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Multi-Flight Common Routes (MFCR) identifies opportunities for delay recovery by refreshing outdated routes.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

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**Workload Rating on Likert Scale**

- **Percent of Ratings**
  - 0
  - 5
  - 10
  - 15
  - 20
  - 25
  - 30
  - 35
  - 40
  - 45
  - 50

- **Workload Rating on Likert Scale**
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
Situational Awareness Ratings

- **Fort Worth Center**
  - 94% of Advisory ratings were for high situational awareness

- **Houston Center**
  - 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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