N
5/11

FEDERAL AVIATION ADMINISTRATION
OCT 1 1 1996
TECHNICAL LIBRARY
ATLANTIC CITY INT'L AIRPORT, NJ 08405

technical note technical note

New Generation Runway Visual Range (RVR) Final Operational Test and Evaluation Report: Volume II

William Benner
Thomas Carty

July 1996

DOT/FAA/CT-TN95/32-II

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

U.S. Department of Transportation
Federal Aviation Administration

William J. Hughes Technical Center
Atlantic City International Airport, NJ 08405

DOT/FAA
CT-TN
95/32-II
c. 1

FAA Technical Center
00016059

DOT/FAA Benner, William, et al.
CT-TN New generation runway visual
95/32-II range (RVR) final operational
c. 1 test and evaluation...

FAA
TECHNICAL CENTER
Atlantic City, N.J.

NOTICE

This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

The United States Government does not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the objective of this report.

Technical Report Documentation Page

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT/FAA/CT-TN95/32-II		

4. Title and Subtitle	5. Report Date
New Generation Runway Visual Range (RVR) Final Operational Test and Evaluation Report: Volume II	July 1996
	6. Performing Organization Code ACW-200B
7. Author (s) William Benner, Thomas Carty; Michael Jones, Raytheon Service Co.	8. Performing Organization Report No. DOT/FAA/CT-TN95/32-II
9. Performing Organization Name and Address U.S. Department of Transportation Federal Aviation Administration Technical Center Atlantic City International Airport, N.J. 08405	10. Work Unit No. (TRAIS)
	11. Contract or Grant No.
12. Sponsoring Agency Name and Address U.S. Department of Transportation Federal Aviation Administration Technical Center Atlantic City International Airport, N.J. 08405	13. Type of Report and Period Covered Technical Note March 1992 - June 1994
	14. Sponsoring Agency Code

15. Supplementary Notes

This effort was performed in cooperation with FAA Technical Center (ACW-200B) personnel and project personnel from Raytheon Service Company in Pleasantville, New Jersey.

16. Abstract

This report summarizes Operational Test and Evaluation (OT&E) activities for the New Generation Runway Visual Range (RVR) system. Testing consisted of an initial OT&E, seven individual retests and several specialized tests. DOT/FAA/CT-TN92/37 provides results of the initial OT&E conducted in March 1992. This document summarizes results of seven retests as well as specialized tests conducted from August 1992 through June 1994.

The purpose and intent of OT&E was to verify RVR National Airspace Requirements (NAS) and to verify the operational effectiveness and suitability of the RVR within the NAS environment.

At the completion of the retest and specialized test efforts results indicated that the most significant sensor and system problems had been resolved via permanent design changes as well as interim "work-arounds." It was recommended that the RVR system be deployed nationally under the following conditions:

a. Additional data be obtained indicating RVR performance during Category IIIb visibility; and

b. Problems currently having interim work-around solutions be resolved with permanent corrections.

This volume contains appendices A through G referenced in Volume I.

17. Key Words	18. Distribution Statement
New Generation Runway Visual Range (RVR) Retest, Specialized Tests Look-Down Visibility Sensor Modification	Document is on file at the Technical Center Library, Atlantic City International Airport, NJ 08405

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	209	

Form DOT F 1700.7 (8-72) Reproduction of completed page authorized

APPENDIX A
RETEST 1
OT&E Operational, Integration, and Shakedown Reports

ACW-200 QUICK LOOK REPORT
RUNWAY VISUAL RANGE REGRESSION TESTING

BACKGROUND

The "new generation" Runway Visual Range (RVR) will provide a measurement of runway visual range data at various points along a precision runway in support of Instrument Landing System/Microwave Landing System (ILS/MLS) Category I, II, IIIa/b landing and takeoff operations. The functions of the RVR include the data acquisition and processing of the atmospheric scattering coefficient; the ambient luminance; and the runway light intensity. These functions, when processed, yield the distance along a departure or approach runway that a pilot may be expected to see. The new generation RVR equipment will decrease the maintenance load and reduce the installation difficulties associated with the current system design. Future expansion capabilities will be easier and less costly.

The data from the new generation RVR will be sent to the Maintenance Processor Subsystem (MPS), the Maintenance Data Terminal (MDT), The Automated Surface Observing System (ASOS), and the Tower Control Computer Complex (TCCC). The principal users of this data are the air traffic controllers (ATC) accessing the RVR Controller Displays (CD) located in the Airport Traffic Control Tower (ATCT) and the Terminal Radar Approach Control (TRACON).

The new generation RVR was installed at 14 major airports around the United States. Reliability Development Growth Testing (RDGT) was conducted on the RVR at these airports from December 1990 through June 1991. The goal of the RVR program is to commission the equipment at 520 airports nationwide.

INTRODUCTION

This report provides preliminary results of the RVR Operational Test and Evaluation (OT&E)/Integration Regression Testing led by the Weather/Primary Radar Division, ACW-200, 8/17 through 8/21/92. Testing was conducted at Kansas City International (MCI) ATCT, in Kansas City, MO; and the Kansas City Air Route Traffic Control Center (ZKC ARTCC), in Olathe, KS.

Personnel from the following organizations conducted and supported OT&E/Integration Regression Testing:

1. Kansas City International Airport (MCI):

Organization	Role
ACW-200	Test Director
ACN-100D	Test Manager
ACN-100D/CTA	(2) Test Engineers
ANN-140/SEIC	(1) Technician
MCI AFSFO	(2) Technicians

2. Kansas City ARTCC (ZKC):

Organization	Role
ACN-100D/CTA	Test Engineer
ZKC SPS	(1) MPS Administrator

TEST PHILOSOPHY

RVR OT&E Integration Regression Testing was conducted to verify previously reported Test Trouble Reports (TTRs) were corrected after contractor modifications were made to the RVR firmware and the Interim Monitor and Control Software (IMCS). The Regression Test consisted of testing the (1) RVR/MPS interface via the RVR IMCS decoder module and the (2) RVR/MDT interface.

