Initial Integrated Collaborative Rerouting (ICR) Evaluation Report

September 2006

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Abstract

This paper documents human-in-the-loop (HITL) evaluations conducted during fiscal year 2006 to define, validate, and refine the Initial Integrated Collaborative Rerouting (ICR) concept and requirements. ICR is an enhanced, more collaborative version of rerouting that involves customers early in the process and allows them to submit preferences for reroutes. The ICR concept is based upon reroute modeling, generating route options from a pre-coordinated database, and collaboration between Federal Aviation Administration (FAA) traffic management and customers. The evaluations focused on each step within the concept using prototypes developed by The MITRE Corporation's Center for Advanced Aviation System Development (CAASD) and Metron Aviation, Inc. to give the look and feel of a seamlessly integrated system. Evaluation participants included FAA traffic managers, commercial carriers (aircraft dispatchers, air traffic coordinators), and general aviation (flight followers). Participant feedback and data collected during the HITL evaluations have been captured in this document.

KEYWORDS: ICR, Integrated Collaborative Rerouting, rerouting, reroute modeling, collaboration, traffic manager, customer, TMU, dispatcher, flight following, commercial aviation, general aviation, ATCSCC, Air Traffic Control System Command Center, Traffic Management Unit, Route Options Generation, ROG, Early Intent, Future Traffic Display, Planning Advisory, Reroute Monitor

Acknowledgments

The authors would like to thank the members of the Collaborative Decision Making Future Concepts of Flow Management Sub-Team and the many operational personnel who attended the Initial ICR exercises and group discussions summarized in this document. Special thanks to Mike Golibersuch of Volpe National Transportation Systems Center and Ted Cochrane of MITRE/CAASD for assistance with ETMS/CCSD setup and configuration for these exercises. Thanks also to the many MITRE/CAASD and Metron Aviation staff that helped prepare for and conduct the exercises and discussions.

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1 Introduction

The Integrated Collaborative Rerouting (ICR) Concept was developed under the auspices of a Collaborative Decision Making (CDM) working group. That working group, the Future Concepts of Flow Management Sub-Team[1] (known as the FCT), includes members from the Federal Aviation Administration (FAA), air carriers, and business aviation, as well as private industry, academia, and aviation research organizations.

One of the tools currently available for traffic flow management (TFM) in the National Airspace System (NAS) is defining and issuing reroutes to avoid potential weather and en route congestion problems. Today's reroute process is manually intensive and usually involves a one size fits all approach that is prescribed by the FAA without significant input from NAS users. ICR is an enhanced, more collaborative version of rerouting that involves customers early in the process and allows them to submit preferences for reroutes. FAA traffic managers (local and national) coordinate to define the constraint and provide more information to customers (in the form of Planning Advisories and route guidance) than is available today. Customers know their business needs and aircraft capabilities/limitations. Through the ICR process, they have the opportunity and additional automation to find reroute options for flights that avoid the constraint. The premise is that customer-submitted preferences will be accepted unless the traffic managers determine they are operationally infeasible. The FAA then deals with non-participating flights that have not rerouted themselves around the constraint. Important modeling capabilities are also provided, allowing traffic managers and customers to see the impact of proposed reroutes and create better reroute plans. Enhanced monitoring capabilities allow better implementation of the plan.

1.1 ICR Phased Implementation

The FCT first developed the Full ICR concept through a series of storyboard and Human-in-the-Loop (HITL) exercises conducted in fiscal year 2005 (FY05). Full ICR is described in its operational concept [1], functional requirements [2], and concept evaluation report [3]. In order to reduce schedule and implementation risks, the team defined an incremental evolution path that included a phased implementation plan. The FCT defined four phases of ICR that provide increasing levels of automation support, as listed in Table 1-1.

Table 1-1. Assignment of Automation Capabilities to ICR Concept Phases

[1] Until early 2005, this CDM working group was called the Integrated Concepts for the Evolution of Flow Management (ICE-FM) working group.

Phase	Automation Capabilities
Initial ICR	Initial Route Options Generation (ROG) capabilities in Route Management Tool (RMT) Reroute Monitor used to review customer preferences Some minor Enhanced Traffic Management System (ETMS) display and "modeling" enhancements Customer preferences via Early Intent (EI)
Phase 1	Future Traffic Display (FTD) with current routes only Additional ROG enhancements Additional ETMS Enhancements
Phase 2	"Basic" Reroute Modeling FTD with modeling of planned reroutes
Full ICR	Customer preference via Constraint Resolution Intent (CRI) Full Reroute Modeling including Flow Constrained Areas (FCAs) with modeled traffic

Other FCT documents cover the Initial ICR operational concept [4], functional requirements [5], and FTD with current traffic [6]. The materials discussed at the Full ICR and Initial ICR evaluations are available on the FCT page on the CDM website: http://cdm.metronaviation.com/Workgroups/ice-fm.html.

