Building Situation Awareness in Operators

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How Do We Improve SA?

Organizational System

Safety Culture

Technical System

SA Oriented Design

Social System

SA Oriented Training
The Development of Expertise at SA

10 Fold Difference in SA among Experienced Personnel

SA is demanding, frequently incomplete and erroneous

Novice

- Limited attention
- Limited working memory

SA is fast, can be effortless, more complete, greater comprehension & projection

Expert

- Schema of prototypical situations
- Mental models of domain
- Automaticity of processes
- Learned skills (e.g. scan patterns, communications)

Abilities
- Spatial
- Attention
- Memory
- Perceptual
- Cognitive

Knowledge
- Mental models
  - Schema
  - Critical cues
- Goals
- Preconceptions and objectives

Skills
- Information management
- Communication
- System operations
- Scan patterns
- Planning

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What Allows People to Achieve High Levels of SA?

Schema
- Prototypical & Expected
  - Objects
  - Scenes
  - Order of Events

Mental Model

What information is attended to
How information is interpreted and integrated
What projections are made

Critical Cues

External Cues

Perception → Comprehension → Projection

Situation Model (SA)
Training about SA

- What is SA?
- SA Errors
- SA Demons
- How to Avoid Problems
- Improving SA in Team

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Training Situation Awareness
Knowledge, Skills, & Behaviors

Virtual Environment Situation Awareness Rating System (VESARS)

Interactive Situation Awareness Trainer (ISAT)

SA Feedback
Mental Models & Schema Training
Basic Skills
Meta-Cognitive Skills

SA Trainer

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