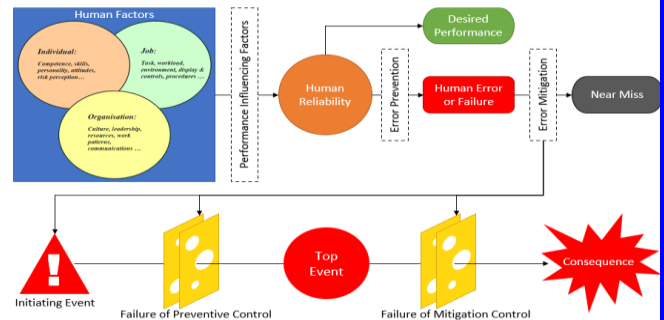


## Integrating Human Factors in Incident Investigations

### Why Human Factors in Incident Investigations Matter

Traditional Root Cause Analysis (RCA) often stops at “human error,” leading to corrective actions that are superficial and ineffective. In reality, human behaviour is influenced by system design, workload, procedures, training, and organizational culture. A structured Human Failure Analysis Framework helps uncover these deeper influences, ensuring that corrective measures address the true causes. This approach strengthens risk controls and reduces the likelihood of incident recurrence.

#### Model of Human Factors Contributions to incidents:

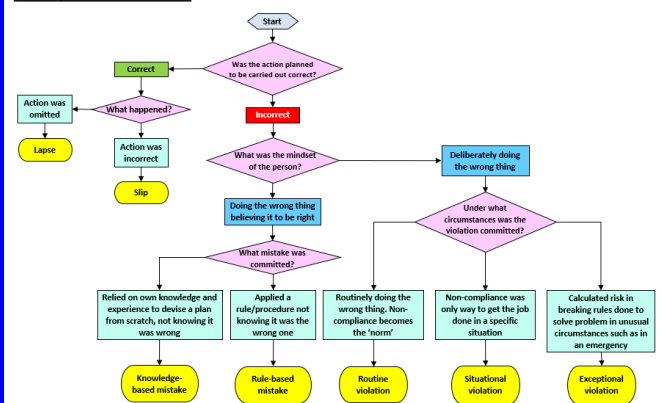


### Investigation Workflow?

A structured five-step method is recommended:

1. **Classify the human failure** (slip, lapse, mistake, or violation)
2. **Identify performance influencing factors (PIFs)** such as unclear instructions, divided attention, poor procedures, or weak safety culture
3. **Conduct bow-tie analysis** to evaluate whether adequate barriers are in place to prevent human error
4. **Develop corrective actions** (engineering, procedural, cultural, or organizational)
5. **Implement and verify effectiveness** (through audits, inspections, MOC, and feedback)

#### Classify the human failure

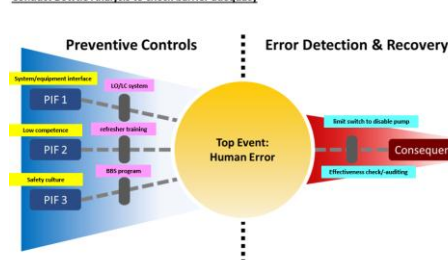


#### Identify Performance Influencing Factors (PIFs)

Job Factors	Individual Factors	Organisation Factors
Clarity of signals, instructions and other information System / equipment interface (labelling, alarms, failure evidence/ tolerance)	Physical capabilities / limitation	Work pressures e.g. production vs. safety, poor work planning
Difficulty / complexity of task	Stress / morale	Level and nature of supervision / leadership
Non-routine or unusual task	Work overload / underload	Communication system, e.g. one way communication
Divided attention, e.g. constant disturbances and interruptions	Low competence / skill levels	Staffing / manning levels
Procedures inadequate or inappropriate	Low motivation (bored or disheartened staff)	Clarity of roles and responsibilities
Preparation for task	Physical health (disease, medication, fatigue, substance abuse, etc.)	Consequence of failure to follow rules / procedures
Time available / required	Mental health	Effectiveness of organizational learning (learning from experience)
Tools inappropriate for task or equipment poorly maintained		Organizational or safety culture e.g. everyone breaks the rules
Communication / relationship with colleagues, supervisor, contractor, other		Policy and leadership commitment
Physical environment (noise, vibration, heat, space, lighting, ventilation, humidity)		Resource availability
		Competency management and assurance, e.g. 'on-the-job' training is unstructured

Ref:  
<https://www.hse.gov.uk/humanfactors/assets/docs/pifs.pdf>

#### Conduct Bowtie Analysis to check barrier adequacy



#### Develop corrective Actions

##### Mapping of effective risk control against type of human failure

Safety Measures	Slips	Lapses	Mistakes	Violations
Control/display design	✓	✓	✓	✓
Equipment/tool design	✓			✓
Memory aids		✓		
Training			✓	
Work Design	✓	✓	✓	✓
Procedures	*	✓	✓	✓
Supervision	*	*	✓	✓
Reducing distractions	✓	✓	✓	✓
Environment	✓	✓	✓	✓
Communications	*	*	✓	✓
Decision aids			✓	✓
Behavioral Safety			✓	✓

✓ Strong improvement  
\* Possible improvement

Ref:  
<https://www.energyinst.org/7a-697917&utm=see%20p.32>

### Key Takeaways

- Human error should not be the “end point” in investigations.
- Determine **why** an error occurred by analyzing job, individual, and organizational factors.
- Strengthen barriers using the **hierarchy of controls**—automation, interlocks, improved procedures, supervision, and culture.
- Verify changes through structured follow-up to ensure long-term effectiveness.

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