The FCT refined and validated the feasibility of the Initial ICR Concept through three evaluations in fiscal year 2006 (FY06). These evaluations are the focus of this document and are described in more detail in Sections 2 and 3. A joint Sub-Team consisting of members from the FCT and the Flow Evaluation Sub-Team (FET) was formed in May 2006 by the CDM Steering Group to oversee the implementation of the Initial ICR Concept.

1.2 Initial ICR Concept Overview

The Initial ICR Concept builds on the existing procedures developed for several ETMS capabilities: Flow Evaluation Areas (FEAs) and FCAs, the EI message, the Create Reroute capability, and the Reroute Monitor. Because this is the first step toward the Full ICR Concept, most of the changes are procedural, using these existing tools with some minor enhancements.

The major additional automation capability in Initial ICR is ROG. ROG is an automation capability that identifies predefined reroute options for flights that avoid an FEA or FCA. The predefined routes include Playbook plays, Coded Departure Routes (CDRs), Air Traffic Control (ATC) Preferred Routes, and ad hoc routes saved by the tool user. Various statistics, as well as filtering and graphical capabilities, are provided to help users select reroutes for flights. ROG also provides decision support to traffic managers for developing route

guidance and planning reroutes. The ROG capabilities were developed by Metron Aviation, Inc. For Initial ICR, the ROG capabilities are being implemented in RMT.

At a high level, the Initial ICR Concept can be visualized as having five stages (see Figure 1-1). Each stage is described in detail in the operational concept document [4].

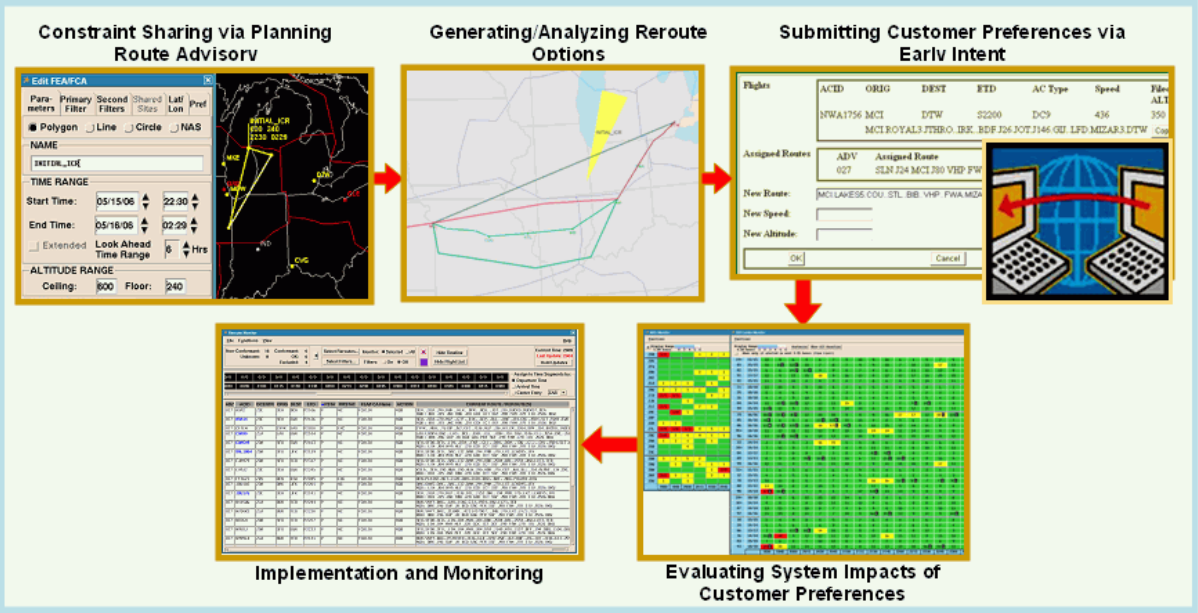

Figure 1-1. Initial ICR Concept Overview

2 Initial ICR Evaluation Environment

This section provides an overview of the participants, lab environment, and processes used in the three evaluations conducted by the FCT in FY06 exploring the initial phases of the ICR Concept.

Table 2-1. Initial ICR Evaluations

Date	Location	Activity	Results
Dec 1-2, 2005	MITRE	Initial/Phase 1 ICR HITL	Connected prototype tools to live ETMS Test String; FTD used in this evaluation
Jan 17-19, 2006	MITRE	Initial ICR HITL	Determined Initial ICR ready for implementation
May 9-10, 2006	MITRE	FCT/FET Transition Exercise	Handed-off Initial ICR to FCT/FET Implementation Team

Each evaluation included a concept overview session to refresh returning participants and to educate new participants. The concept walk-throughs were followed by familiarization/training sessions for the prototype tools to be used in the evaluation. The emphasis was on new capabilities developed since the previous evaluation. The evaluation sessions themselves were followed by a debriefing session in a nearby conference room.

