

# Applying Human Performance Tools to the Investigation of Issues

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# Critique History

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- **Implemented critiques in 1990s**
- **“Inattention to detail” – people as cause**
- **CAs based on consequence**
- **HPI principles began appearing last four years**

# Site Infrastructure Experience

<b>June 2005</b>	<ul style="list-style-type: none"><li>• Utility Operations, Rigging and Transportation, Maintenance Services restructured</li></ul>
<b>Aug 2006</b>	<ul style="list-style-type: none"><li>• Began applying HPI tools in critiques</li></ul>
<b>To date</b>	<ul style="list-style-type: none"><li>• 50+ HPI-based critiques and post job reviews</li><li>• Experiences/LLs rolled into SI HPI-based critique guideline</li></ul>

# I&S Guide

## Issue Response Sequence – Responsible Manager

- **First two hours**
  - Issue definition
  - Immediate actions taken
  - Reportability classification and DOE notification
- **First 24 hours**
  - Determines intent
  - Determines level of effort to find facts and analyze
  - Designates FF director, investigation team
  - Fact finding initiated
- **When collection of facts completed**
  - Schedules FF meeting

# I&S Guide

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## Preparations

- **Meet with those directly involved**
- **Get Timeline started**
- **Review and bring implementing documentation**
- **Pictures, single lines and process drawings**
- **Schedule Fact Finding meeting**
  - Try to limit invitation to those involved and key support people

# I&S Guide

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## Kick-off

- **Introductions**
- **Sign-up sheet for minutes**
- **Review purpose of meeting**
  - What happened
  - Why it happened
  - What can be done to prevent it from recurring

**We are here to learn “why our system allowed, or failed to accommodate, your mistake.”**

Chris Hart, Federal Aviation Administration

# I&S Guide

## Issue Evaluation

- **Description of Issue and immediate actions taken**
  - What, when, where
  - Immediate actions take to place equipment in safe condition
  - Notifications made
- **Evaluation of impact of Issue**
  - Safety, environ., CONOPS, compliance, customer, operations, cost
  - Worst case – what could have happened but didn't this time
- **Reportability**

