

Pragmatic Inclusion of Human Factors In Incident Investigation

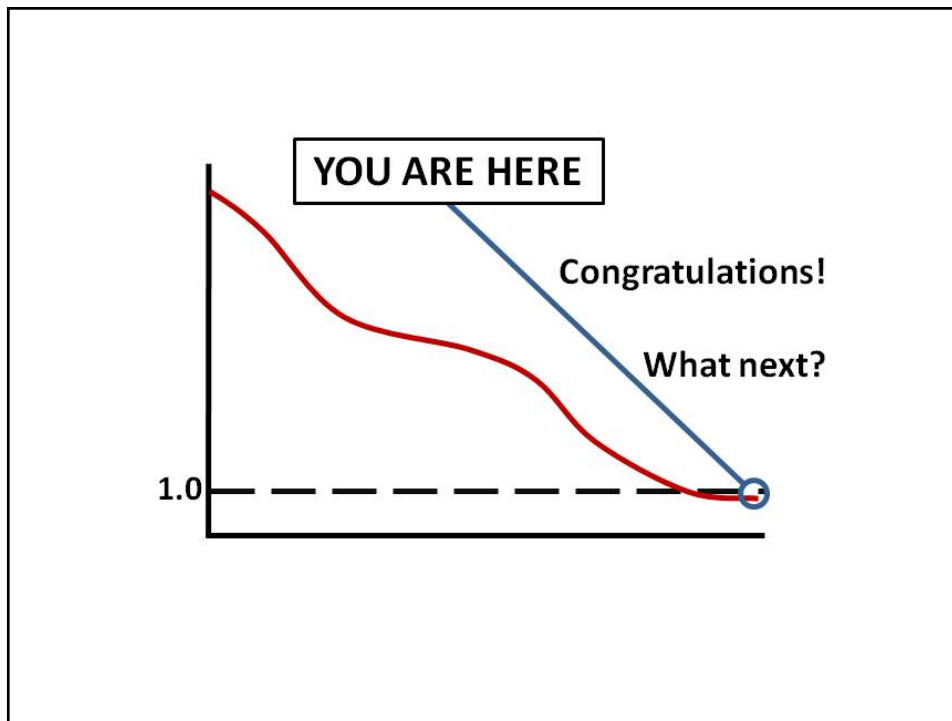


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Norman Ritchie has worked in oil and gas for over 30 years. Educated as a Mechanical Engineer at the University of Glasgow in Scotland, he has gained broad expertise through engineering and management positions in exploration, production and capital projects. Ritchie's experience covers the full hydrocarbon development life cycle from conceptual design to decommissioning.

Since 1997, Ritchie has consulted in project management and enterprise risk management. As a Director of vPSI group, LLC, which he co-founded in 2003, Ritchie provides consulting and training in performance measurement and improvement, principally in the areas of risk, loss prevention, safety, problem solving and human factors.