2.1 Evaluation Participants

Participants at the Initial ICR evaluations included representatives from a variety of operational perspectives. National traffic managers from the Air Traffic Control System Command Center (ATCSCC) generally took a facilitation role, coordinating with the local traffic managers to identify the constraint, develop recommended reroutes, and assess modeling results. Traffic managers from Air Route Traffic Control Center (ARTCC) Traffic Management Units (TMUs) provided needed local expertise. Customer participants provided the perspectives of commercial dispatchers and air traffic coordinators as well as general aviation flight planners.

Participants in the first two evaluations included FCT team members; ARTCC representatives included Boston Center (ZBW), Fort Worth Center (ZFW), and Cleveland Center (ZOB); Customer representatives included Northwest Airlines, American Airlines, Atlantic Southeast Airlines, NetJets and National Business Aviation Association (NBAA). In addition to the operational participants, other FCT members from the Volpe National Transportation Systems Center and Ohio State University also attended.

The third evaluation involved a much larger audience with new participants joining from the FET to create the joint FCT/FET ICR Implementation Team. FAA FET members included representatives from the ATCSCC, Training Department, Washington (ZDC) and Minneapolis Centers (ZMP). Delta Airlines was represented on the customer side. Computer Sciences Corporation was present to evaluate impacts on the Traffic Flow Management Modernization (TFM-M) Program.

MITRE/CAASD and Metron Aviation staff facilitated all evaluations and provided technical expertise on the prototype tools as necessary.

2.2 Evaluation Environment

The three Initial ICR evaluations were conducted at The MITRE Corporation's Center for Advanced Aviation System Development (CAASD) lab facilities in McLean, VA. ETMS Tools (e.g., Traffic Situation Display (TSD)), Reroute Monitor, and the prototype Common Constraint Situation Display (CCSD)) were connected to the live ETMS test string. MITRE/CAASD's Collaborative Routing Coordination Tools (CRCT) and the research version of Metron Aviation's Route Management Tool (RMT-R) were also available for participants. The ETMS 8.1 test string was used for the first two evaluations. The May 2006 exercise was conducted after the MITRE lab and Traffic Flow Management Data to Industry (TFMDI) site were converted to the ETMS 8.2 test string. The design was to set up a realistic lab environment using only the tools (prototype versions) that would be available in the ETMS 8.3 timeframe (Fall 2006).

Each evaluation was made up of a series of runs with each run focusing on a different area of interest or concern. Different weather scenarios were used (or in some cases, the same FCA with different filters). Several scenarios used in the Full ICR evaluations were revisited for comparison purposes.

2.2.1 Laboratory Set-Up

All participant positions were co-located in the MITRE lab for the Initial ICR evaluations. Note that this was unlike the Full ICR HITLs, where FAA positions were in the lab and customers were located in a nearby conference room. For the Initial ICR evaluations, all participants could observe what the other parties were doing to better understand the process from a different perspective. FAA and customer positions were separated somewhat by a partition, see diagram in Figure 2-1. Phone conversations (e.g., planning telcons) were simulated as well (run by the ATCSCC facilitator). Advisories were created as identified in the concept steps and distributed to participants.

Three FAA positions (2 ARTCC, 1 ATCSCC) and two customer positions were set up for the December 2005 and January 2006 evaluations. Each FAA position included a Linux workstation with ETMS capabilities, and a laptop computer with RMT-R/ROG. Note that in

the first evaluation, a second Linux workstation with CRCT running FTD was also used. Customer positions had a laptop running both the RMT-R/ROG and CCSD prototypes.

