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FINAL

NAS OPERATIONAL TEST AND EVALUATION/INTEGRATION OF THE MAINTENANCE MANAGEMENT SYSTEM (MMS) VERSION A03.4

LETTER OF FINDINGS

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FEDERAL AVIATION ADMINISTRATION

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1. INTRODUCTION.

This Letter of Findings details the results of the National Airspace System (NAS) Operational Test and Evaluation (OT&E)/Integration of the Maintenance Management System (MMS) conducted on the ACN-250 Maintenance Processor Subsystem (MPS) located at the Federal Aviation Administration (FAA) Technical Center, Atlantic City International Airport, New Jersey. ACN-250 conducted the NAS OT&E/Integration of the MMS, version A03.4, and its interfaces, including the Interim Monitor and Control Software (IMCS), version R07.2, from February 25 through March 27, 1991.

Version A03.4 comprises enhancements and modifications to the MMS Phase I baseline software. Phase I includes Periodic Maintenance/Certification Scheduling (PM/CERT), Report Generation, Facility/Service/Equipment Profiles (FSEP), Logging, and Administration, along with interfaces to the IMCS, TRANSFER/MAIL application of Tandem Computers Incorporated, and the National Airspace Performance Reporting System (NAPRS).

The functional and performance requirements for the testing were derived from NAS-SS-1000, Volumes I and V, and the MMS Software Requirements Specification. The performance requirements were not verified during this test effort but will be verified during the MPS Performance Test, as outlined in the MPS Performance Test Plan.

1.1 PURPOSE.

The purpose of the test was to verify the following:

a. The software and its supporting documentation are consistent;

b. Software modifications, to correct problems or resolve items detailed in the Program Technical Reports (PTRs) for version A03.4, have been implemented as described in the following document: Version Description Document for the Maintenance Management System (CSCI) (Version A03.4) of RMMS Maintenance Processor Subsystem, January 31, 1991, Unisys/VNTSC;

c. Functionality of the software is not degraded due to software enhancements or modifications; and

d. Exceptions noted in the NAS OT&E/Integration of the MMS Test Report, version A03.2, and Letter of Findings, version A03.3, have been corrected or resolved.

1.2 DATE.

ACN-250 conducted the test from February 25 through March 27, 1991.

1.3 LOCATION.

ACN-250 conducted the test on the ACN-250 MPS, at the FAA Technical Center, Atlantic City International Airport, New Jersey.

1.4 PARTICIPANTS.

Cheryl Krouse (ACN-250), Edward Palka (CTA), and Corey Bolling (CTA) conducted the test.

2. MMS VERSION A03.4 INTEGRATION TEST RESULTS.

2.1 IT1 - MMS/IMCS INITIALIZATION/LOADING TEST.

The MMS/IMCS Initialization/Loading Test validates that the MMS and IMCS are properly installed on the MPS. Demonstrations via terminal screen displays and printouts of MMS files are used to verify that the MMS and IMCS are correctly initialized/loaded. The PATHWAY configuration was verified for the MMS version A03.4 and IMCS version R07.2.

2.1.1 IT1 Results.

Several IT1 test sequences failed due to the following exception:

While following the installation instructions, ACN-250 encountered no problems until step #7. At the OBEY PATHCOLD command, the IMCS COBOL servers failed on startup. ACN-250, with assistance from the Unisys personnel in Washington, DC, determined the failure to be caused by the lack of a COBOL85 run-time library on the ACN-250 \ACTA Tandem Computer System. To correct the problem, ACN-250 requested and received a new CUSTFILE from Tandem Computers Incorporated, which included the COBOL85 run-time library. ACN-250 performed a SYSGEN to install the COBOL85 run-time library on \ACTA. When \ACTA was brought up on the new Operating System Image, ACN-250 performed a PATHCOLD, which resulted in no visible errors. The full MMS/IMCS PATHWAY ran successfully. ACN-250 completed the remaining installation instructions without problems.

This is a major exception.

NOTE: Presently, only the IMCS requires the COBOL85 library to execute successfully. However, lack of the COBOL85 library on the ACN-250 MPS is not attributable to a deficiency in either the MMS or the IMCS. ACN-250 identified the deficiency as an exception in both the MMS and IMCS Letters of Findings, because the MMS/IMCS installation instructions could not be completed without the COBOL85 library.

2.1.2 IT1 Recommendations.

ACN-250 recommends the following:

The COBOL85 run-time library should be included in the C30 operating system update tape.

2.2 IT2 - MMS SECURITY INTERFACE TEST.

The MMS Security Interface Test validates that the MMS provides the following: (a) the mechanism to control logon access and access to the MMS functions, (b) the mechanism to establish screen time-out periods, (c) the means to turn off the MMS PM/CERT scheduling processes, (d) access to the IMCS, (e) access to the EMA component, (f) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (g) no degradation to the operations of the NAS.

2.2.1 IT2 Results.

The MMS passed all IT2 integration test sequences.

2.2.2 IT2 Recommendations.

ACN-250 has no recommendations.