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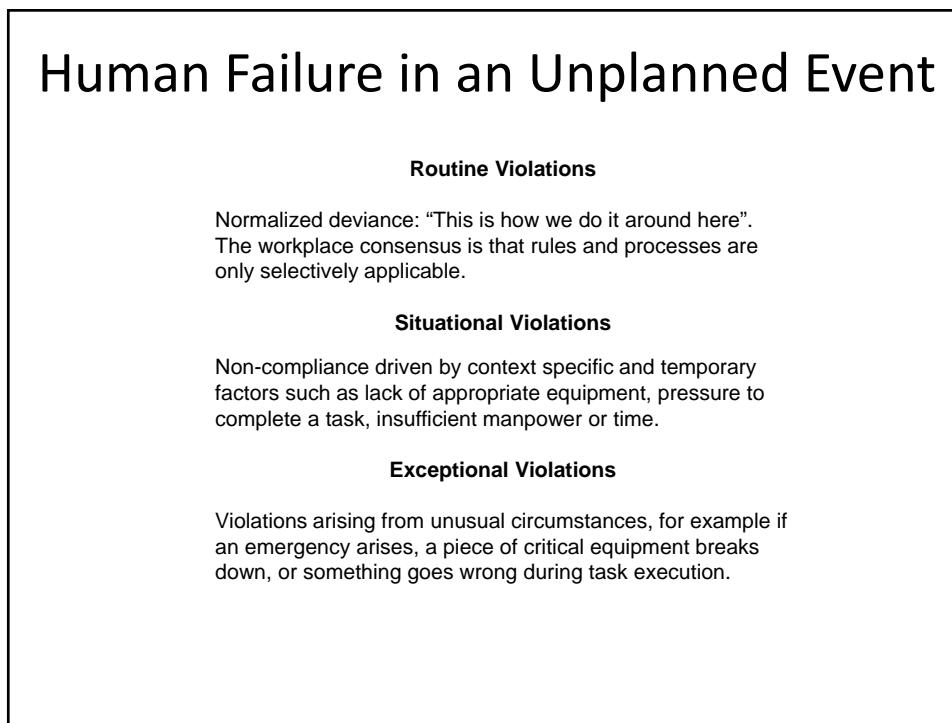
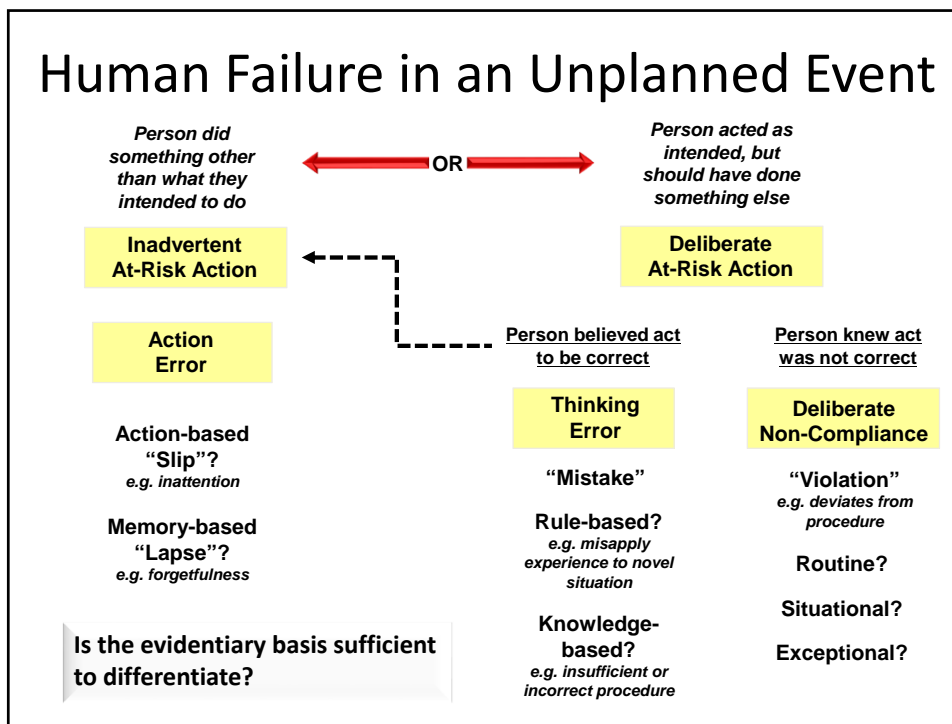
What Is / Are Human Factors?

OGP (From OGP 368)	UK HSE (From HSE Human Factors Briefing Note No. 1)	SPE (From SPE-170575-TR Human Factors Technical Report)
<p>CULTURE/WORKING ENVIRONMENT</p> <ul style="list-style-type: none"> Social and community values Communication flow within organization Acceptance and willingness to change Language, geography, climate Management support of safety <p>MANAGEMENT SYSTEMS</p> <ul style="list-style-type: none"> Compatible organizational goals Job safety analysis Quality of operating procedures/work practices Clear interfaces/responsibilities Risk management Safe working practices Work/task design issues Leadership <p>PEOPLE</p> <ul style="list-style-type: none"> Fatigue and stress Training systems Workload and shift schedule Behavioral safety Physical and mental fitness <p>FACILITIES / EQUIPMENT</p> <ul style="list-style-type: none"> Ergonomics Design Maintenance Reliability Physical layout of facilities and site Noise, lighting, toxics, radiation 	<p>How much is covered elsewhere e.g. in PSM, or in a different organizational function?</p> <p>Where to start?</p> <p>Common thread is Human Error / Failure</p> <p>API (From RP 75 Development of a Safety and Environmental Management Program for Offshore Operations and Facilities)</p> <p>The interaction and application of scientific knowledge about people, facilities and management systems to improve their interaction in the workplace and reduce the likelihood and/or consequences of human error.</p>	<p>Leadership and Culture</p> <ul style="list-style-type: none"> Perception of Risk and Decision-Making Communication of Risk <p>Human Factors in Design</p> <ul style="list-style-type: none"> Individual and Team Capacity Collaborative and Distributed Team Working Commercial and Contractual Environment Workload Transition Assurance of Safety-Critical Human Activities Investigation and Learning from Incidents <p>Center for Offshore Safety</p> <p>(Draft: Work in progress) Critical Barriers and Critical Operations that require human actions in order to be implemented effectively, anticipates organizational and situational challenges to effective human action/reaction in implementing them, and identifies preventative and mitigative strategies or tactics to minimize the risk or impact of human ineffectiveness throughout the life cycle of those barriers and operations.</p>

Challenges

- Large number of Unplanned Events
- Limited investigative resources
- Causal analysis often resource intensive
- High proportion of Unplanned Events have a Human Failure component
- Evidentiary basis often low fidelity
- Humans are complicated and unavoidable
- Certain types of Human Failure are not preventable
- Corrective Actions differ according to the Human Failure type involved

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Human Failure in an Unplanned Event

Evidentiary basis must be sufficient to differentiate between:

Slip

Lapse

Mistake

Violation

Evidentiary basis must also be sufficient to determine whether At-Risk Act are:

Enabled

Difficult

Non-Enabled

Human Failure in an Unplanned Event

Enabled

The choice between a Safe or At-Risk act or behavior is entirely within the person's control; there are no external drivers (except possibly group norms).