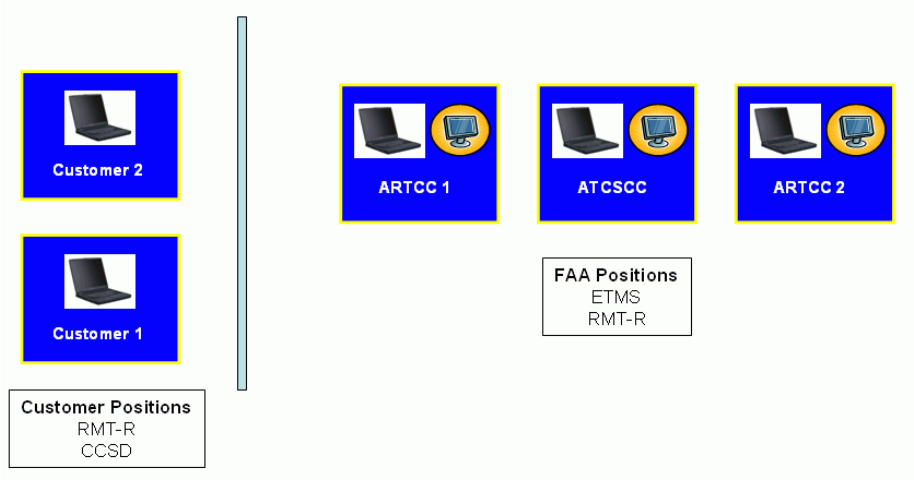

Figure 2-1. Initial ICR Lab Setup

For the May 2006 exercise, two large monitors were brought into the lab to better accommodate the larger group. The computer screen from the active display was projected onto the two large screens. Two FAA positions (1 ARTCC, 1 ATCSCC) were available for traffic managers, and one customer position was set up on the other side of the partition.

2.2.2 Prototype Tools Used in the Evaluations

Most ETMS capabilities were available for FAA traffic managers. The TSD was used for monitoring traffic and creating FCAs. The Create Reroute tool was used for creating Advisories (Planning and Required) and the Reroute Monitor for monitoring customer-submitted reroute preferences (EI messages).

Specific ICR-related ETMS 8.3 enhancements were discussed in detail at the May 9, 2006 exercise (see the evaluation materials for more information). The final list of enhancements planned for deployment includes:

- Replace Historical Route with Assigned Route
- Retain FCA Dropouts when Reroute is Re-issued
- Modify Route Prefix on Reroute Monitor (distinguish required from non-required reroutes)
- Show Non-Conformant Centers “in Red”
- Draw Assigned Routes for Individual Flights

- Preview Reroutes on Map
- Display Reroute Advisory Text on TSD
- EI Route Formatting (allow space separators instead of dots)
- Bucket Reroute Monitor Timeline by FCA Entry Time

A research version of the Route Management Tool (RMT-R) including the ROG capabilities was available at both the FAA and customer positions. A process was developed for the evaluations in which RMT-R obtained the FCA definitions and associated flight lists files from the Traffic Flow Management Data to Industry (TFMDI) site. Enhancements were also incorporated into the ROG Traffic Management Initiative (TMI) Builder based on feedback/discussion at previous ICR evaluations. Specifically, improved mapping capabilities and measures of play impact, e.g., average and maximum additional distance for flights affected by different plays were developed. Historical Ad Hoc reroute databases were created for each of the customer participants using Post Operations Evaluation Tool (POET) queries. These ad hoc databases were available along with the pre-coordinated databases (CDRs, Plays and ATC Preferred Routes) in the ROG Tool and were used as a surrogate for customer flight planning systems.

Customers used the prototype CCSD on the CDM DataGate to submit their reroute preferences to the system. An airline 'super user' was setup so that customers at the evaluations could submit EI messages for their own flights and for several others that were not present. Route options were selected from RMT-R/ROG and cut and pasted into the CCSD EI window. Customers also used the CCSD Reroute Monitor and FEA Dynamic Flight Lists for monitoring purposes.

CRCT's Future Traffic Display (FTD) capability was available at the FAA positions for use by traffic managers for the Phase 1 Evaluation in December 2005. The capabilities were not used in the second and third evaluations, once it was known for certain that FTD would not be implemented in ETMS 8.3.

2.2.3 Data Collection Process

Group discussions were held after each run was conducted. The various stakeholders described what worked best and worst during each run from their perspective. At the end of each evaluation, a briefing summarizing the results was presented and discussed with the group. The FEA/FCA definitions and flight lists for each run were captured for post-evaluation. Several examples appear in Section 3. Because the ETMS test string was used for these evaluations, limited data archiving was available.

3 Initial ICR Concept Evaluations

This section describes the three ICR Concept evaluations conducted in FY06. It is important to note that prototype tools connected to the live ETMS test string were used for the three evaluations. The benefit in that approach was to provide a realistic simulation of the Initial ICR capabilities. One disadvantage observed during the evaluation runs was that several customer-submitted EI messages were overridden by messages received by the test string from the operational system, sent by their Operations Centers. For these evaluations, the FEA start times were moved further into the future so that the EI messages were less likely to be overridden.

One of the primary objectives for all of the evaluations described in this section was to determine whether the initial phases of the ICR Concept were viable and operationally acceptable to both FAA traffic managers and customers. Traffic managers were concerned about the limited capabilities available for monitoring customer-submitted routes (reroute modeling and FTD are not available in Initial ICR). Other objectives included continuing concept refinement and identification of remaining issues.