OT&E/Integration Regression Testing was based upon the NAS System Specification NAS-SS-1000, Volume I - V. These requirements are outlined in the Test Verification Requirements Traceability Matrices (TVRTM) in the RVR Master Test Plan (MTP), and in the RVR OT&E/Integration Test Plan.

TEST CONFIGURATION

The RVR Regression Test configuration utilized the RVR system at the Kansas City International ATCT and the MPS at the Olathe, KS ARTCC.

The RVR was tested using the following hardware configuration:

1) one Data Processing Unit (DPU);

2) four Visibility Sensors (VS);

3) two Runway Light Intensity Monitors (RLIM)

4) one Ambient Light Sensor (ALS).

The IMCS decoder module was installed and tested in the MPS Tandem Computer, configured on an independent pathway.

TEST APPROACH

The RVR OT&E/Integration Regression Test was conducted on the MPS and the MDT interfaces using the test procedures dated November 15, 1991. The testing included verification of fixes for 20 existing Test Trouble Reports (TTRs) that were found during the OT&E/Integration Test of February 1992. The TTRs were grouped into Category A (RVR/MPS) and Category B (RVR/MDT). Test data was collected, TTRs were completed and events were summarized daily. A brief team meeting was held on the last day of testing at MCI. Testing was performed via a modem hookup between the RVR DPU at MCI and the MPS at ZKC.

The software that was tested during regression testing was the latest version available (i.e. a successor to the software tested during OT&E/Integration testing). All 20 existing TTRs were tested along with other timing and sensitivity tests.

TEST CONDUCT

The initial test performed was the link-level test which uses the RMS/MPS simulator in the tower with a modem link to the ARTCC MPS and an RS-232 link to the RMS. This test verifies communication status between the RVR and RMS and the RMS and MPS.

The monitoring test TTRs were tested followed by the command, diagnostic command, alarm and remote certification test TTRs. The timing commands were then tested to determine system response to status and alarm commands. Visibility sensor testing was also performed. The alarms due to power disconnect on the personality and controller cards at the sensor were timed.

TEST RESULTS

There were approximately 20 new TTRs found during the regression testing. Data analysis is currently being performed by ACN-100D and may produce additional TTRs. Of the TTRs opened during OT&E/Integration testing 11 were closed (tested successfully) and nine remain open. The status is as follows:

a. monitoring test TTRs: (1-6) all six closed;
b. command test TTRs: two closed (13,14), two remain open (15,20);
c. diagnostic command TTRs: one closed (16), one remains open (17);
d. alarm test TTRs: two closed (9, 11), four remain open(7, 8, 10, 12);
e. remote certification test TTRs: zero closed, two remain open (18, 19).

Visibility sensor alarms due to power disconnect on the personality and controller cards at the sensor worked correctly and were timed. However, several attempts were made to contaminate the transmit and receive windows to trigger alarms. This was not successful.

Personnel safety, accuracy (Volpe National Transportation Systems Center study), and fail-safe issues remain open and were not addressed during regression testing.

PRELIMINARY CONCLUSIONS

Although eleven of the 20 TTRs documented during OT&E/Integration testing were closed during this phase of regression testing, at least four critical and one major TTR remain open. The validity of the TTRs generated during the regression will be verified during data analysis. Additional TTRs may also be found during data analysis.

Based on preliminary test results, ACW-200 recommends the following actions be taken prior to deployment:

a) software modifications that address the discrepancies found during RVR OT&E/Integration testing and RVR OT&E regression testing and regression test analysis must be corrected and retested successfully;

b) verification that personnel safety, accuracy (Volpe study), and fail-safe issues contained in the OT&E/Integration test report have been addressed and corrected.

ACN-100D is still analyzing test data. Upon completion of this analysis, a final OT&E/Integration Regression Test Report will be submitted. A formal memorandum containing all TTRs and supporting data will also be submitted.

AOS REPORT FOR RETEST 1

ACTION: Interim Operational Test and Evaluation Shakedown Test Report for the New Generation RVR (FA-10268)

Manager, Environmental Support Engineering Branch, AOS-220

Weather Processor Test Director, ACW-200B

Additional shakedown testing on the Runway Visual Range (RVR) System, FA-10268, continued on September 1-4, 1992, supplementing the preliminary shakedown testing conducted March 18-27, 1992, at the Kansas City International Airport. This shakedown testing concentrated on software changes made by Teledyne Controls as a result of the software issues from the initial OT&E.

Discrepancies/Improvement issues that were observed during the September testing are as follows:

a. There is no audible alarm when the Controller Display presents all FFF's for the RVR product caused by various equipment failures. (Form Number 67)

b. The corrected extinction coefficient and uncorrected extinction coefficient are the same values before the rain filter times out. (Form Number 68)

c. The 1-hour RVR product archive dump runs in an infinite loop. (Form Number 69)

d. The four VS's extinction coefficients were significantly different on a bright sunny day. (Form Number 72)

e. The rain event filter period and snow clogging filter time periods do not operate as suggested on DPU screen 21. (Form Number 73)

f. The instruction book page changes have not been reviewed or validated. The archive data as well as the new rain and snow algorithm are not explained in the technical instruction book. (Form Numbers 77 and 78)

g. The calculation for the RVR product should use the lower of the edge and centerline light settings. The higher is presently being used. (Form Number 80)

h. With an ambient light reading of 2 footlamberts and no runway lights on the RVR product was 60+. The test team questions whether a pilot could actually see a mile or more down the runway. (Form Number 81)

i. The Configuration Option screen is not complete. The RLTM configuration is not displayed. (Form Number 82)

