International Civil Aviation Organization

2014 LOCI Symposium
ICAO Dealing with Unexpected Events (DUE) Working Group

Human Cognitive Performance

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DUE Group Members

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DUE Group Focus

To describe the physiological, psychological (cognitive), and performance impacts on the flight crew following Unexpected Threatening Events (UTEs) in flight
Definitions

*Unexpected Threatening Event*: Any in-flight event that the flight crew could not anticipate in the course of normal flight operations and that is perceived as having a high negative impact on the safety of the current flight.
Definitions

*Startle Response:* The initial short-term, involuntary physiological and cognitive reactions that commence the normal human stress response.
Definitions

**Stress Response:** A response to an unexpected event that includes physiological, psychological, and cognitive effects that may range from positive to negative and may enhance or degrade performance.
Definitions

**Surprise:** An emotion typically resulting from the violation of an expectation (a difference between expectation and reality).
Response to an UTE

Stimulus

Perception

Response

- Sensory perception
- Emotional significance
- No emotional significance

- Physiological response
- Cognitive processing
- Cognitive focus and clear thinking
- Cognitive tunneling, decreased working memory capacity, non-constructive processing

- False alarm
- Threat

Initial
Prolonged
Research Purpose

• To develop a *detailed understanding* of professional PICs’ experiences of an *extended, extreme* in-flight emergency, which were successfully overcome, focused on the cognitive processes employed.
Research Focus

- Cognitive processes in general, and aeronautical decision making specifically, to include risk assessment and problem solving.
ADM

- Codified Strategy (Rule-based)
- Associative Strategy
- Analytic Strategy
Thank You

Questions?