3.1 First Human-in-the-Loop Evaluation

An Initial ICR/Phase 1 ICR HITL evaluation was held in December 2005. FTD capabilities (part of ICR Phase 1) were included in the first HITL. Several potential weather scenarios were presented to the group for consideration. Three HITL runs were conducted during this evaluation using the following scenarios:

- Run 1 – New York Center (ZNY) westbound departures affected by constraint on J80 east of Pittsburgh, CDRs via J60, J36 and J6 were recommended

  FCA Times: 18:45-23:45Z, Alt: 0-600, ~ 95 flights included

- Run 2 – Dallas-Fort Worth (DFW) arrivals affected by weather in the vicinity of Little Rock (LIT)

  FCA Times: 18:00-23:00Z, Alt: 0-600, ~ 45 flights included

- Run 3 – ZNY, ZOB, ZDC arrivals affected by constraint extending from mid-Illinois into Michigan

  FCA Times: 18:00-23:00Z, Alt: 0-600, ~ 45 flights included

The group made the following observations:

- Customers could successfully submit EI messages to the system quickly and easily using ROG (note that some followed reroute guidance, some did not).

- Cases where Preferential Departure Routes and Preferential Departure and Arrival Routes conflicted with EIs were noted in this evaluation.
- Concept Refinement – Required (RQD) advisories can be used to communicate routes to the customers for their remaining flights and any additional restrictions in support of the reroute (e.g., miles in trail or capping).
- The concept should remain flexible, allowing the option to include any level of route guidance.

Traffic managers identified the following potential benefits of Initial ICR:

- If customers are given options, traffic may be dispersed over multiple routes.
- EIs submitted early better inform the traffic managers of what the customers want to do; this can help with reroute planning.

Traffic managers found that the Phase 1 Concept needs to explicitly address the collaboration process between the national and local traffic managers for:

- Evaluating the acceptability of EIs
- Selecting routes appropriate for the remaining flights (reroute guidance)
- Involving local traffic managers earlier in the process

Traffic managers expressed concern about the limited capabilities available for evaluating EIs and their impact. It was suggested that different ways of effectively and 'creatively' using FTD to explore EIs should be investigated. A need for easily discerning EIs graphically (especially the non-conformant routes) was identified. It was also noted that a methodology should be developed to assess workload reductions for reroutes with collaboration.

At the suggestion of the FCT group, a 'Mini'-HITL was held in the MITRE lab in late December with FCT researchers and the FCT ATCSCC representative exploring different scenarios and the interaction between Create Reroute and ROG.

3.2 Second Human-in-the-Loop Evaluation

The second evaluation was held in January 2006. It was determined that FTD would not be implemented in ETMS 8.3. Therefore, the decision was made to include only Initial ICR capabilities and FTD was not used. The first day was designated as a half day training session for new participants. The following HITL runs took place on days two and three:

- Run 1 – Weather in the Midwest impacting eastbound jet routes (Figure 3-1)

  FCA Times: 21:30-04:29Z, Alt: 200-600, ~ 64 flights included

- Run 2 – Weather in ZDC impacting north/south jet routes (Figure 3-2)

  FCA Times: 20:15-01:15Z, Alt: 200-600, ~ 152 flights included

- Run 3 – Weather in the Midwest impacting westbound jet routes (Figure 3-3)

  FCA Times: 21:15 – 01:15Z, Alt: 200-600, ~ 105 flights included

Note that in the figures below illustrating the scenarios used in the HITL runs, the constrained areas (FCAs) are shown in yellow. Airports with departures on the associated flight list are shown in red; airports with arrivals are shown in blue.