In the interim shakedown report dated May 20, 1992, the RVR Discrepancy/Improvement Forms were listed by form number. The following is a list of the unresolved discrepancies/improvements by form number: 1-4, 6, 9-32, 35, 36, 38-44, 46, 48-50, 52-54, 56, 57, 59, and 62-65. The following are the deployment critical issues raised in the interim report and their present status.

a. The EPROM's tested in the system may not be the production EPROM's that will be installed in all the RVR's. It was reported that some EPROM's were changed after the September testing, and no changes have been noted in the EPROM revision level. This may be a configuration management problem. (Form Number 58) Discrepancy active.

b. The feet/meter switch can still be inadvertently switched. (Form Number 3) Discrepancy active.

c. The accuracy of the system remains in question as the test team was unable to test the system in inclement weather. (Form Number 4) Discrepancy active.

d. The RVR product now follows its associated runway on the Controller Display (CD). (Form Number 5) Discrepancy cleared.

e. The RVR product is still affected by the contamination on the window. The RVR product went up when the window was contaminated presenting a false reading of better visibility. (Form Number 6) Discrepancy active.

f. The corrections to the FAA Facility Standard drawings have not been reviewed by the test team. (Form Numbers 9, 10, 11, 20, 21, 22, & 24) Discrepancy active.

g. The Off-Site Technical Instruction Book is not available to baseline the system and provide required documentation for the support organizations. (Form Number 31) Discrepancy active.

h. Component Level/Automatic Test Equipment/Automatic Test Station training has not been conducted for support organizations. (Form Number 36) Discrepancy active.

i. The contamination gain value is incorrect such that the window contamination affects the RVR product. The setting of 0.95 and 1.2 did not correct the problem. (Form Number 44) Discrepancy active.

j. The SIE EMI cover is a safety hazard. (Form Number 48) Discrepancy active.

k. The ALS and VS SIE batteries do not keep the units on line when AC power is lost. (Form Number 49) Discrepancy active.

l. The SIE battery can be disconnected and there is no warning. (Form Number 52) Discrepancy active.

m. The RLIM does not have adequate fault detection and fail-safe operation. (Form Number 54) Discrepancy active.

n. The fault diagnostics software/firmware discrepancy had been corrected. (Form Number 55) Discrepancy cleared.

In order to understand and properly verify the operation and accuracy of the RVR, the test team requests the engineering report on RVR sensor accuracy and the resulting algorithm changes. Of particular concern are the contamination gain, algorithms for snow and rain, and the appropriate settings.

The test team tentatively plans to visit the John A. Volpe NTSC after review and initial evaluation of the report. A visit to the RVR sensor accuracy test facility may also be appropriate.

To support the accuracy of the system we suggest that several reliability test sites be used to obtain comparison data in inclement weather. The test should run for 90 to 120 days.

Based on the review of the shakedown test results to date, we recommend that the RVR system not be deployed. Resolutions of these items should be completed before the shakedown effort is continued.

David W. Fleming

Attachments
RVR Discrepancy/Improvement Form

cc:
Official file
AOS-200/ANN-140/ANN-200/AAF-11/ASM-100/ACE-420/FAA AFSFO
Kansas City, MO/FAA QRO Wilbert Bentley
AOS-220:Sanayi:cln:X4996:9/29/92 (RVR2.RPT)

APPENDIX B
RETEST 2
OT&E Operational, Integration, and Shakedown Reports

ACN REPORT FOR RETEST 2

TO: Darren Fields

FROM: C Szlaczky

DATE: December 17, 1992

SUBJECT: Test Trouble Reports for the RVR Integration Re-test of 9 November to 17 November 1992.

Attached you will find three (3) copies of the updated TTRs (001-065). The re-test, R02, was performed from November 9 through 17, 1992.

Changes to the original set of TTRs are, 17 new TTRs (TTRs 049-065), 12 TTRs closed (007, 010, 021, 022, 026, 031, 037, 038, 043, 044, 045, 047) and 3 TTRs with follow-up status (024, 025, 029).

If you have any questions or comments regarding these TTRs, please feel free to call Ray Haines (645-5069) or myself (645-5031 or 484-4316).

cc: R. Haines
P. Friel
P. Spillane
RVR Files

ACW REPORT FOR RETEST 2

TEST REPORT

RUNWAY VISUAL RANGE (RVR)

OPERATIONAL TEST AND EVALUATION (OT&E)

REGRESSION TEST II

FEBRUARY 4, 1993

PREPARED BY:

WEATHER/PRIMARY RADAR DIVISION, ACW-200

1. Introduction

This report provides results of the Runway Visual Range (RVR) OT&E Integration and OT&E Operational Regression Testing conducted by the Weather/Primary Radar Division, ACW-200 and the Maintenance Automation Program, ACN-100D. The subject testing was the second round of regression tests to be conducted on the RVR system, and will be referred to as OT&E Regression Test II for the remainder of this report. OT&E Regression Test II was conducted at Kansas City International Airport (MCI) from November 9, 1992 through November 18, 1992.

Personnel from the following organizations conducted and supported the regression testing:

Organization/Role

ACW-200 Test Director
ACN-100D Test Engineer
ACN-100D/CTA (2) Test Engineers
ANN-140 Observer
Airway Facilities
Sector Field Office (AFSFO) (2) Technicians

The OT&E Integration and OT&E Operational testing was based upon the National Airspace System (NAS) requirements identified by the RVR Test Verification Requirements Traceability Matrices (TVRTMs) in the RVR Master Test Plan and the RVR OT&E Integration Test Plan.