Difficult

Safe performance of the task has obstacles imposed upon it (e.g. time required to fetch equipment located remotely from the task site). Safe behavior is possible but the At-Risk act or behavior is easier. Before engaging in an At-Risk act or behavior, the worker may conduct a form of cost / benefit analysis, with cost being based on a risk assessment. Note that this process may be unconscious.

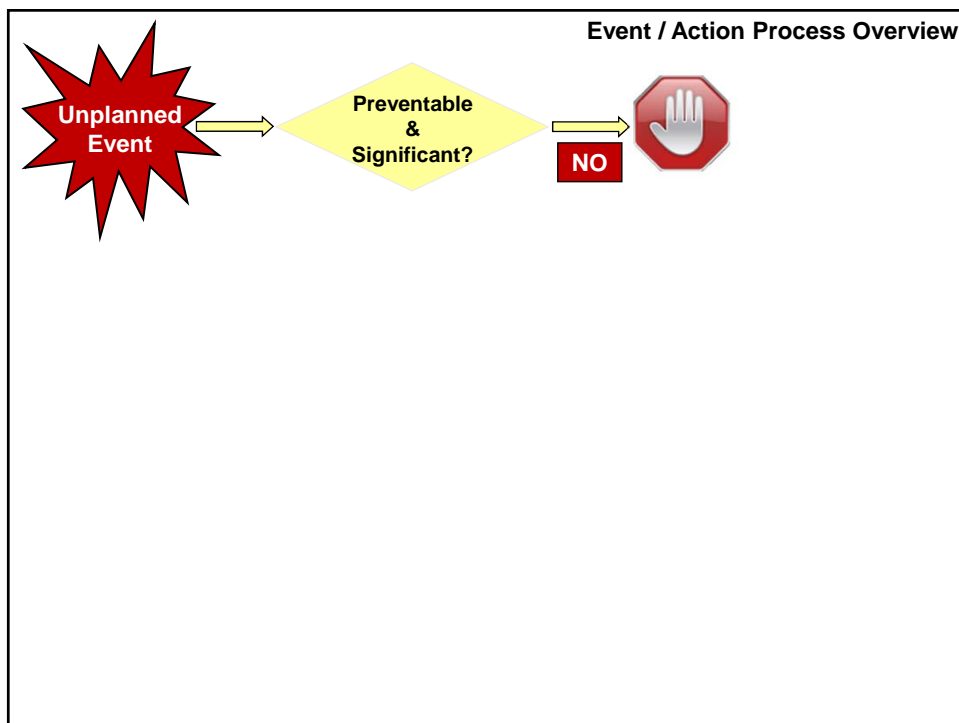
Non-Enabled

The worker is forced to engage in an At-Risk act or behavior; there is no other way to perform the task at hand. (e.g. equipment required to do the task safely is not available).