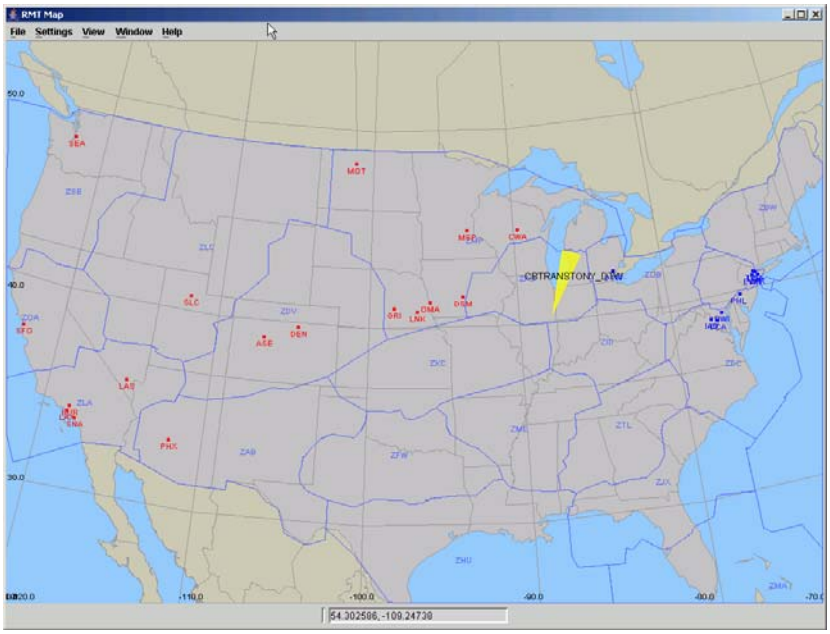

Figure 3-1. Jan 2006 HITL Scenario Run 1

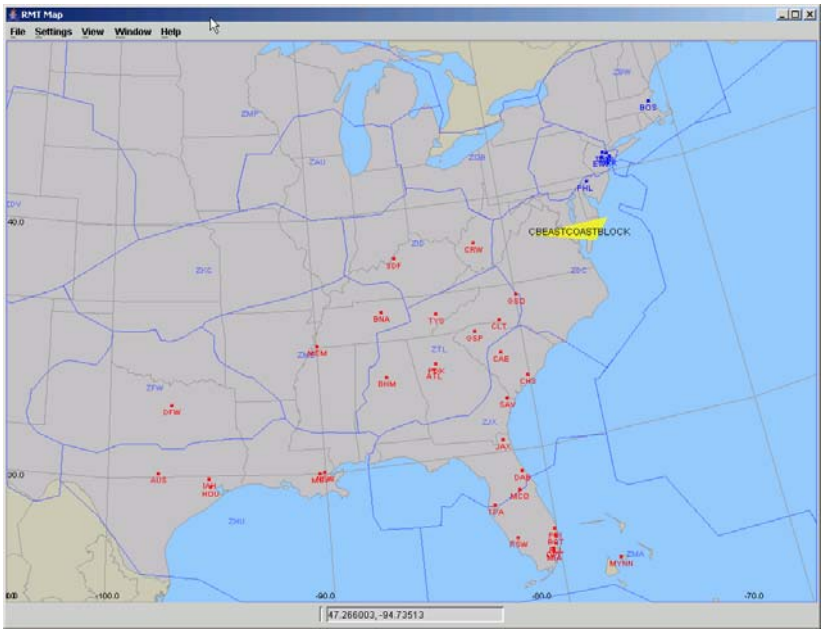

Figure 3-2. Jan 2006 HITL Scenario Run 2

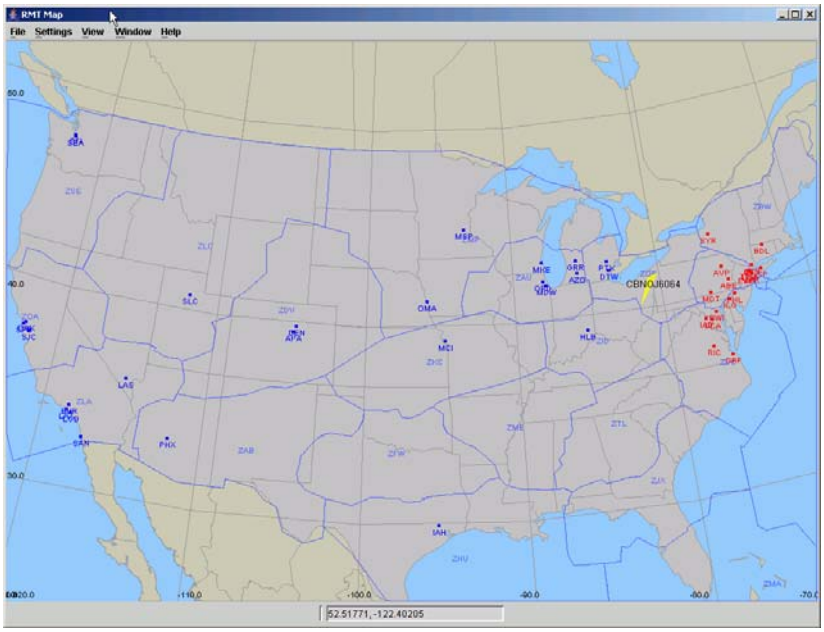

Figure 3-3. Jan 2006 HITL Scenario Run 3

The group made the following observations:

- Some parts of the Initial ICR Concept can be done in today's environment; field experiments or operational tests may be feasible in summer 2006. The concept is similar to what is currently being done with Play A761.
- Future exercises should focus on ZNY departures and mid-country scenarios. East Coast arrival scenarios were not as successful.
- Additional route guidance should be captured in advisory remarks, e.g., altitude limits and guidance for choosing CDRs.
- The ROG TMI Builder was useful for developing route guidance.
- Customers would like to send EI messages directly to the system from ROG.
- Without FTD, traffic manager workload in Centers receiving the customer-submitted options is still a concern.
- Customers and traffic managers would like to see EI flights in the Reroute Monitor list after the final RQD Route Advisory is issued.