2. Background

2.1 System Description

The "New Generation" Runway Visual Range (RVR) will provide a measurement of runway visual range data at various points along a precision runway in support of Instrument Landing System/Microwave Landing System (ILS/MLS) Category I,II,IIIa/b landing and takeoff operations. The functions of the RVR include data acquisition and processing for determination of the atmospheric scattering coefficient, the ambient luminance, and the runway light intensity. These functions, when processed, yield the distance that a pilot may be expected to see along a departure or approach runway. The New Generation RVR equipment will decrease the maintenance load and reduce the installation difficulties associated with the current system design. Future expansion capabilities will be easier and less costly.

In it's present design configuration, the RVR interfaces with the Maintenence Processor System (MPS) and a Maintenance Data Terminal (MDT). Future upgrades will include interfaces to the Automated Surface Observation System (ASOS), and the Tower

Control Computer Complex (TCCC).

The principal users of RVR data are air traffic controllers (ATC) utilizing the RVR Controller Display (CD) located in the Air Traffic Control Tower (ATCT) and the Terminal Radar Approach Control (TRACON).

The RVR has been installed at 14 major airports around the United States. Reliability Development Growth Testing (RDGT) was conducted on the RVR at these airports from December 1990 through June 1991. The goal of the RVR program is to commission the equipment at 520 airports nationwide.

2.2 Summary of formal test and evaluation

2.2.1 Visibility Sensor Evaluation

Volpe National Transportation Systems Center (VNTSC), Cambridge, MA, conducted an evaluation of the RVR Visibility Sensors from 13 December 1991 through 1 June 1992 at the Otis Weather Test Facility at Cape Cod, MA. This testing was intended to verify that the accuracy and calibration consistency of the Forward-Scatter Visibility Sensors are in compliance with the requirements of the RVR System Specification. The findings outlined in the test report issued by VNTSC indicated that the Teledyne Sensors tested met the requirements of the RVR specification. However, the findings also indicated that problems with unexpected system shutdowns were encountered during snow and rain events. To prevent the system from shutting down during snow and rain, it was necessary to disable the algorithm which allows the system to compensate for contamination on the Visibility Sensor Windows. As a result of the above-mentioned problems, Teledyne has developed snow and rain filters which are intended to eliminate the type of problems encountered at Otis. These filters were not incorporated into the software version tested at Otis.

2.2.2 OT&E Integration and OT&E Operational Tests

OT&E Integration and OT&E Operational Testing was conducted from 25 February 1992 through 13 March 1992. An evaluation of the RVR Controller Display by air traffic controllers was also conducted during this period. Testing was conducted at Kansas City International (MCI) Airport and the Kansas City (ZKC) Air Route Traffic Control Center (ARTCC) in Olathe, KA.

2.2.2.1 OT&E Test Results

The OT&E Integration and OT&E Operational Tests resulted in 20 Test Trouble Reports (TTRs) being generated. The breakdown of the TTRs is shown below:

Critical: 4

Major: 2

Minor: 11

Annoyance: 2

Other: 1

2.2.3 OT&E Integration and OT&E Operational Regression Test I

OT&E Integration and OT&E Operational Regression Test I was conducted August 17 through August 21, 1992. Testing was conducted at Kansas City International (MCI) Airport and the Kansas City (ZKC) Air Route Traffic Control Center (ARTCC) in Olathe, KA.

2.2.3.1 OT&E Regression Test I Results

Fifteen of the original 20 TTRs were closed as a result of testing; however, some were reopened as new trouble reports because the previous discrepancy had been only partially resolved. In addition, new TTRs were opened as a result of new discrepancies that were discovered. The breakdown of TTRs remaining open following the first regression test is as follows:

Critical: 5

Major: 9

Minor: 9

Annoyance: 5

3. OT&E Integration and OT&E Operational Regression Test II

3.1 OT&E Regression Test II Objectives

The objectives of OT&E Regression Test II included:

(1) Verify fixes incorporated by the system vendor in response to previous Test Trouble Reports (TTRs).

(2) Exercise all areas of system functionality necessary to verify proper system operation.

(3) Verification of compliance with NAS-SS-1000 requirements.

3.2 Test Configuration

OT&E Regression Test II was conducted utilizing the uncommissioned RVR system installed at the Kansas City Airport and the Maintenance Processor Subsystem (MPS) located at the FAA Traffic Center in Olathe, KS. The MPS was connected to the Remote Monitoring System (RMS) interface of the RVR via dedicated phone line. A Maintenance Data Terminal (MDT) was employed to allow control and monitoring of the MPS from the Kansas City location.

The Kansas City Airport RVR system consists of the following hardware configuration:

(1) one data processing unit (DPU)

(2) four Visibility Sensors (VS)

(3) two Runway Light Intensity Monitors (RLIM)

(4) one Ambient Light Sensor (ALS)

The software configuration tested used an unreleased engineering prototype software version. This version had not been subjected to Software Quality Testing by the vendor. Rain and snow filters which were developed as a result of the Otis testing discussed in Section 2.2.1 were incorporated in this software version. The RVR Interim Monitor and Control Software (IMCS) module in the MPS Tandem Computer was configured as a stand-alone system in a separate pathway.

3.3 Test Conduct

OT&E Regression Test II was conducted on the MDT and MPS interfaces using the test procedures dated November 15, 1991 as a guideline for verification of system performance. Individual tests were conducted to verify fixes for TTRs previously written against the RVR system. Testing included verification of requirements and fixes for both the RVR/MPS and RVR/MDT interfaces.

At the start of testing, 28 TTRs were open. Of the 28, 16 were related to the RVR system, and 12 were related to the IMCS software.

Test data were collected, Test Trouble Reports were completed, and events were summarized daily. MPS and MDT data were captured to files for later analysis.

At the conclusion of testing, a test team meeting was held to discuss the results of the tests and account for the disposition of both previous and newly generated TTRs. MCI site management personnel were debriefed on the test conduct and results.

