Subject Matter Expert Evaluation of Multi-Flight Common Route Advisories

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Outline

• Background on Multi-Flight Common Routes (MFCR)

• Subject Matter Expert evaluation of MFCR

• Key results

• Conclusions
Multi-Flight Common Routes (MFCR) identifies opportunities for delay recovery by refreshing outdated routes
Example MFCR Advisory

MFCR advisory has 9 flights with a total of 53 minutes time savings
MFCR Features

- MFCR merges multiple flights to a common route, creating a new flow for increased operational acceptability

- Each route segment is clear of weather

- Each flight has time savings of at least 3 minutes

- Total flight time savings for group is at least 10 minutes

- MFCR provides graphical functionality for review and modification prior to implementation of advisory
Overview of Evaluation

• Laboratory evaluation, conducted 1 – 4 Nov 2016

• Five subject matter experts (SMEs) evaluated scenarios in Fort Worth Center (ZFW) & Houston Center (ZHU) airspace
  – SMEs were recently retired traffic managers
  – Each SME evaluated 40 scenarios
  – Each scenario featured a static MFCR advisory

• Obtained SME feedback on:
  – Operational acceptability of MFCR re-route advisories
  – Workload and situational awareness
  – User interface
  – Viability of overall MFCR concept of operations
Houston Center advisories generally featured more flights than Fort Worth Center advisories.
Acceptability Ratings

Fort Worth Center
- 55% of Initial Advisory ratings were acceptable
- 86% of Final Advisory ratings were acceptable

Houston Center
- 22% of Initial Advisory ratings were acceptable
- 75% of Final Advisory ratings were acceptable
Comments on Acceptability

• Most advisories that were initially rated as low acceptability were rated as high acceptability after SME modification.

• Modifications often corrected undesirable sector traversal:
  – Route runs close to sector (or Center) boundary
  – Route cuts across corner of sector(s)
  – Route crosses arrival/departure flows
  – Route crosses congested sector(s)
  – Route does not conform with standard flow patterns

• User interface provides functionality to quickly/easily make route modifications with feedback on performance measures.
Workload Ratings

Fort Worth Center

80% of Advisory ratings were for low workload

Houston Center

56% of Advisory ratings were for low workload

Workload Rating on Likert Scale

Percent of Ratings

Percent of Ratings

Workload Rating on Likert Scale
Situational Awareness Ratings

94% of Advisory ratings were for high situational awareness

64% of Advisory ratings were for high situational awareness
Conclusions

- MFCR received favorable evaluation from SMEs
- Good acceptability of final/modified MFCR advisories: 86% for ZFW and 75% for ZHU
- Low workload to evaluate and modify MFCR advisories: 80% for ZFW and 56% for ZHU
- MFCR user interface provides good situational awareness: 94% for ZFW and 64% for ZHU
- MFCR is a good example of human-automation teaming
Questions?

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