ACN25091/4
COPY 1

DOT/FAA/CT-ACN25091/4

FAA WJH Technical Center
00026445

FINAL

NAS OPERATIONAL TEST AND EVALUATION/INTEGRATION OF THE INTERIM MONITOR AND CONTROL SOFTWARE (IMCS) VERSION R07.1

LETTER OF FINDINGS

FEDERAL AVIATION ADMINISTRATION
JUL 22 1991
TECHNICAL CENTER LIBRARY
ATLANTIC CITY INTL ARPRT. NJ 08405

Frances M. Bayne

May 1991

Document is on file at the Technical Center
Library, Atlantic City International Airport, N.J. 08405

Engineering, Test, and Evaluation Service
Communications/Navigation/Surveillance Division
Weather & Remote Maintenance Monitoring Systems Branch
FAA Technical Center
Atlantic City International Airport, N.J. 08405

1. INTRODUCTION.

This Letter of Findings details the results of the National Airspace System (NAS) Operational Test and Evaluation (OT&E)/Integration of the Interim Monitor and Control Software (IMCS), version R07.1. ACN-250 conducted the NAS OT&E/Integration of the IMCS and its interface to the Maintenance Management System (MMS), version A03.3, under the GUARDIAN operating system, version C30, of Tandem Computers Incorporated. Functional requirements for the NAS OT&E/Integration of the IMCS were derived from NAS-SS-1000, Volumes I and V. ACN-250 conducted the NAS OT&E/Integration of the IMCS according to the following documents: (a) NAS OT&E/Integration of the IMCS Test Plan and (b) NAS OT&E/Integration of the IMCS Test Procedures.

Remote Monitoring Subsystem (RMS) inputs to the Maintenance Processor Subsystem (MPS) were provided via RMS simulators, since the use of operational RMSs for testing was not feasible. Air Traffic Control Beacon Interrogator (ATCBI-5) RMS simulators, both Common Digitizer Type 1 (CD-1) and Type 2 (CD-2), were chosen for their data base integrity and ease of use. An Air Route Surveillance Radar (ARSR) with CD-1 Remote Control Interface Unit (RCIU) simulator was chosen to provide an RMS that does not conform to NAS-MD-790.

1.1 PURPOSE.

The purpose of the NAS OT&E/Integration of the IMCS was to determine if IMCS performed in the same manner under version C30 as it had when running under version B40 of the GUARDIAN operating system.

1.2 DATE.

ACN-250 conducted the NAS OT&E/Integration of the IMCS from November 27, 1990, through January 31, 1991.

1.3 LOCATION.

ACN-250 conducted the NAS OT&E/Integration of the IMCS on the ACN-250 Maintenance Processor Subsystem (MPS), at the Federal Aviation Administration (FAA) Technical Center, Atlantic City International Airport, New Jersey.

1.4 PARTICIPANTS.

The participants of the NAS OT&E/Integration of the IMCS were:

a. Douglas Ruth (CTA)
b. Thomas Miller (UAL)

2. IMCS VERSION R07.1 TEST RESULTS.

2.1 IT1 - IMCS SYSTEM INITIALIZATION AND FAULT RECOVERY TEST.

The IMCS System Initialization and Fault Recovery Test validates that the IMCS is properly installed on the MPS, and that the IMCS correctly performs fault recovery. IT1 is composed of two test sequences: IMCS System Initialization Test (IT1.1) and IMCS Fault Recovery Test (IT1.2).

2.1.1 IT1 Results.

The IMCS passed all IT1.1 test sequences.

ACN-250 did not conduct the IMCS Fault Recovery Test (IT1.2), because the MPS was configured as an unmirrored system. ACN-250 will conduct IT2.1 during follow-on testing.

2.1.2 IT1 Recommendations.

ACN-250 has no recommendations.

2.2 IT2 - IMCS DATA MONITORING TEST.

The IMCS Data Monitoring Test validates that the IMCS provides access to the site status screen(s) for an RMS and displays the RMS's monitored parameters.

2.2.1 IT2 Results.

Although the IMCS passed all IT2 test sequences, a problem unrelated to the test sequence occurred. For no apparent reason, a link level communications failure occurred between the MPS and the RMS simulator for an extended period of time. The IMCS never indicated that the communications failure had occurred.

This is a major exception.

2.2.2 IT2 Recommendations.

ACN-250 recommends that the IMCS indicate to the user all reportable link level communications failures which occur.

2.3 IT3 - IMCS COMMAND TEST.

The IMCS Command Test validates the capability of the IMCS to properly transmit commands to an RMS. In addition, IT3 validates the capability of the IMCS to identify invalid command parameters input by the user. IT3 is composed of two test sequences: Command Test (IT3.1) and Invalid Command Test (IT3.2).

2.3.1 IT3 Results.

The IMCS passed all IT3 test sequences with the following exceptions:

a. The IMCS does not clear the parameter list after transmitting a command to the RMS. (This exception was initially reported in the IMCS Letter of Findings for version PCB0703.)

This is a major exception.

b. The IMCS allows commands with invalid parameters to be transmitted to an RMS. (This exception was initially reported in the IMCS Letter of Findings for version PCB0703.)

This is a minor exception.

c. The IMCS does not update the Site Status screen when the ARSR CD-1 RCIU simulator responds to the STATUS command. (This exception was initially reported in the IMCS Letter of Findings for version PCB0703.)