4. OT&E Regression Test II Results

At the conclusion of testing, 12 TTRs had been closed. Seventeen new TTRs were opened as a result of testing and post analysis. None of the new TTRs is considered critical. The breakdown of TTRs presently open is as follows:

Critical:	2
Major:	10
Minor:	15
Annoyance:	6

The breakdown of TTRs in relation to the responsible subsystem is as follows:

RMS	15
IMCS	15
MDT	1
Other	2

4.1 Integration

The currently available NAS interfaces include the MPS and the MDT. The TTRs presently open against these interfaces, along with copies of all other TTRs currently open, are contained in Appendix A.

4.2 Product Edit Notification

When in the Manual Products Edit screen, the Controller Display (CD) gives no indication that manual data has been entered into the system and that the product displayed could be invalid.

4.3 Sensor Interface Electronics (SIE) Batteries

There is no monitoring of battery condition unless batteries are on-line. The result is the possibility of a battery failure remaining undetected until AC power is lost. See Test Trouble Report 008 in Appendix A.

During loss of AC, the SIE uses the batteries to maintain configuration information only. Communication with the DPU ceases; therefore, the system is essentially off-line.

4.4 Loss of Calibration

Both the Ambient Light Sensor (ALS) and a Visibility Sensor (VS) lost calibration during testing. The ALS lost its calibration as a result of a power down, and a single VS lost calibration during a cold restart of the system. The other Visibility Sensors retained their calibration. See Test Trouble Reports 055-R02 and 056-R02 in Appendix A.

4.5 MDT Readability

Maintenance Data Terminal is virtually unreadable in sunlight. As a result, local testing of Visibility Sensor SIE is extremely difficult. See Test Trouble Report 064-R02 in Appendix A.

4.6 MDT User Interface

Maintenance Data Terminal user interface is cryptic and cumbersome. Parametric data must be converted using a scaling factor to arrive at actual value of data item. Cursor keys are inoperative; therefore, cursor must be moved serially through all data fields in order to get from top to bottom of screen. Screens are not consistent in layout, operation or terminology. See Test Trouble Reports 029-R01, 052-R02 and 054-R02 in Appendix A.

4.7 Security

Passwords for all users are available for viewing at MPS when Password Change screen is selected. See Test Trouble Report 051-R02 in Appendix A.

4.8 Failsafe

As noted in the initial OT&E Final Test Report dated 2 June 1992, the RVR system continues to output erroneous products with a simulated failure of a Runway Light Intensity Monitor.

5. Recommendations

The actions described in 5.1 along with resolutions for any TTRs classified as Critical or Major are essential to ensure the suitability of the RVR and must be accomplished prior to deployment. The actions described in 5.2 and resolutions to TTRs classified as Minor or Annoyance should be accomplished after deployment.

The items listed in this section are in addition to any items not specifically mentioned but still outstanding from previous OT&E testing.

5.1 Deployment Critical Recommendations

5.1.1 Software

Upon modifications to correct, as a minimum, all existing deployment-critical items, the software should be baselined and undergo Software Quality Test (SQT).

Upon completion of SQT by the vendor, a retest should be performed by ACW-200B/ACN-100D to verify corrections. The retest shall also verify proper system operation by exercising system functions and interfaces.

5.1.2 Product Integrity

The RVR should be modified to inhibit product output at the CD in the event of any system failure, including sensors, that affects the normal input to the RVR algorithm.

5.1.3 Visibility Sensor Evaluation

The software version used for accuracy and calibration testing at the Otis Weather Test Facility did not contain the snow and rain filtering algorithms that are part of the version tested at Kansas City. In addition, the window correction algorithm of the software version used at Otis was disabled during the accuracy testing to prevent system shutdown during snow and rain events. Because the above-mentioned algorithms can affect the RVR product, sensor data collected during the initial testing at Otis should be used as input to the production release software to verify that the resultant RVR products are consistent with those obtained during the initial Visibility Sensor Evaluation.

5.1.3.1 Filter Optimization

Despite the addition of rain and snow filtering algorithms, it was discovered that the RVR system at Kansas City had shut down for 4 hours during a snow storm which occurred less than a week after the conclusion of regression testing. It is believed that

the shutdown occurred as a result of less-than-optimal settings of the snow and rain filter parameters. Optimal settings for the filters should be determined, and additional testing should be conducted to verify that the system will remain on-line under all weather conditions.

5.1.4 Maintenance Processor Subsystem

The RVR IMCS module should be installed and tested in the same operational pathway with the other existing, operational IMCS modules.

5.2 Additional Recommendations

The items listed below are in addition to any items not specifically mentioned but still outstanding from initial OT&E Integration, OT&E Operational testing or previous OT&E Regression testing.

5.2.1 SIE Batteries

RVR should be modified to: (1) provide an alarm to the RMS whenever an SIE battery voltage drops below a pre-determined threshold regardless of whether the SIE is powered by AC or battery; and, (2) enable the SIE dew heater circuit to operate regardless of SIE power source.

5.2.2 Loss of Calibration

The cause of the loss of calibration on the ALS and VS sensors should be determined and modifications made to prevent further occurrences. Recalibrating sensors is a time consuming task. Given that resets, power interruptions etc. can be expected during poor weather conditions it is likely that a loss of calibration would occur when the RVR system is needed most.

5.2.3 Product Edit Notification

The CD should notify the controller in some manner any time an SIE failure is overridden or ALS/RLIM data is entered manually via the Product Edit Screen.

5.2.4 MDT Readability

Consideration should be given to replacing the present MDT used on RVR with one that is readable in bright sunlight.

5.2.5 MDT User Interface

The Maintenance Data Terminal user interface should be redone to improve the user friendliness and efficiency of the maintenance functions. A more modern 'windows' or menu driven approach

should be taken. In addition, all units displayed should be 'real world' and not require conversion to be understood by a technician.

5.2.6 Security

Software changes should be made either in the IMCS or in the RVR to prevent passwords from being viewed via the MPS interface.