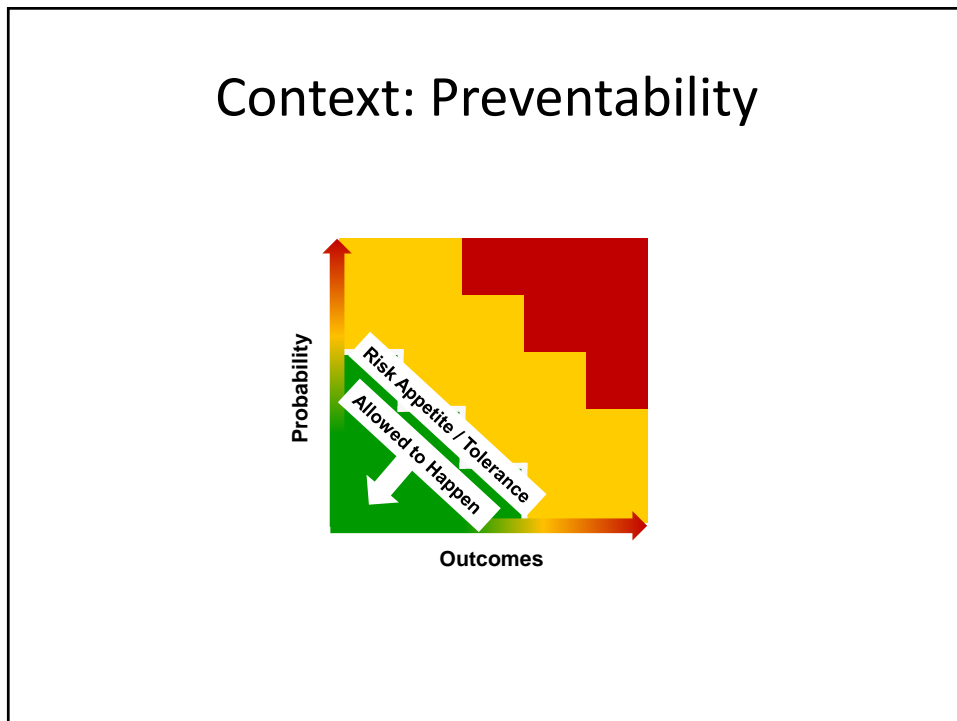
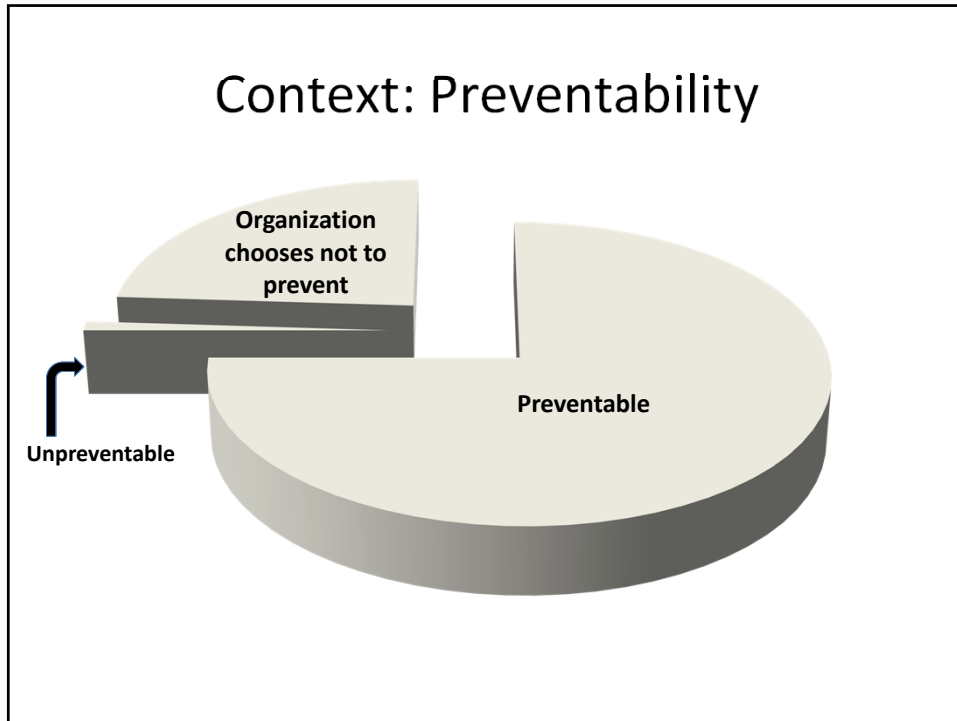
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Pragmatic Resource Investment