2.3 IT3 - MMS REPORT GENERATION SUBSYSTEM TEST.

The MMS Report Generation Subsystem Test validates that the MMS provides the following: (a) generation of standard reports, (b) access to the Tandem PERUSE utility, (c) printing of standard reports for each MMS subsystem, (d) obtaining the status of generated reports, (e) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (f) no degradation to the operations of the NAS.

2.3.1 IT3 Results.

The MMS passed all IT3 integration test sequences with the following exception:

The following occurred when attempting to produce the VCOSTC and AUTHINIT reports: When an invalid value was entered in the subsector field and the Tandem PERUSE utility was accessed to obtain the status of the report, an error code of 5120 (end of file reached) was displayed. (This exception was initially reported in the MMS version A03.3 Letter of Findings.)

This is a minor exception.

2.3.2 IT3 Recommendations.

ACN-250 recommends the following:

For various fields on the Report Generation screen, MMS does not always perform a validity check on the data entered as selection criteria for certain reports. When MMS does not perform a validity check on the data entered for a given field, and no records match the selected criteria, the report should be printed with its header followed by the message NO RECORDS FOUND. This recommendation applies to all reports.

2.4 IT4 - MMS FSEP SUBSYSTEM TEST.

The MMS FSEP Subsystem Test validates that the MMS provides the following: (a) the mechanism for maintaining a record of all facilities, services, and equipment that constitute the NAS, (b) generation of standard FMF data sets, (c) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (d) no degradation to the operations of the NAS.

2.4.1 IT4 Results.

The MMS passed all IT4 integration test sequences.

2.4.2 IT4 Recommendations.

ACN-250 has no recommendations.

2.5 IT5 - MMS LOGGING ACTIVITY SUBSYSTEM TEST.

The MMS Logging Activity Subsystem Test validates that the MMS provides the following: (a) the mechanism for recording pertinent information about all

activities relating to facility maintenance logs and interrupt reporting, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.5.1 IT5 Results.

The MMS passed all IT5 integration test sequences with the following exception:

When returning to the Logging Activity Subsystem Menu screen from any Logging Activity Subsystem function screen, the time displayed is not the current system time. (This exception was initially reported in the MMS version A03.3 Letter of Findings.)

This is a minor exception.

2.5.2 IT5 Recommendations.

ACN-250 recommends the following:

Since the time is not displayed on any other subsystem screen and is not required on the Logging Activity Subsystem Menu screen, ACN-250 recommends that the time be deleted from the Logging Activity Subsystem Menu screen and displayed only on the Logging Activity Subsystem function screens (where it is required). If the decision is made to keep the time on the Logging Activity Subsystem Menu screen, ACN-250 recommends that the time be updated to the current system time upon return to the Logging Activity Subsystem Menu screen from any Logging Activity Subsystem function screen.

2.6 IT6 - MMS PM/CERT SCHEDULING SUBSYSTEM TEST.

The MMS PM/CERT Scheduling Subsystem Test validates that the MMS provides the following: (a) the mechanism to support the creation and maintenance of the master file used to schedule and assign personnel and/or crews to perform periodic maintenance tasks and facility/service certifications, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.6.1 IT6 Results.

The MMS passed all IT6 integration test sequences.

2.6.2 IT6 Recommendations.

ACN-250 has no recommendations.

2.7 IT7 - MMS ADMINISTRATION SUBSYSTEM TEST.

The MMS Administration Subsystem Test validates that the MMS provides the following: (a) functions for the MMS System Administrator to control access levels and maintain the reference files, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.7.1 IT7 Results.

The MMS passed all IT7 integration test sequences.

2.7.2 IT7 Recommendations.

Although the MMS passed all IT7 integration test sequences, ACN-250 has the following recommendation:

When the delete (SF10) is pressed on the System Control Parameters (ASY) subfunction screen, the user should be prompted with ARE YOU SURE YOU WANT TO DELETE THIS RECORD? SF10 = DELETE SF1 = NO. This could prevent an accidental deletion of a system control parameter.

2.8 IT8 - MMS EMA COMPONENT TEST.

The MMS EMA Component Test validates that the MMS provides the following: (a) the capability for users to access the Tandem TRANSFER/MAIL to compose, alter, read, file, delete, print, and send messages to/from other terminals at the MPS node and to/from other MPS nodes, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.8.1 IT8 Results.

The MMS passed all IT8 integration test sequences.

2.8.2 IT8 Recommendations.

ACN-250 has no recommendations.

2.9 IT9 - MMS DATA ENTRY/HELP/FUNCTION KEY TEST.

The MMS Data Entry/Help/Function Key Test validates that the MMS provides the following: (a) the capability for users to enter, edit, error check, search, and print alphanumeric data, (b) the capability for users to obtain help to determine the purpose and operating procedure for any function, (c) unused function keys which remain inactive when depressed, (d) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (e) no degradation to the operations of the NAS. A portion of this test was conducted during other tests when the Help function was accessible.

2.9.1 IT9 Results.

The MMS passed all IT9 integration test sequences.