5.2.7 Safety

All RVR sites should be provided with a winch for use in lowering or raising VS poles.

6. ABBREVIATIONS AND ACRONYMS

AFSFO	Airway Facilities Sector Office
ALS	Ambient Light Sensor
ARTCC	Air Route Control Center
ASOS	Automated Surface Observation System
ATCT	Airport Traffic Control Tower
CCD	Configuration Control Decision
CD	Controller Display
CTS	Coded Time Source
DPU	Data Processing Unit
DT&E	Development Test and Evaluation
IMCS	Interim Monitor and Control Software
FAA	Federal Aviation Administration
LRU	Lowest Replaceable Unit
MCI	Kansas City International Airport, MO
MDT	Maintenance Data Terminal
MPS	Maintenance Processing System
MPU	Maintenance Processing Unit
MTP	Master Test Plan
NAS	National Airspace System
OT&E	Operational Test and Evaluation
PPU	Product Processing Unit
RDGT	Reliability Development Growth Test
RLIM	Runway Light Intensity Monitor
RMS	Remote Monitoring Subsystem
RVR	Runway Visual Range
SAT	Site Acceptance Test
SIE	Sensor Interface Electronics
TCCC	Tower Control Computer Complex
TRACON	Terminal Radar Approach Control
TVRTM	Test Verification Requirements Traceability Matrix
UIC	User Identification Code
VNTSC	Volpe National Transportation System Center
VS	Visibility Sensor
ZKC	Kansas City ARTCC

APPENDIX C
RETEST 3
OT&E Operational, Integration, and Shakedown Reports

ACN REPORT FOR RETEST 3

TEST TROUBLE REPORT (TTR) SUMMARY

This Summary presents the results of the National Airspace System (NAS) Operational Test and Evaluation (OT&E)/Integration retest of the Runway Visual Range (RVR), Remote Monitoring Subsystem (RMS). The retesting was performed from June 14, 1993 through June 25, 1993 at the Kansas City International Airport (MCI), Kansas City, Missouri. The Maintenance Processor Subsystem (MPS) was located at the Air Route Traffic Control Center (ARTCC) in Olathe, Kansas. The MPS utilized the Tandem operating system version C30, which ran the Interim Monitor and Control Software (IMCS) version PCC0702, through a separate PATHWAY. The LM1 protocol analyzer, version 8.0 and the ACD-350 Enhanced MPS Simulator, version 1.01 were used as test tools. ACN-100D, ACD-350, and ACN-200D representing the Federal Aviation Administration (FAA) Technical Center, ANN-400, representing the Maintenance Automation Program (MAP), AOS-220 representing the Aeronautical Center, ACE-453 and ACE-458 representing the Central Region, ATR-120 representing Air Traffic; and representatives from Airway Facilities and Teledyne Controls were present for the integration testing.

NAS OT&E/Integration testing verifies whether the RVR RMS functions as an integrated component of the Remote Maintenance Monitoring System (RMMS), and ensures that NAS-SS-1000 (volumes I and V), NAS-MD-790, and system requirements are satisfied. The RVR RMS was originally tested in March of 1992 at MCI. The original testing identified 20 problems, of which 4 were critical. The first retest identified 28 new problems, and occurred during August of 1992. The second retest occurred in November of 1992 and identified 17 new problems. The third, and most recent retest was June of 1993. At the time of retest, there were 25 "OPEN" TTRs. Sixteen new problems were discovered, and 7 prior TTRs were closed. There were no critical problems found during this retest.

Of the 34 open problems for the RVR RMS Testing, there is 1 critical problem, 8 major problems, fifteen 15 minor problems, and 10 annoyances. Listed below are the critical and major problems:

Critical and Major Problems

- RVR failed to indicate battery condition alarm.
- No hard alarm capability for DPU power supplies.
- Scaling factors need to be clarified and reviewed.
- MPS failed to send commands unless RMS messages were received from RMS first. This was a frequent problem encountered during testing.
- MDT numerical read/write values have to be calculated.
- Alarm indicated on Threshold LUID instead of the Parameter LUID.
- Terminal messages are repeated although deleted.

- Unexpected RMS/Comm Alert messages when system is not active.
- RVR decoder did not identify alarm messages which were generated, but interpreted point condition as Inactive/Return to Normal.

A summary of all problems identified during OT&E/Integration testing are listed in attachment A. Test Trouble Reports (TTRs) describing the problems found during the June retest are presented in attachment B.

The critical and major TTRs will be discussed with the RVR Program Office and Maintenance Automation Program at a later date to be determined. All open TTRs will remain in that status until further action to close is taken.

ACN-100D feels that the outstanding problems would hinder system operation and recommends that the critical and major problems be corrected in a timely manner, and the minor problems and annoyances be subsequently fixed. These fixes can only be validated through an OT&E/Integration retest.

AOS REPORT FOR RETEST 3

U.S. Department of Transportation

Federal Aviation Administration

Subject: ACTION: Interim Operational Test & Evaluation Shakedown Test Report for the New Generation RVR (FA-10268)

Date: JUL 0 3

From: Manager, Environmental Support Engineering Branch, AOS-220

Reply to Attn. of:

To: Test Director, Weather Processors, ACW-200B

Additional shakedown testing on the Runway Visual Range (RVR) System, FA-10268, continued on June 14-18, 1993 supplementing the shakedown testing conducted December 1-4 and 8-11, 1992, September 1-4, 1992, and March 18-27, 1992 at the Kansas City International Airport.