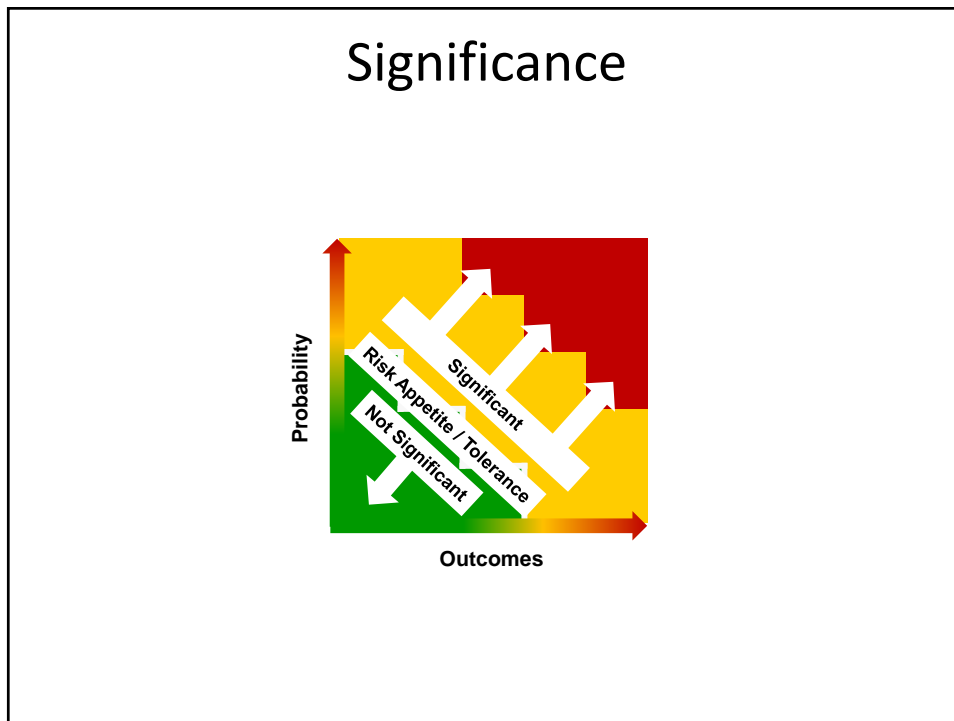
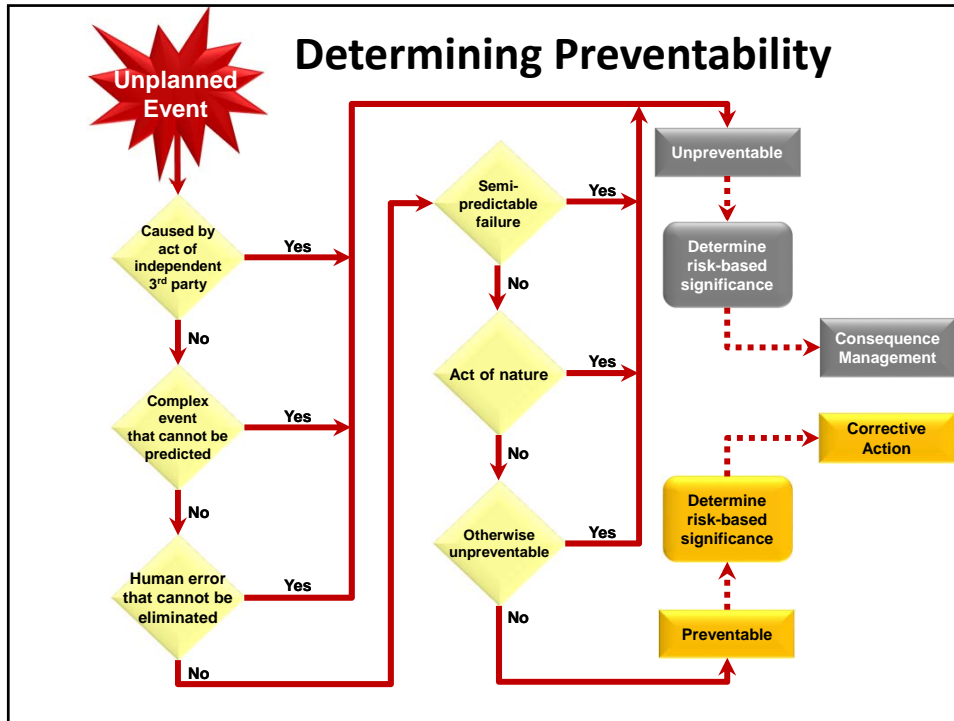
- Should all Human Failure related Unplanned Events be fully investigated?
- Which Human Failure related Unplanned Events are worth investing resources in to prevent reoccurrence?
- How do you decide?