The following potential benefits for Initial ICR were identified:

- Fewer requests for exemptions
- Shorter secondary restrictions (such as miles in trail)
- Fewer tactical traffic management actions
- Fewer departure center and tower route amendments
- More customer flexibility to choose what's better for them (e.g., choosing CDRs out of New York)
- Earlier customer route predictability

Several suggestions were made for ICR Tool enhancements:

- A graphical display of individual EI routes is needed (expected in ETMS 8.3)
- A measure of Play impact on the ROG TMI Builder would be useful
- On FTD, flag EI traffic
- On FTD, pick a CDR to apply for modeling

3.3 Transition Exercise

The third evaluation was held in May 2006 with the newly formed FCT/FET ICR Implementation Team. The primary objective for this transition exercise was for the FCT to formally hand-off the Initial ICR Concept to the implementation team. The focus on day one was to familiarize new participants with the Initial ICR Concept and capabilities to be used in the exercise. First, an in-depth ICR concept briefing was presented, which discussed the following key elements of Initial ICR:

- Planning Route Advisory with reroute guidance for customers
- ROG capabilities in RMT which identify pre-coordinated reroute options that avoid the constraint
- Customer reroute preferences submitted to the system via EI or refiling
- Use of Reroute Monitor to identify whether flights followed advisory guidance

Specific ICR related items planned for deployment in ETMS 8.3 were described in detail (see Section 2.2.2 for the list of enhancements and the May 9, 2006 HITL presentation materials for further information). Demonstrations of the ROG Tool and ICR use of ETMS and CCSD capabilities followed. The concept was demonstrated in the lab by walking through the concept steps using a training scenario with facilitators. The additional monitors brought into the lab allowed the larger group to see the details of what was happening on each of the tools. Two of the FEAs from the January HITL were used for training purposes (Scenarios from Runs 1 and 3 described above in Section 3.2).

Participants had some hands-on practice using the tools themselves on day two during a facilitated concept walk-through. An FEA was created in the Midwest with approximately 75 flights on the flight list. National traffic managers used ROG to develop route guidance. Customers submitted EIs for approximately half of the flights on the list. Traffic managers had some difficulty judging whether EIs were valid or not because of the lack of local (Memphis and Atlanta) expertise.

Much of the May evaluation involved discussing and clarifying the key concept elements with Implementation Team members new to the concept. Discussion topics included customer incentives for participation and the differences from the current FEA/FCA process. One key point that was stressed was that once the ICR FEA and filters are defined, all flights on the list need to be rerouted, either by the customers themselves through EI or by the FAA in a RQD Route Advisory. That differs from the current process, where traffic managers may not take further action if enough flights move themselves out of the constrained area, which provides no incentive for customers to participate (i.e., why volunteer to incur additional flight time when there is a chance that other flights will, and your flights won't need to be rerouted).

Other observations noted by the group:

- Reroute Monitor may be needed in the towers for identifying acceptable routes.
- Customers have a trade-off in selecting routes. If a customer ad hoc route is significantly shorter than the recommended route, they will likely choose to submit the ad hoc route. If the customer route and recommended routes are close, customers said they may be inclined to submit the recommended route to be sure the route is accepted.
- A critical mass of customers must participate to make the process worthwhile (30-50 percent participation was ventured as a guess). The concept represents a lot of work for a lot of people if there is only 5 percent participation. It may be that AFP training could serve as a model to get adequate participation.
- Traffic managers expressed some concern and asked the following questions: Does Initial ICR provide enough benefit to be worth it? Does it include enough capabilities to fairly evaluate good/bad routes?

The following potential benefits for Initial ICR were identified:

- One advantage noted by customers is that ICR is more strategic than the current process; the FAA is taking action hours in advance. Customers submitting EIs will often get shorter preferences that just avoid the FCA. Non-participants may be put on longer Playbook routes.
- National traffic managers saw the potential for ICR benefits in scenarios where many flights are not covered by CDRs or Playbook Plays. Without the ICR process, those flights would have to be rerouted tactically. The more EIs received, the less work would be needed to prepare the RQD Route Advisory. The national traffic managers agreed Playbook Plays may need to be revisited to add lesser-used routes.

