Building Situation Awareness in Operators
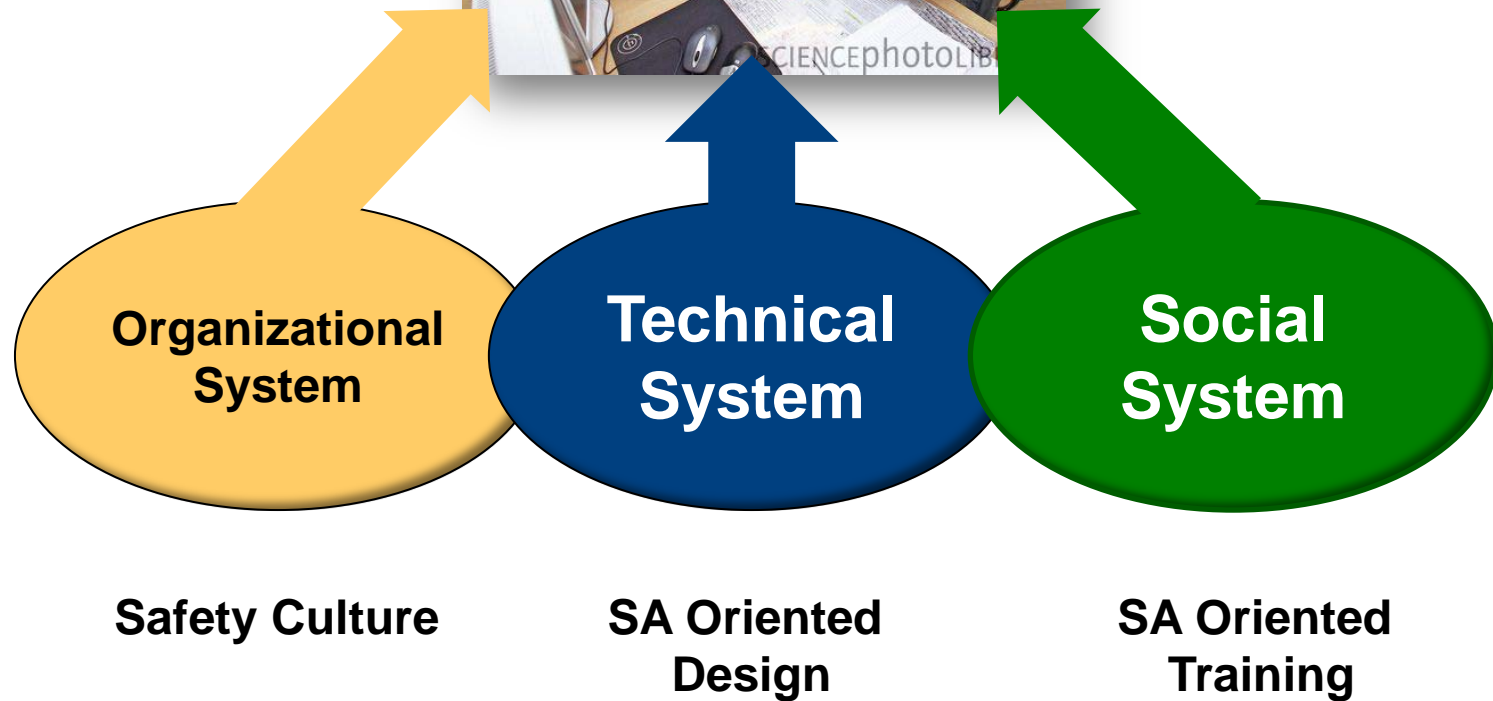
Mica Endsley, PhD
SA Technologies

2001 Woman Owned Business Of the Year -NASA-

www.____es.com

How Do We Improve SA?

Organizational System

Technical System

Social System

Safety Culture

SA Oriented Design

SA Oriented Training

Know the Situation. Know the Solution.