Additional discrepancies/improvement issues that were observed during the March testing are as follows:

1. The PPU-B health light cycled on and off on the DPU. (Form Number 101)

2. On the VS/SIE parameter value screen the TX_LED_CUR and TX_TEMP had zero for the value when in hard alarm. (Form Number 102)

3. The FAA Facility Standard Drawings are not in final form. (Form Number 103)

4. The controllers users manual does not address failures on the RLIM. (Form Number 104)

In the interim shakedown report dated December 23, 1992 the RVR Discrepancy/Improvement Forms were listed by form number. The following is a list of our active discrepancy/improvement issues by form number: 1-4, 6, 11, 26, 29-32, 35, 36, 38-40, 42, 43, 46, 48, 50, 54, 59, 65, 80, 81, 85, 88, 93, 96, and 99. The attached forms have been expanded upon based on our latest shakedown efforts. The issues we are most concerned about are briefly discussed below.

RVR product system accuracy remains a major concern, especially in the IIIb and IIIc approach categories. It is our understanding that the system accuracy has not been verified/validated over the required RVR product range of 50 feet to 6500 feet. The DOT-TSC-FAA-92-77 evaluation summary does indicate acceptable calculated values in the IIIa, II, I, and non-precision approach categories.

Also of concern is the failure of the RVR system to perform during inclement weather especially during low RVR product conditions caused by blowing rain and snow. In addition to the Visibility Sensor (VS) off-line problems noted during shakedown activities, the Ambient Light Sensor caused the RVR to go off-line for several hours during rain and north winds on the morning of June 30, 1993.

The lack of effort on Teledyne's part to provide the Off-Site Technical Instruction book remains a problem for AOS in baselining the system and providing field support. As a deliverable under part of CLIN 4, none of the plans, schedules, and reschedules were met. The price of $17,166.28 for the Off-Site instruction book, CLIN 4a, seems drastically inadequate. Based on the difficulties experienced with Teledyne in obtaining an acceptable On-Site Technical Instruction book, we anticipate significant problems in obtaining an off-site book meeting the requirements of FAA-D-2494/b. We again request a revised manuscript plan so that we can determine Teledyne's status and schedule.

AOS has not received a response to the Component-Level and Special Tools & Test Equipment (STTE) training statement of work developed by the concerned organizations in June 1992. Please provide your response to the organizations so that appropriate planning and scheduling can be accomplished.

The Sensor Interface Electronics (SIE) enclosure's rust problems continue. Review of Teledyne's drawing 860504, approved in October 1989, indicates a requirement for NEMA 4X corrosion protected enclosures manufactured by Hoffman Engineering Co. or equivalent. The enclosures furnished by Teledyne do not meet this requirement. Significant enclosure maintenance may be required by the technicians.

Based on the review of the shakedown test results to date, we continue to recommend that the RVR system not be deployed. Appropriate resolutions of these issues should be completed before the shakedown effort is continued. We appreciate the opportunity to assist in the resolution of the OT&E issues.

for Harvey F. Hampton
David W. Fleming

Attachments

cc:
Official file

AAF-11
ACW-200B
ANN-140
ANN-200
FAA AFSFO Kansas City, MO
FAA QRO Wilbert Bentley
ASM-100
AOS-200
ACE-420

ACW REPORT FOR RETEST 3

INTERIM REPORT

NEW GENERATION RUNWAY VISUAL RANGE SYSTEM (RVR) OPERATIONAL TEST AND EVALUATION INTEGRATION REGRESSION TEST

SEPTEMBER 1993

Prepared By:

Weather/Primary Radar Division ACW-200B
Federal Aviation Administration Technical Center
Atlantic City International Airport
Atlantic City, NJ 08405

EXECUTIVE SUMMARY

This report details the initial results of the Runway Visual Range (RVR) Operational Test and Evaluation (OT&E) Regression Test. Testing was conducted from June 14, 1993 to June 25, 1993 at the Kansas City International Airport (KCI) in Kansas City, Missouri. Testing consisted of OT&E Integration, OT&E Operational and OT&E Shakedown. Tests were performed by ACN-100D, ACW-200 (Test Director) and AOS-220.

Operational problems noted herein have been detailed in Test Trouble Reports (TTRs) and Discrepancy Reports generated during OT&E Integration and Shakedown testing. A separate report on the results of OT&E Shakedown testing will be submitted by AOS-220. OT&E Integration TTRs are included as an attachment to this report.

Major operational problems noted during testing are as follows:

(1) The RVR system inhibited RVR products because of sensor shutdown on two separate occasions. Sensor shutdown was caused by rain hitting the lenses of the Visibility Sensor (VS) and the Ambient Light Sensor (ALS). Problems with sensor shutdowns have been documented in previous test reports. The software modifications intended to correct this problem were not successful.

(2) The RVR performance under Category IIIa/b conditions has never been properly validated (identified by AOS-220). ACW-200 is in agreement with this assessment.

OT&E Integration produced six TTRs related to the RVR RMS interface. These TTRs were classified as "Moderate" (see section 3.2 for TTR classifications). There were ten TTRs associated with the Interim Monitor and Control Software (IMCS) Decoder Module. Eight of these ten TTRs were classified as "Major".

As a result of the shutdowns, the lack of accuracy validation, and the probability of snow clogging (noted in previous tests conducted by Volpe Transportation Systems Center), ACW-200 continues to recommend against national deployment at this time.

1.0 PURPOSE.

The purpose of this report is to provide an interim summary of Runway Visual Range (RVR) Operational Test and Evaluation (OT&E) Regression Testing. Testing referenced in this report was conducted from June 14 1993 to June 25 1993, at the Kansas City International Airport (KCI) in Kansas City, MO.

2.0 SCOPE.

This report is based on test results that were evident immediately during testing or during post-test analysis. Any items that are not specifically related to the conducted tests, but could affect recommendation for deployment will be noted in the section entitled "RECOMMENDATIONS" (section 7.0).

Operational and Shakedown discrepancies are included in the AOS-220 Interim Operational Test & Evaluation Shakedown Test Report dated July 2, 1993.

OT&E Integration TTRs are included as an attachment to this report. This report is not intended, nor should it be used, as a substitute for the final test report.