2.9.2 IT9 Recommendations.

ACN-250 has no recommendations.

2.10 IT10 - IMCS INTERFACE TEST.

The IMCS Interface Test validates that the MMS provides the following: (a) the capability for users to display and acknowledge alarms from an RMS simulator, via the IMCS interface, while in the MMS, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.10.1 IT10 Results.

The MMS passed all IT10 integration test sequences.

2.10.2 IT10 Recommendations.

ACN-250 has no recommendations.

2.11 IT11 - MMS/NAPRS CONVERSION TEST.

The MMS/NAPRS Conversion Test validates that the MMS provides the following: (a) the capability to build daily NAPRS data files, (b) the capability to automatically generate NAPRS reports for AF sectors, (c) the capability to download the NAPRS data files to a PC from the MPS, (d) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (e) no degradation to the operations of the NAS.

2.11.1 IT11 Results.

The MMS passed all IT11 integration test sequences.

2.11.2 IT11 Recommendations.

ACN-250 has no recommendations.

2.12 IT12 - TRANSFER NETWORK UPDATE INTERFACE TEST.

The Transfer Network Update Interface Test validates that the MMS provides the following: (a) the capability to access the Tandem TRANSFER Delivery System to transmit FSEP Subsystem file updates of replicated data and designated entries in the Logging Activity Subsystem to other MPS nodes running the MMS application, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.12.1 IT12 Results.

The MMS failed several IT12 integration test sequences due to the following exception:

FSEP Subsystem file updates and designated entries in the Logging Activity Subsystem were unable to be transmitted to a designated MPS node (i.e., ACT).

This is a major exception.

2.12.2 IT12 Recommendations.

ACN-250 recommends the following:

The MMS software should be modified to enable FSEP Subsystem file updates and designated entries in the Logging Activity Subsystem to be transmitted to a designated node.

2.13 IT13 - PTR TEST.

The PTR Test validates that PTRs identified as resolved in the Version Description Document (VDD) have been incorporated correctly into the version under test.

2.13.1 IT13 Results.

The MMS incorporated all PTRs as described in 3.8 of the VDD for version A03.4.

2.13.2 IT13 Recommendations.

ACN-250 has no recommendations.

2.14 IT14 - MMS EXTENDED FUNCTIONS SUBSYSTEM TEST.

The MMS Extended Functions Subsystem Test validates that the MMS provides the following: (a) MMS Phase II capabilities when they are incorporated as operational or prototype subsystems for evaluation, (b) new functionality and/or modifications, as applicable, consistent with the associated documentation, and (c) no degradation to the operations of the NAS.

2.14.1 IT14 Results.

The MMS passed all IT14 integration test sequences with the following exception:

While on the SYSTEM ACCESS screen, a user can enter any three-letter access code in the F1=GO TO field as long as the code begins with the letter "T", and access to the Test Equipment and Calibration Menu is allowed. (This exception was initially reported in MMS version A03.3 Letter of Findings.)

This is a minor exception.

2.14.2 IT14 Recommendations.

ACN-250 recommends the following:

A correction in the MMS software should be made to allow only valid codes to be accepted to access the TEST EQUIPMENT AND CALIBRATION MENU from the SYSTEM ACCESS screen.

3. ACN-250 OPEN AND CLOSED EXCEPTIONS.

Table 3-1 on the following page lists the open exceptions identified by ACN-250 during past and present test efforts, together with the exceptions closed during the current test phase (i.e., A03.3, A03.31, and A03.4).

TABLE 3-1. ACN-250 MMS EXCEPTIONS REPORT

DESCRIPTION OF EXCEPTION	VERSION DETECTED	CURRENT STATUS
MMS/IMCS INITIALIZATION/LOADING TEST		
COBOL85 run-time library not installed on MPS	A03.4	OPEN
MMS REPORT GENERATION SUBSYSTEM TEST		
validity check not always performed on selection criteria data	A03.3	OPEN
MMS LOGGING ACTIVITY SUBSYSTEM TEST		
inconsistent messages displayed when user retrieves records	A03.2	OPEN
displayed time not current system time upon return to Logging Menu screen	A03.3	OPEN
MMS DATA ENTRY/HELP/FUNCTION KEY TEST		
documentation and software inconsistent: MAIN MENU versus SYSTEM ACCESS	A03.2	OPEN
MMS/NAPRS CONVERSION TEST		
TACL sets for volume and subvolume set to test configuration	A03.3	CLOSED A03.31
unable to download daily NAPRS data file from MPS to PC	A03.3	CLOSED A03.4
TRANSFER NETWORK UPDATE INTERFACE TEST		
TRANSFER not transmitting updates to designated MPS node	A03.4	OPEN
MMS EXTENDED FUNCTIONS SUBSYSTEM TEST		
access allowed to TEC subfunction with T followed by any two letters	A03.3	OPEN
return to EXT SYS ACCESS screen when F2 pressed for PCT, FSC, and NPR	A03.3	CLOSED A03.4