The Development of Expertise at SA

10 Fold Difference in SA among Experienced Personnel

SA is demanding, frequently incomplete and erroneous

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

Novice ⟵ ⟶ Expert

• Limited attention
• Limited working memory

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

<u>Abilities</u>
- Spatial
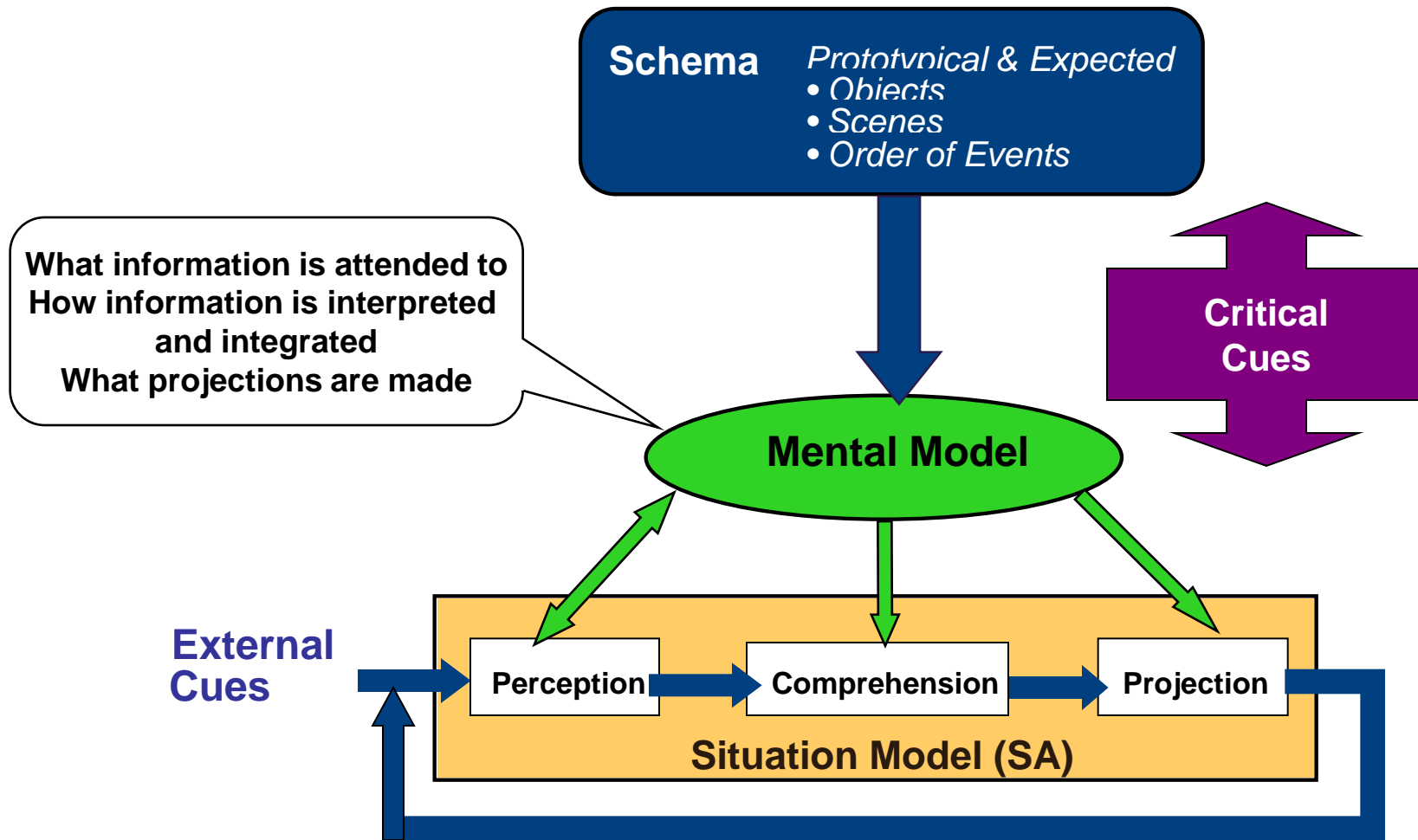- Attention
- Memory
- Perceptual
- Cognitive

<u>Knowledge</u>
- Mental models
  - Schema
  - Critical cues
- Goals
- Preconceptions and objectives

<u>Skills</u>
- Information management
- Communication
- System operations
- Scan patterns
- Planning

Know the Situation. Know the Solution.

What Allows People to Achieve High Levels of SA?

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

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

Critical Cues

Mental Model

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**

Get SA Look, Think, Anticipate

Training Situation Awareness Knowledge, Skills, & Behaviors

SA Technologies

Virtual Environment Situation Awareness Rating System (VESARS)

Interactive Situation Awareness Trainer (ISAT)

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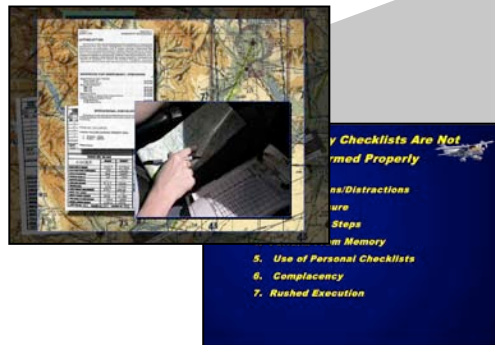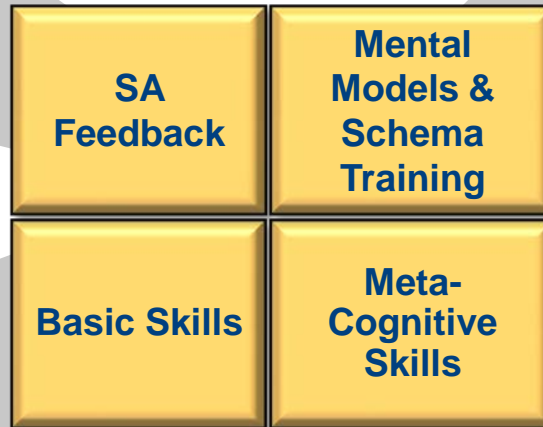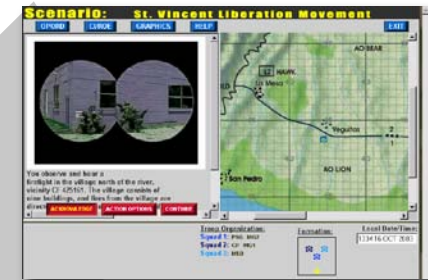
SA Trainer

Situation Awareness Virtual Instructor (SAVI)

Know the Situation. Know the Solution.