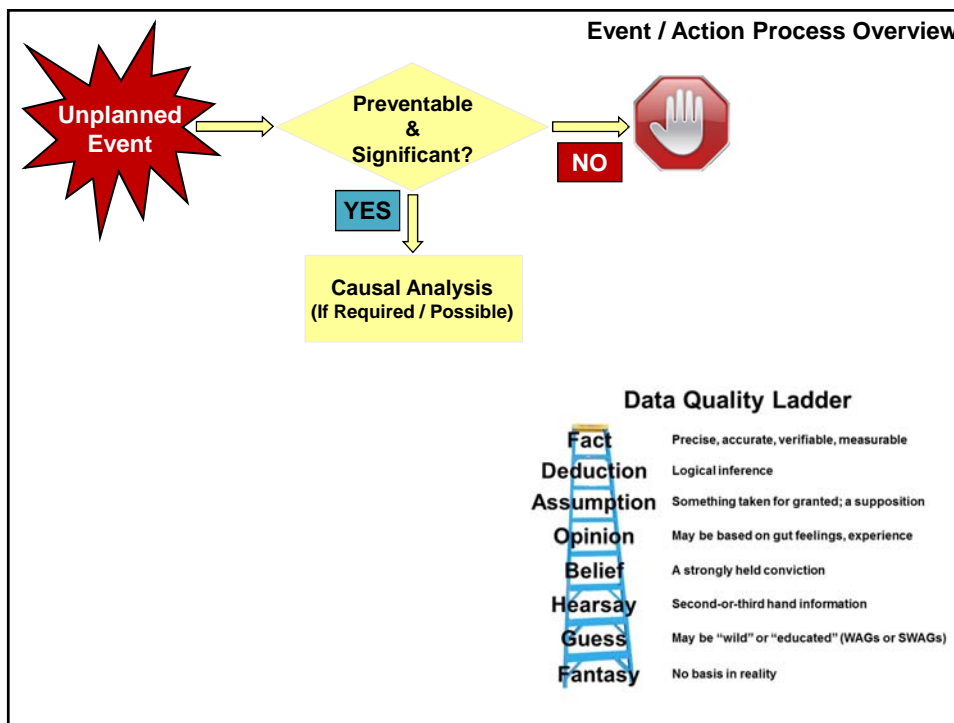
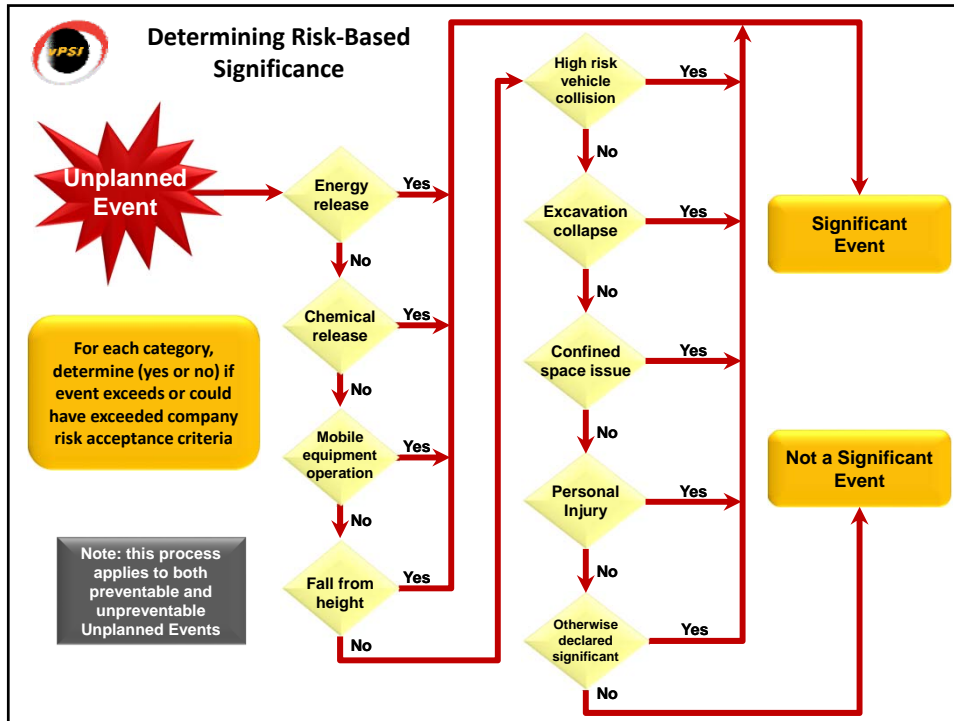
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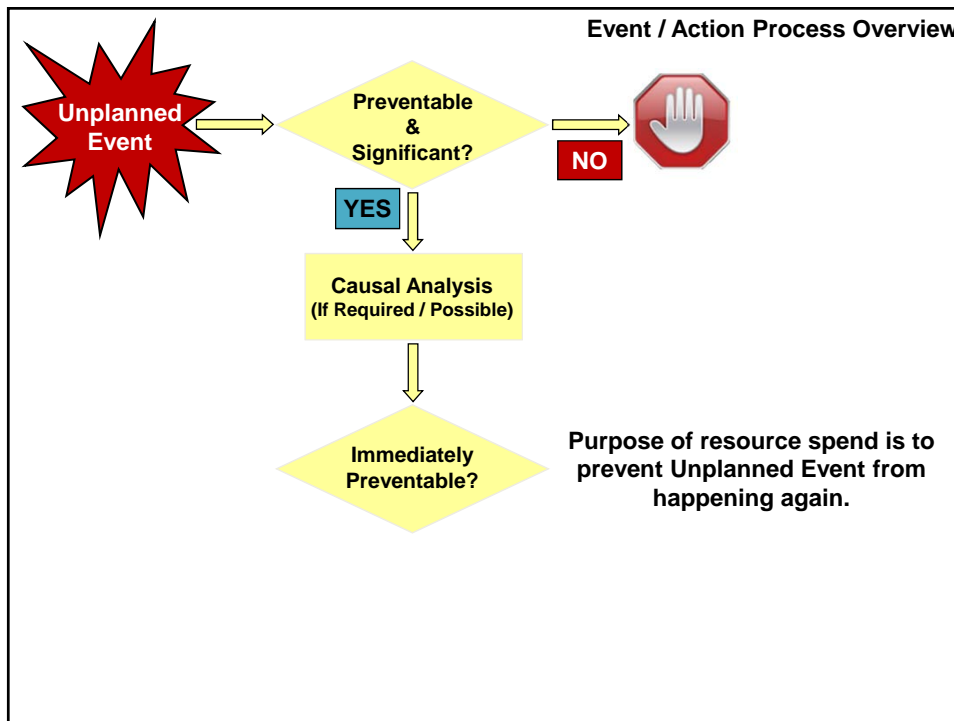
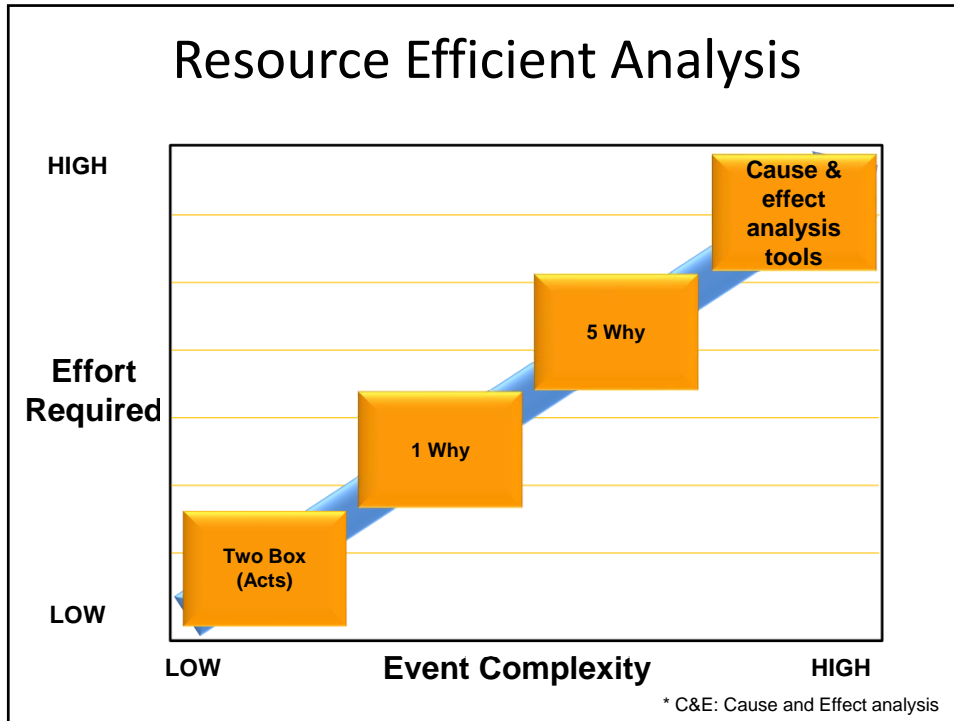