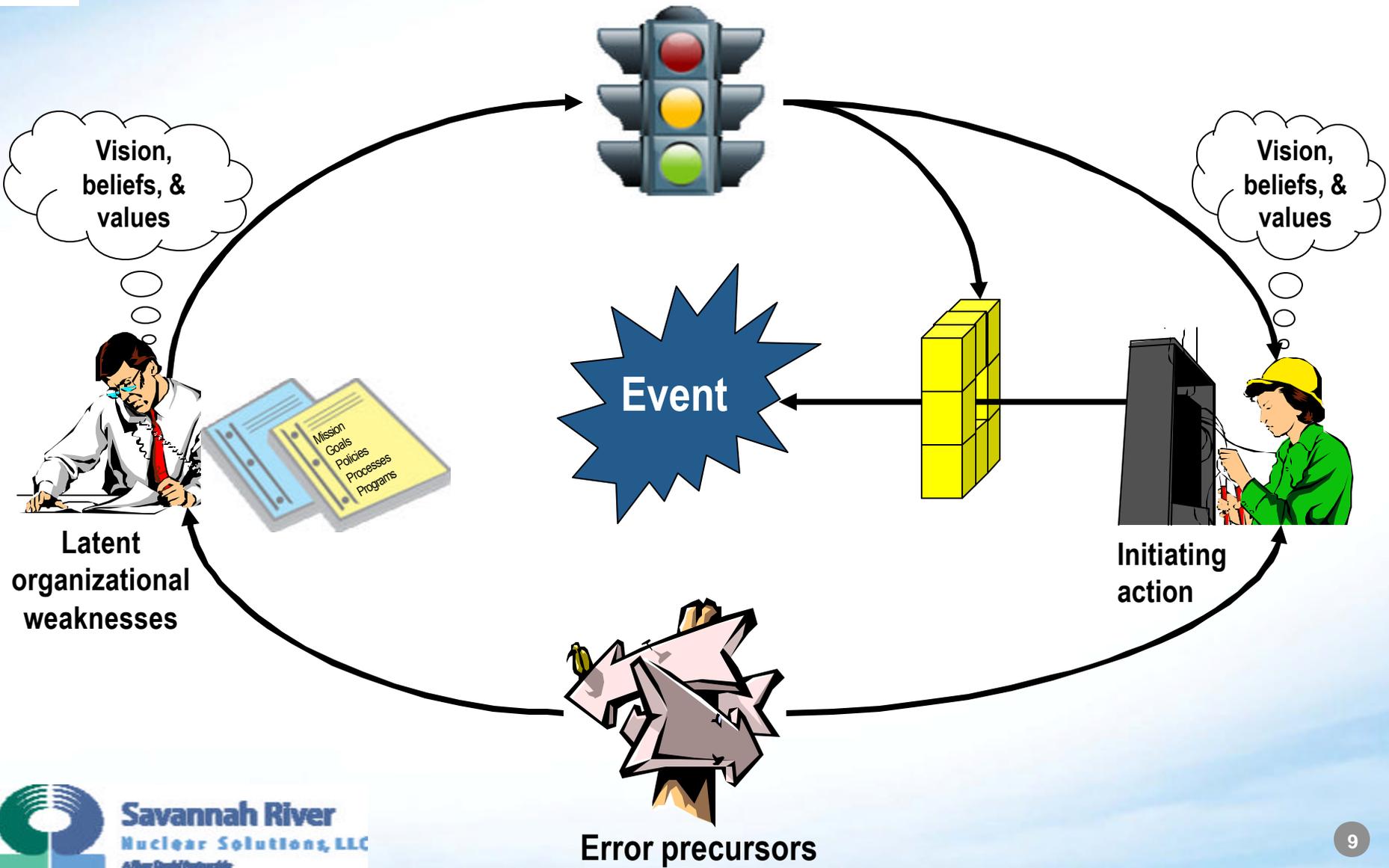
# I&S Guide

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## Fact Finding Review

- **Process description**
  - Pictures, drawings, description of process
- **Scope of work**
  - Work being accomplished at time Issue occurred
- **Timeline**
- **Related information**
  - Work processes being used at time Issue occurred
  - Implementing documentation, worker experience/quals
  - Informal work group practices, routines, protocols in use

# Anatomy of an Event



# I&S Guide

## Human Performance-based Causal Analysis

- **Initiating action - the human error, or honest mistake**
- **Error precursors**
  - Task Demands
  - Individual Capabilities
  - Work Environment
  - Human Nature
- **Flawed defenses**
- **Latent organizational weaknesses**

# I&S Guide

## Corrective Actions and Evaluation

- **Corrective Actions**

- Assess risk
  - Is it likely this problem will occur again if no action is taken ?
  - What's the worst thing that could happen if it does recur ?
- Identify reasonable actions that will reduce probability of recurrence
- Evaluate collective costs to implement
- Means to verify – MFOs, assessments, data collection

- **Evaluation +/-**

- Immediate CAs and notifications
- What defenses kept the issue from being worse ?
- What did we learn that we didn't know before this issue occurred ?

# Case Study

<b>Event</b>	<b>Underground cable severed during installation of guy wire</b>
<b>Impact</b>	<b>No injuries, cable damage ~\$500, compliance issue Worst case – could involve high voltage potential</b>
<b>Initiating action</b>	<b>Hand digging to locate interference not performed as required by site procedure</b>
<b>Error precursors</b>	<b>“In-field” interpretations, lack of clear understanding of policy; unfamiliarity w/task; distractions; inaccurate assumptions</b>
<b>Flawed defenses</b>	<b>Procedure usability, procedure content, communications practices, review/approvals, roles/responsibilities</b>
<b>CAs to minimize recurrence</b>	<b>Refresher training on AHAs and 8Q34; standing order for excavation packages; routine reinforcement of expectations via MFOs</b>

# Results

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- **Reporting of minor issues has increased, allowing more HPI analyses leading to organizational improvements**
- **LOW analysis of 2007 issues fed into 2008 Plan**
  - Understanding and implementation of AHA process
  - Use of self checks/peer checks
  - Accurate risk perception
  - Oversight of high risk routine work
- **HPI-based critiques are seen by employees as “fair”**

# Site Improvements

- **Dropped the term “Critique” - now using “Fact Finding”**
- **Standardized “Issue” term**
- **Graded approach**
  - Apollo ➡ FFM ➡ Post Job Review ➡ Report error in STAR
- **Roles clarified – RM, FF director, Investigator**
- **FF meeting separate from Corrective Action development**
- **Detailed HPI guidance**

# Looking Down the Road

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- **Full implementation of HPI-based FF and analysis across site**
- **Increased reporting of minor and non consequential errors will lead to more analyses**
- **Increased organizational learning**
- **Longer-term**
  - Decrease in significant events
  - Continued increase of trust in the work place
  - Increase in production quality, productivity

# H O P I

## UTILITIES & OPERATING SERVICES



2008/06/17

# The Severity Pyramid

