A Human-Systems Approach to Proactively Managing Risk through Training in an Evolving Aviation Industry

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NextGen will introduce new procedures & operational conditions

Changes Impact Performance

- New human-system and human-human interactions
- New off-nominal conditions
- Gaps in existing checklists & SOPs
- Gaps in existing training programs
Human Organizational Safety Technique

- Human-centered method for proactively bridging the gap between current & future operations

- Identifies task impacts, sources of resiliency, emerging risks, and performance metrics

- Data-driven outputs that are repeatable and scalable to evolve training platforms
HOST Approach

1. Review Change vs Current Operations
2. Identify Actors, Tasks, KSAs, & Systems
3. Strategic Impact Analysis
4. Human-System Interaction Models
5. Key Interaction Analysis
6. Assess, Quantify, Prioritize Impacts
7. Develop Mitigation/Implementation Strategies
8. Implement Mitigations Into Training Platform
Interval Management

PBN Route

Assigned Spacing Objective: 6 NM

Current Operations

- ATC utilizes speed instructions & vectors to maintain spacing
- Vectoring and speed instructions may create system inefficiencies
- Flight crews may not be aware of controllers purpose or plan

Future Operations

- ATC assigns eligible aircraft pairs an interval management clearance
- Trailing flight crew will maintain an assigned interval behind lead aircraft
- Capability utilizes ADS-B in/out capabilities & advanced avionics

Source: Pilot and Air Traffic Controller use of Interval Management during Terminal Metering Operations. MITRE – January 2018
Interval Management

En Route Controller

Input IM Pair
Monitor Conformance

Traffic & Aircraft Info
Aircraft Pair

IM Clearance – Interval, Target, Termination Point

IM Clearance Acknowledgement

Flight Crew

Check clearance viability
IM Interval & Target AC
Monitor Interval Conformance
Terminate Interval Pair

Other Aircraft Traffic
Current Interval Status

En Route Automation

Flight Crew Automation

Assigned Spacing Objective: 6 NM
Interval Management

En Route Controller

ID Pairing Opportunity

IM Clearance – Interval, Target, Termination Point

IM Clearance Acknowledgement / Readback

En Route Automation

Flight Crew

Check clearance viability

IM Interval & Target AC

Monitor Interval Conformance

Terminate Interval Pair

Flight Crew Automation

Assigned Spacing Objective: 5 NM
Interval Management

- En Route Controller
- Flight Crew

IM Clearance – Interval, Target, Termination Point

- Task-specific KSA impacts
- Sources of human-system resiliency
- Emerging risks
- Post-implementation performance measures

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Key Takeaways

- HOST identifies key intersection points between task impacts, risks, and training opportunities
- HOST may be used to revalidate and/or evolve an existing training platform
- Guides the use of safety performance indicators & post-implementation alerting thresholds
Fort Hill Group provides strategic guidance, analysis, and training to empower organizations to improve human performance and reduce operational risks.

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