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

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

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Embry-Riddle Aeronautical University
August 14, 2018

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

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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

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HOST Approach

Baseline

1. Review Change vs Current Operations
2. Identify Actors, Tasks, KSAs, & Systems
3. Strategic Impact Analysis

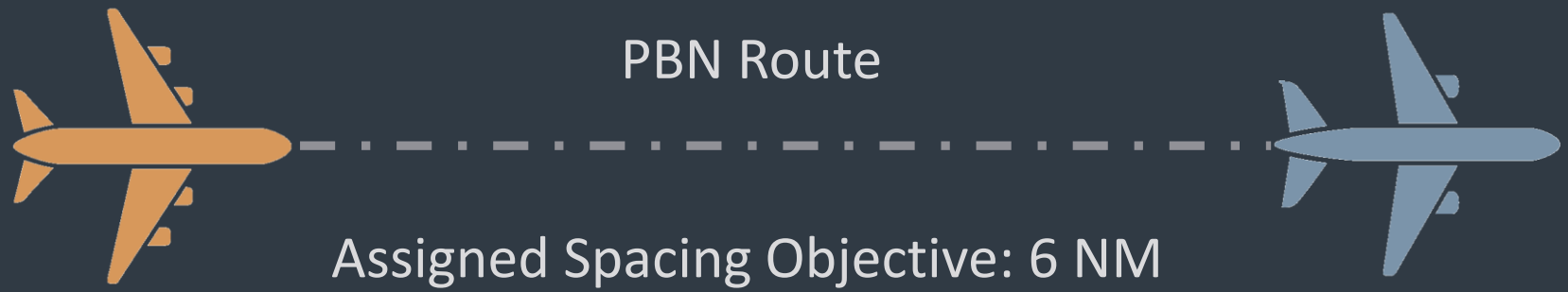
Model

4. Human-System Interaction Models
5. Key Interaction Analysis
6. Assess, Quantify, Prioritize Impacts

Implement

7. Develop Mitigation/Implementation Strategies
8. Implement Mitigations Into Training Platform

Interval Management



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

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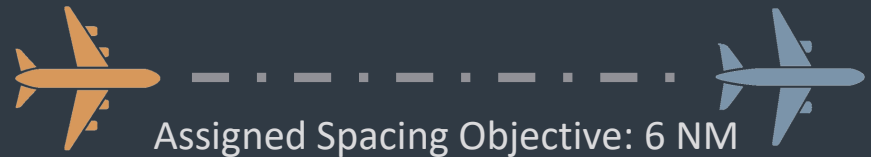
Source: Pilot and Air Traffic Controller use of Interval Management during Terminal Metering Operations. MITRE – January 2018

Interval Management

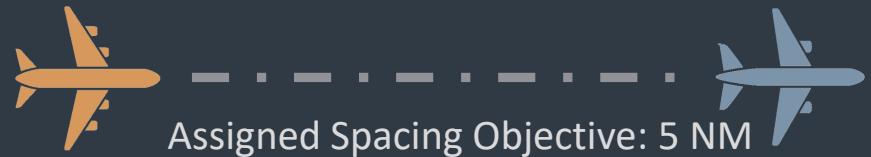


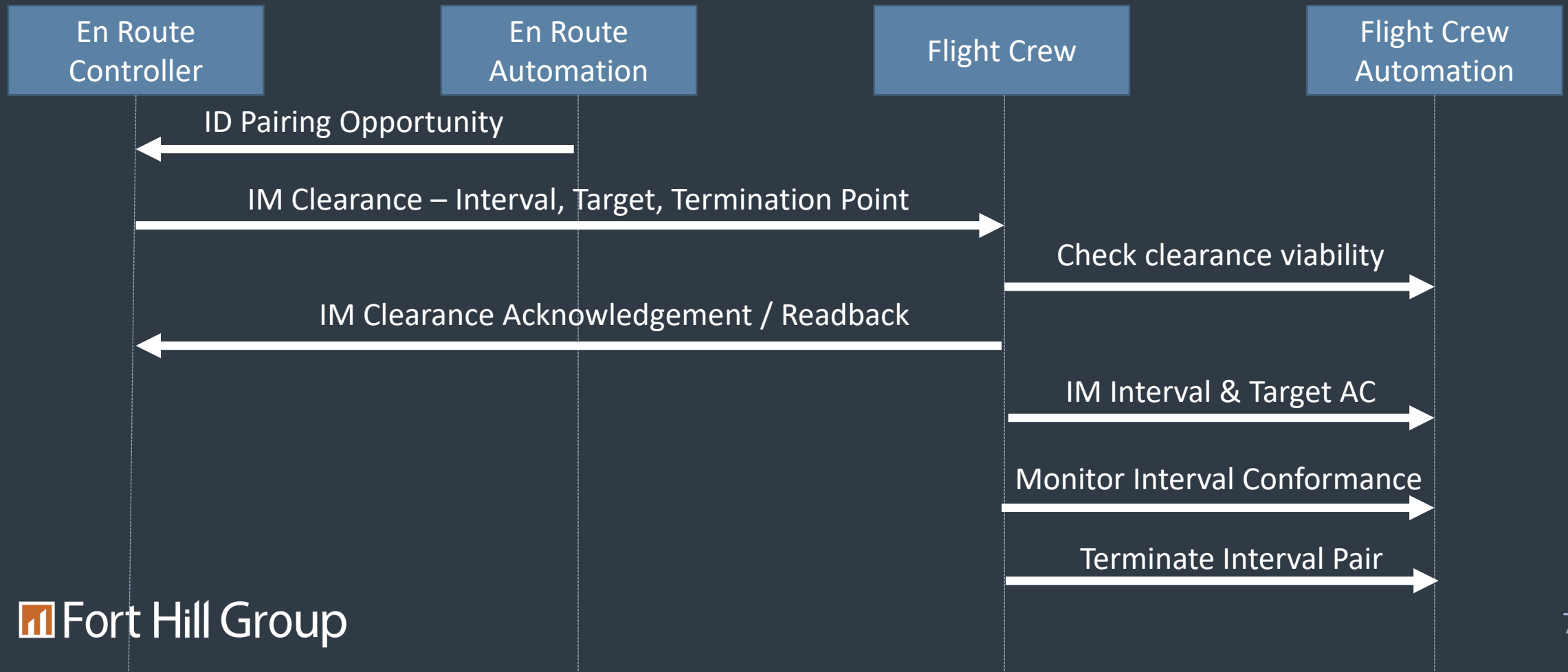
IM Clearance – Interval, Target, Termination Point

IM Clearance Acknowledgement

En Route Controller		Flight Crew
Input IM Pair Monitor Conformance	Traffic & Aircraft Info Aircraft Pair	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

Interval Management





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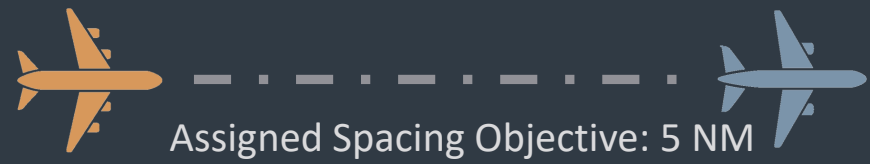
Interval Management



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

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

THANK YOU

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Fort Hill Group provides strategic guidance, analysis, and training to empower organizations to improve human performance and reduce operational risks.

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