue before the fact finding meeting to go over the HPI process and to get their perspective of the issue and what they were thinking and paying attention to when the issue occurred. Meeting those involved at the field location of the issue may help in the identification of error precursors. Write up the issue description and initiating actions ahead of time when possible.
- * Confirm meeting notification is sent out and appropriate DOE and DNFSB reps are invited.
- * Encourage use of pictures as part of timeline supplemental info.
- * Request copies of implementing work documents associated with the issue for use in the meeting; single lines and component and tag numbers used are important documents if the issue involves lockouts.

Kickoff

Note: Place a blank sheet to the side to capture emerging comments related to other sections of agenda; by capturing them, the commenter will be more willing to defer further discussion until later, per the agenda

- * Introductions
- * Route sign up sheet (name, job function/org, tel no.); will be used to issue draft minutes

Review purpose of meeting

- * Purpose is NOT to embarrass anyone or place blame
- * Purpose IS to understand
 - what happened,
 - why it happened,
 - and what can be done to prevent it from recurring

Note: the tone of the meeting should reflect an attitude towards the worker(s) who erred that “Our system allowed, or failed to accommodate, your mistake . . . let’s improve our system”.

- * Optional - discuss incident triangle and how learning from small issues can prevent future big issues.
- * Review agenda

AGENDA

Description of issue and immediate response

- * what happened (this describes the unexpected, unwanted condition)
- * when
- * where
- * immediate actions and notifications taken after issue (may be in timeline)

Evaluation of actual impact and potential impact (worst case scenario) on business goals

- * impact on safety, environment, CONOPS/compliance, customer, operations, cost, site reputation
- * worst case scenario – what could have happened, but didn't this time
- * reportability category

Review of work activity to gather all relevant facts

* **Process system description, process layout, single line, pictures** - Provide description/overview of the activity and operating condition of the facility and equipment processes being used immediately before and during time of work performance; a single line and component identification numbers is important when the issue involved lockouts and other component manipulations.

* **Scope of work** – if applicable, discuss scope of work and any issues related to scope to ensure complete understanding.

* **Timeline** - Describe the sequence of activities that lead up to the issue; stick with timeline format – date, time, who (function) took what action, then ask “what happened next”; do not allow strip charts, logs, or other means to serve as THE timeline – stick with the format above; avoid letting the group analyze activities (asking the Why ? question) during the middle of the timeline, hold them off until timeline is finished and the group is ready to move into the analysis phase.

* **Review related information**

- work processes /controls being used at time of issue, implementing documentation in use (work packages, roundsheets, procedures, logs, lockout plans, drawings), worker quals/experience
- informal work group practices, routines, and protocols in use
 - what happened that day
 - what practice/routine/protocol usually happens (what's the norm) ?
 - what should have happen (what's the stated policy) ?
- identify other relevant facts or information

Causal Analysis

1. Identify the **initiating action** (the behavior - or equipment failure - that directly triggered the issue).

Note: If the initiating action of the issue is an equipment failure, use the root cause analysis process in 1Y-3, Procedure 3.01 "Equipment Root Cause Failure Analysis" to determine the direct cause; in these cases, the human error probably occurred upstream in the development or implementation of the design, operating, or maintenance specifications or practices associated with the equipment; the timeline should extend backwards in time to capture these activities for analysis, if appropriate

2. Using the Anatomy of an Event model, brainstorm apparent causes of the **initiating action**

Note: For Mock Critiques, group should identify error precursors and flawed defenses that have actually occurred in the past or are likely to occur in the work place with this activity.

- * identify **error precursors** that might have provoked the initiating action

Error - Precursor checklist

- | | |
|--------------------|---------------------------|
| - Task Demands | - Individual Capabilities |
| - Work Environment | - Human Nature |

Note: A very effective defense tool in response to error precursors in the work place is self checks – IHA/STAR; keep this in mind in the Corrective Action section.