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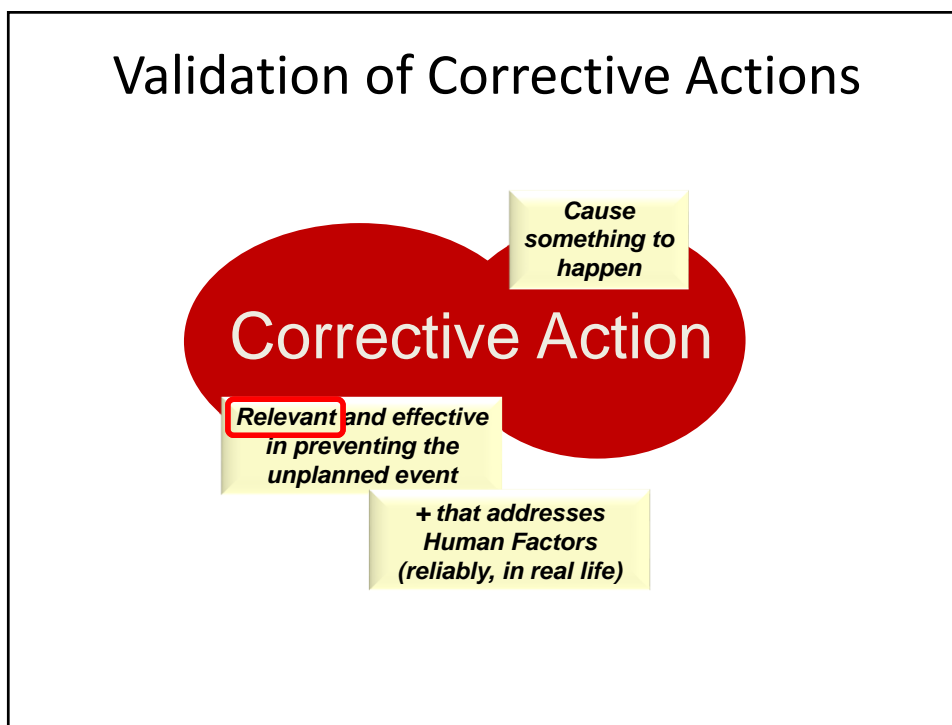
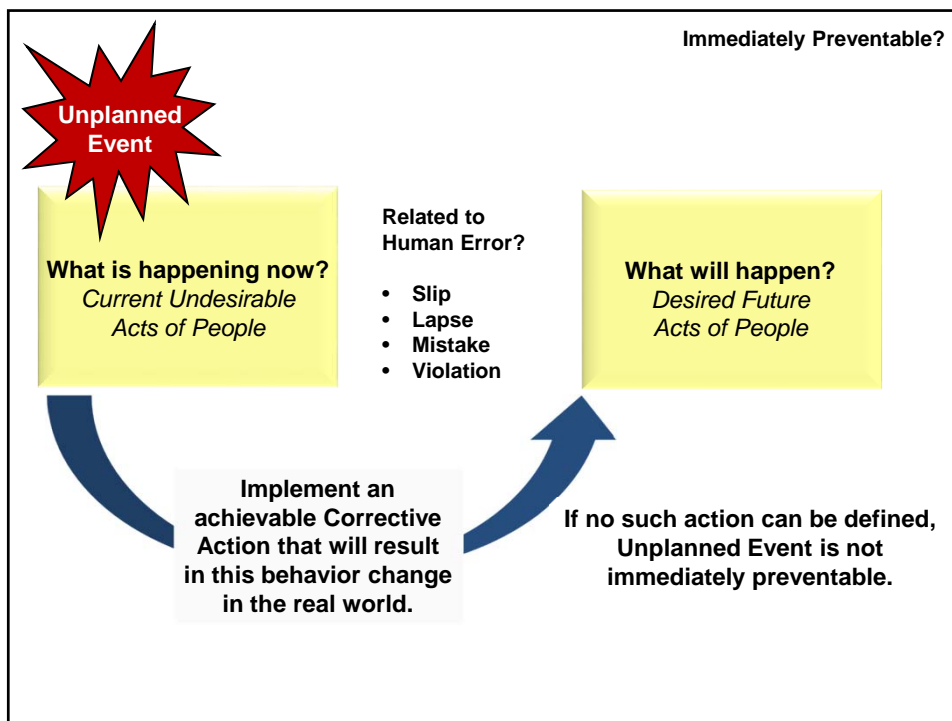
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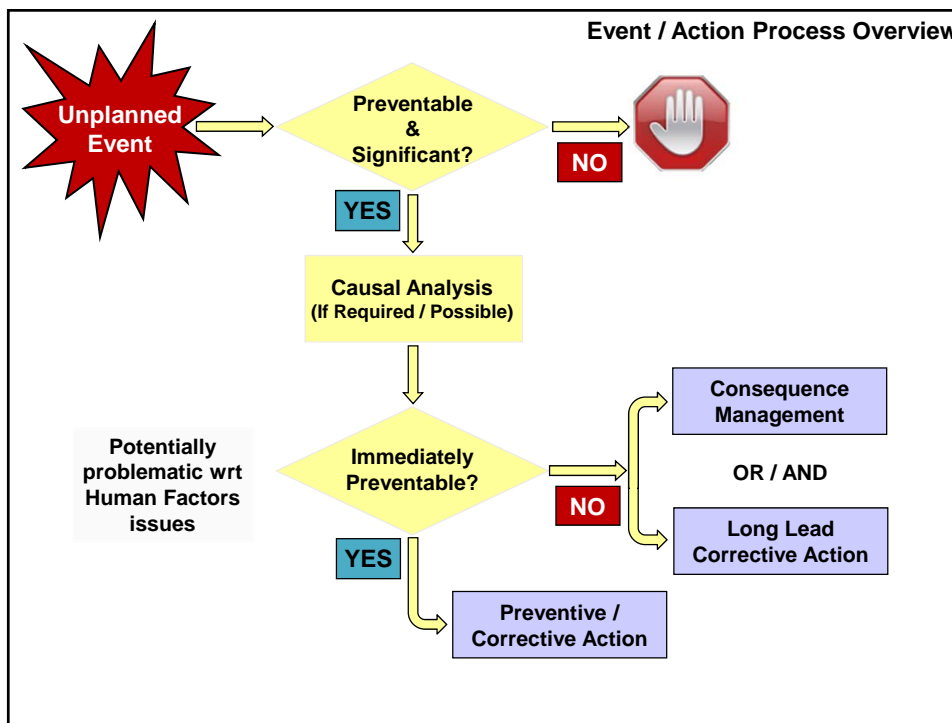