This is a minor exception.

2.3.2 IT3 Recommendations.

ACN-250 recommends the following:

a. The IMCS should clear the command parameters after transmitting a command to an RMS.

b. The IMCS should test for and reject invalid command parameters prior to transmitting a command to an RMS.

c. The Site Status screen should always be updated to reflect the latest status information transmitted from an RMS.

In addition, ACN-250 recommends that the user be allowed to page through the Command List screens for a specific RMS instead of requiring the user to exit the Command List screen, exit the Site Status screen, select a new Site Status screen from the Main Menu screen, select the Command List screen, reenter the password, and then select the next command to be transmitted.

2.4 IT4 - IMCS ALARM TEST.

The IMCS Alarm Test validates the capability of the IMCS to properly process and display Alarm messages from an RMS. It also validates the capability to acknowledge active Alarm messages via the IMCS.

2.4.1 IT4 Results.

The IMCS passed all IT4 test sequences. However, ACN-250 observed that the IMCS does not update the Active Alarms screen while it is being displayed. (This exception was initially reported in the IMCS Letter of Findings for version PCB0703.)

This is a minor exception.

2.4.2 IT4 Recommendations.

ACN-250 recommends that the IMCS update the Active Alarms screen while it is being displayed.

2.5 IT5 - IMCS/MMS INTEGRATED FUNCTION TEST.

The IMCS/MMS Integrated Function Test validates that the IMCS functions properly while executing various MMS functions. IT5 is composed of three test sequences: MMS Logging Activity Subsystem Test (IT5.1), MMS PM/CERT Scheduling Subsystem Test (IT5.2), and MMS Report Generation Subsystem Test (IT5.3). Additional information regarding testing of IMCS/MMS concurrent operations may be found in the NAS OT&E/Integration of the MMS Letter of Findings for version A03.3.

2.5.1 IT5 Results.

The IMCS passed all IT5 test sequences.

2.5.2 IT5 Recommendations.

ACN-250 has no recommendations.

2.6 IT6 - IMCS UTILITY SUBSYSTEM TEST.

The IMCS Utility Subsystem Test validates that the IMCS data base and history files can be maintained using the Utility Subsystem, and that proper security functions are implemented. IT6 is composed of three test sequences: Database Add Utility Test (IT6.1), Database Delete Utility Test (IT6.2), and Archive Utility Test (IT6.3).

2.6.1 IT6 Results.

The following exceptions were noted during the IT6 test sequences:

a. The DBADAP file requires unique data to be entered into certain fields of each record. The IMCS does not provide a warning message to the user when duplicate data is entered into one of these fields.

This is a minor exception.

b. Although the IMCS indicated that the archive reports were initiated, they were not printed. Because of this, ACN-250 made no attempt to create the archive tapes. (This exception was initially reported in the IMCS Letter of Findings for version PCB0703.)

This is a major exception.

2.6.2 IT6 Recommendations.

ACN-250 recommends the following:

a. The IMCS should provide a warning message when the DBADAP file is updated and duplicate data are entered into fields which require unique data.

b. The IMCS should monitor the report generation process and provide a message when the report is completed.

2.7 IT7 - IMCS REPORT SUBSYSTEM TEST.

The IMCS Report Subsystem Test validates that the IMCS provides the capability to generate a report of selected information from the DBCS (current status), DBH (history), and DBUSERH (user history) files.

2.7.1 IT7 Results.

The IMCS Report Subsystem Test (IT7) was not successful. Although IMCS indicated that the DBCS, DBH, and DBUSERH reports were initiated, they were not printed. The problem is attributed to the report destination field being truncated. These reports were printed when IMCS ran under the B40 version of the operating system.

NOTE: This is the only significant difference that ACN-250 could detect between IMCS running under the B40 versus C30 operating system.

This is a major exception.

2.7.2 IT7 Recommendations.

ACN-250 recommends that the IMCS monitor the report generation process and provide a message which indicates whether the report was successfully produced.

3. ACN-250 OPEN AND CLOSED EXCEPTIONS.

Table 3-1 on the following page lists the open exceptions identified by ACN-250 during the past and present test efforts.

TABLE 3-1. ACN-250 IMCS EXCEPTIONS REPORT

DESCRIPTION OF EXCEPTION	VERSION DETECTED	CURRENT STATUS
IMCS DATA MONITORING TEST		
IMCS failed to indicate link level communications failure	R07.1	OPEN
IMCS COMMAND TEST		
IMCS does not clear parameter list after transmitting command	PCB0703	OPEN
IMCS allows commands with invalid parameters to be transmitted to RMS	PCB0703	OPEN
IMCS does not update Site Status screen when ARSR CD-1 simulator responds to STATUS command	PCB0703	OPEN
IMCS ALARM TEST		
IMCS does not update Active Alarms screen while it is displayed	PCB0703	OPEN
IMCS UTILITY SUBSYSTEM TEST		
IMCS does not provide warning when duplicate data entered into certain fields of DBADAP file records	R07.1	OPEN
DBH and DBUSERH archive summary/exception reports not printed	PCB0703	OPEN
IMCS REPORT SUBSYSTEM TEST		
DBCS, DBH, and DBUSERH reports not printed	PCB0703	OPEN