Several specific issues were identified that needed further work by the Implementation Team:

- Defining the ICR timeline and sequence of events (e.g., the FCT has discussed creating the Planning Advisory two hours ahead with a 30 minute EI window)
- Developing new procedures and the coordination process for approval of non-conformant EIs
- Identifying scenarios that will and will not work
- Developing training materials

4 Summary and Next Steps

Three evaluations were conducted in FY06 to refine and validate the Initial ICR concept, the first step in a phased approach for improving the rerouting process. ICR is an enhanced, more collaborative version of rerouting that involves customers early in the process and allows them to submit preferences for reroutes. As a result of evaluations held in FY05 and FY06, the FCT recommended the ICR concept and the associated capabilities for implementation. The CDM leadership has designated a joint FCT/FET Sub-Team to oversee the implementation of the Initial ICR Concept. The initial automation capabilities are planned for deployment in ETMS and RMT in Fall 2006.

4.1 Issues

Some issues identified in the evaluations will need to be addressed by the Implementation Team. In some cases, these issues may not be resolved until future implementations of ICR capabilities.

1. How much structure is needed in the route guidance for the Planning (PLN) Route Advisory and do EI routes need to be required to choose one of those routes? During the HITL exercises, the more structure was required, the harder it was for customers to find acceptable routes that avoided the constrained area. Traffic manager participants noted that offering basic route guidance allowed them to quickly spot routes that did not conform to that guidance. They could then determine whether those routes were acceptable. This shifted their focus from developing routes for flights that weren't covered by the plays to considering the impact of customer-submitted route preferences.
2. Is using the EI message an adequate and acceptable method for customers to submit their route preferences in response to a PLN Route Advisory that solicits their preferences? Traffic managers expressed concern about whether customers would actually use EI to collaborate in this way. Customers noted that submitting route preferences via EI messages could be cumbersome and was not currently integrated with their internal company processes.
3. Is Initial ICR appropriate for use two to four hours before a constraint is expected to impact traffic? On one hand, is that enough time to do the iterative coordination, and far enough in advance to catch flights before they depart? On the other hand, is this too early, so that uncertainty about whether the constraint will actually develop discourages customers from participating?

4.2 Next Steps

The first meeting of the joint FCT/FET ICR Implementation Team was described above in Section 3.3. The next Implementation Team meeting is planned for September 2006. The

agenda includes addressing both procedures and training issues. The Initial ICR capabilities recommended by the FCT group (see the Initial ICR Functional Requirements document [5] for specific details) are planned for deployment in the fall of 2006 in ETMS 8.3 and RMT 1.40.

The Full ICR Concept is still being managed by the FCT team. Lessons learned and concept refinements will be discussed with the Implementation Team and incorporated into the Full ICR concept as the Initial ICR capabilities are used operationally. The FCT also plans to continue researching possible integration opportunities with Airspace Flow Programs (AFPs). Some Initial ICR automation capabilities have been identified that may help with problems found during the initial AFP implementation in the summer of 2006. Further integration of the two concepts and development of best practices may lead to additional benefits for both FAA traffic managers and customers.

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Glossary

AFP	Airspace Flow Program
ARTCC	Air Route Traffic Control Center
ATC	Air Traffic Control
ATCSCC	Air Traffic Control System Command Center
CAASD	Center for Advanced Aviation System Development
CCSD	Common Constraint Situation Display
CDM	Collaborative Decision Making
CDR	Coded Departure Route
CRCT	Collaborative Routing Coordination Tools
CRI	Constraint Resolution Intent
DFW	Dallas-Fort Worth International Airport
EI	Early Intent
ETMS	Enhanced Traffic Management System
FAA	Federal Aviation Administration
FCA	Flow Constrained Area
FCT	Future Concepts of Flow Management Sub-Team (formerly the ICE-FM Working Group)
FEA	Flow Evaluation Area
FET	Flow Evaluation Team
FTD	Future Traffic Display
FY05	Fiscal Year 2005
FY06	Fiscal Year 2006
HITL	Human-in-the-Loop
ICE-FM	Integrated Concepts for the Evolution of Flow Management (now the FCT)
ICR	Integrated Collaborative Rerouting
LIT	Little Rock (navaid)
NAS	National Airspace System
NBAA	National Business Aviation Association
PLN	designator for a “Planning” Route Advisory
POET	Post Operations Evaluation Tool

RMT	Route Management Tool
RMT-R	Route Management Tool – Research Version
ROG	Route Options Generation
RQD	designator for a “Required” Route Advisory
TFM	Traffic Flow Management
TFMDI	Traffic Flow Management Data to Industry
TFM-M	Traffic Flow Management Modernization
TMI	Traffic Management Initiative
TMU	Traffic Management Unit
TSD	Traffic Situation Display
ZBW	Boston Center
ZDC	Washington Center
ZFW	Fort Worth Center
ZMP	Minneapolis Center
ZNY	New York Center
ZOB	Cleveland Center