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Examples of HF Corrective Actions

Human Failure Type	Description	Example Corrective Actions
Slip	<i>Act other than intended, Action-based</i>	Difficult to eliminate the human failure completely. Reduce probability of error escalating via independent verification of critical items. Make work process error tolerant.
Lapse	<i>Act other than intended, Memory-based</i>	
Mistake	<i>Act as intended, should have done something else, Rule-based</i>	What if analysis generated scenario based training. Job / system specific competency training. Procedure revision. Improved system data delivery.
Mistake	<i>Act as intended, should have done something else, Knowledge-based</i>	
Violation (Routine)	<i>Act as intended, should have done something else, Deliberate Non-Compliance</i>	Depends on whether Violations are Enabled, Difficult or Non-Enabled.
Violation (Situational)		Engaged supervision increasing reward probability for desired behaviors and negative outcomes for Violations.
Violation (Exceptional)		Modify work environment to eliminate forcing conditions. Eliminate unnecessary rules and bureaucracy.

* Note these are only Corrective Actions when validated in context for a specific Unplanned Event



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Actions You Can Take

- **Gap / Opportunity Analysis of current processes from Human Factors perspective**
- **Implement significance and preventability filters**
- **Facilitate HAZOP-like Human Factors reviews**
- **Develop and train onsite Data / Evidence Gathering Protocol to allow incorporation of Human Factors in incident investigation process**
- **Train personnel in resource efficient and effective analysis of Human Factors issues**
- **Train personnel in development of efficient and effective corrective actions against Human Factors issues**
- **Measure the effectiveness of the organization's response to Unplanned Events, including those involving Human Factors**

* Note "Train" in this context means impart and maintain competence



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Questions?

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