- * identify **flawed defenses** (processes/tools) that provoked the error and/or failed to catch the error

common defenses that may be flawed or were not applied during issue

- | | |
|-----------------------------|---------------------|
| - procedures/work practices | - training |
| - self/peer checks | - pre-job briefs |
| - labeling/drawings | - repeat back |
| - job scheduling | - alarms/interlocks |

- * discuss extent of condition. Does the flawed defense exist elsewhere ?

- * identify **latent organizational weaknesses** that generated the error precursors and flawed defenses

Are the systems that allowed the error precursors and/or flawed defenses "weak", which means they may allow additional error precursors/flawed defenses to recur ?

Example: a weak procedure development system left uncorrected issues multiple weak procedures, which become causal factors for future issues.

Note: This part of the analysis may need to occur after the meeting is over

3. Identify any trends from past experiences. Identify/discuss processes that produced the above causes . Trends are an indicator of latent organizational weaknesses.
4. Determine if additional data collection, validation, trending and/or causal analysis are required beyond the Fact Finding meeting (particularly for further analysis of latent organizational weaknesses).
5. As another means to look at the causes, use ISMS to identify inadequate elements: Define the work, analyze the hazards, develop and implement hazards controls, perform work within controls, provide feedback and continuous improvement.

Identification of Corrective Actions (CAs)

Note: The Responsible Manager (RM) may choose to proceed with this section as part of the Fact Finding meeting if the causal analysis was deemed complete enough. The RM may choose to dismiss all non-management attendees or may choose to engage some or all attendees in CA identification and planning. If the RM determines the causal analysis is incomplete or requires additional rigor and research, CA planning may be deferred until the analysis is complete.

1. **Risk assessment – Discuss the likelihood of recurrence if no action is taken, and it’s worst case consequences.** Ask the group “is it likely this problem will occur again if no action is taken ? Has it occurred in the past ? What’s the worst thing that can happen if it does recur?” The worst case consequence was discussed up front when the issue was defined.
2. **Identify reasonable actions** that will eliminate/reduce the **initiating action (human error)** by eliminating the causes, i.e., the flawed defenses (including extent of condition) and/or latent organizational weaknesses .
3. Individually and then collectively, **evaluate the costs** of the corrective actions relative to the overall risk assessment and their influence on preventing recurrence. Decide on the CAs to be taken.
4. Assign CA responsibility and target comp dates; use “end of month” calendar days complete dates when possible
5. As needed, identify measures to confirm improvement actions were successful. Management Field Observations can be used reinforce CAs and self assessments can be used to verify effectiveness.

Note: Some CAs may be completed before the final report is issues. When possible, document the completed CAs in the report to prevent unnecessary CA closure paperwork

6. Identify actions to address outcomes of the discussion on extent of condition and latent organizational weaknesses.

Evaluation of immediate actions and notifications, successes, and lessons learned

1. **Evaluate immediate corrective actions and notifications for adequacy**- good practices and weaknesses
2. **Capture what went well** - identify organizational defenses (processes, practices, routines, habits, culture) that worked to prevent or mitigate the issue from being worse. For close calls, near misses, minor issues, some things in the system (defenses) went right to prevent the mishap from being worse. Capture these.
3. **Identify lessons learned**– Did the organization learn something they did not already know as a result of this issue ? Can the results of this analysis benefit others ? Who should the LLs be shared with ?
4. Recognize/thank workers for their openness and willingness to participate and help the organization learn.

At end of Fact Finding meeting

- * capture a title of the issue
- * obtain completed roster
- * confirm issue as SIRIM/ ORPS reportable or non reportable; if there is not a clear consensus on this, defer further discussion to after the meeting is over
- * develop a HPI-based summary script for the line manager to use when reporting the results of the fact finding and analysis meeting in the following day’s morning call

I&S Issue Fact Finding Report Template

Issue Title:

Issue Date:

Issue Time:

Summary:

Immediate actions taken:

Impacts:

ORPS Classification:

Probable Causes based on human factors analysis:

Initiating action (human error):

Probable causes of initiating action:

Error precursors

Flawed Defenses

ISMS causal category:

Corrective Action Items

Fact Finding Director _____

Responsible Manager Concurrence _____ **Date** _____