3.0 BACKGROUND.

This was the third regression test conducted on the RVR system.

3.1 Software

In contrast to previous OT&E testing, the software used in this regression test was officially released by Teledyne and had undergone Factory Software Quality testing (SQT) prior to OT&E testing.

The version of software tested included changes made in response to Test Trouble Reports (TTR) and Discrepancy/Improvement Forms generated from previous OT&E testing. The software also included modifications to allow for an increase in the number of Visibility Sensor inputs from 12 to 18. This expansion is necessary to allow the system to be deployed at the new Denver International Airport (DIA).

3.2 ACW-200 Definitions for TTR Categories

For the purposes of this report, ACW-200 has defined the TTR classifications as described below. These classifications do not necessarily reflect the priority assigned to the TTR forms by ACN-100D.

"Major" - A deficiency that may by itself or in combination with other factors preclude a deployment recommendation.

"Moderate" - A deficiency that results in an increase in life cycle costs or provides unsatisfactory performance that can be worked around and perhaps eventually fixed but does not, of itself, prevent deployment.

"Minor" - A deficiency that results in undesirable performance that is an inconvenience but does not significantly affect mission effectiveness or life cycle costs.

4.0 TEST DESCRIPTION.

Testing consisted of a select set of procedures for OT&E Integration, OT&E Operational and OT&E Shakedown. Testing was conducted in accordance with FAA Order 1810.4B. The performing organizations were ACN-100D (Integration), AOS-220 (Shakedown) and ACW-200 (Operational/Test Director).

5.0 TEST RESULTS.

Integration

The breakdown of the integration Test Trouble Reports (TTRs) generated from the previous regression test was as follows:

Major	12
Moderate	16
Minor	6

Of the 34 TTRs which were classified as "open" in the OT&E Regression II test report (2/93), 14 of these were "closed" as a result of the Integration Regression test. Eight of the TTRs that were still classified as "open" are RVR related. The breakdown of these TTRs was as follows: 4 "Major" and 4 "Moderate". The remainder of the previously "open" TTRs were related to the Interim Monitor and Control Software (IMCS).

The Integration Regression test produced 16 new TTRs. Ten are associated with the IMCS Decoder Module and 6 are associated with the RVR RMS Interface. Of the 10 IMCS TTRs, eight are classified as "Major". All RMS TTRs were classified as "Moderate".

Operational

The following "Major" operational problems were noted during testing:

(1) System accuracy under Category IIIa/b conditions. **Note: Category IIIa/b accuracy and performance was not tested in Kansas City. However, an AOS-220 review of sensor accuracy test reports revealed Category IIIa/b validation had not been performed. Accuracy tests were performed by Volpe Transportation Systems Center.**

(2) Inclement weather such as rain caused the system to invalidate RVR products. The invalid RVR products were the result of sensor (VS, ALS) shutdowns.

Shakedown

Shakedown discrepancies are addressed in the Interim Operational Test & Evaluation Shakedown Test Report dated July 2, 1993.

6.0 CONCLUSION.

The RVR system continues to experience significant problems in the three areas tested (Operational, Shakedown, Integration). The primary areas of concern with relation to possible national deployment are: (1) system accuracy (Cat. IIIa/b), (2) performance under adverse weather conditions. Performance under the effects of weather include what appears to be a high probability of sensor snow clogging under relatively common blowing snow conditions.

7.0 RECOMMENDATIONS.

As noted in the Executive Summary, it is recommended that the system not be deployed nationally in its present state. Additional testing should take place to determine the effectiveness of enhancements designed to correct the major deficiencies. Specifically, category IIIa/b accuracy validation should be performed under simulated and actual weather conditions. Snow testing should also be performed with simulated and actual weather conditions to determine the probability and effects of clogging.

ACW-200 is aware of the urgent need to remedy the remaining major discrepancies with the RVR system. Every effort will be made to assist the Program Office and Teledyne Controls in correcting and testing the problems noted in this report.

APPENDIX D
RETEST 4
OT&E Operational, Integration, and Shakedown Reports

AOS REPORT FOR RETEST 4

ACTION: Operational Test & Evaluation Shakedown Report for the New Generation RVR (FA-10260), Denver Airport Configuration

Manager, Environmental Support
Engineering Branch, AOS-220

Test Director, Weather Processors, ACW-200B

Operational test and evaluation shakedown activities continued on the new generation Runway Visual Range (RVR) System, FA-10268, (Denver International Airport configuration) August 16-20, 1993, at the Kansas City International Airport. The Kansas City Airport retrofit package (see attachment) was installed by the Environmental Support Engineering Branch, AOS-220, on August 16 and 17.

Selected shakedown test procedures were accomplished on the new ambient light sensor on August 18 with satisfactory results. The new software, utilizing a precipitation detection period, hard-alarm delay periods, and signal variance precipitation detection, worked very well. Of minor concern is the erratic variation (small random jumps) of the contamination signal for no apparent reason.

Initial effects to calibrate the visibility sensors were unsuccessful. After several attempts, it appeared that the windows had to be extremely clean. The window contamination was erratic in large amounts (0 to 51) resulting in a constant precipitation mode. It was concluded that the sensor could be calibrated if enough attempts were made under the random conditions.

Two discrepancies were noted during testing. The first discrepancy was that the Visibility Sensor (VS) calibration plate did not fit properly on the fork of VS number 3. The second discrepancy was found in the technical instruction book, pages 9-68 and 9-69, on figures 9-40 and 9-41 respectively. Some of the gain values are inconsistent with the default settings of the software.

The new sensor heads did not have spider tape installed. It was noted that after two days, numerous spiders were ready to set up housekeeping on the windows. Spray, paint, or tape will be required.

OT&E Shakedown testing will continue after the software has been requalified and the sensor heads have been reworked.

ORIG GNED BY
DAVID ... FLEMING

David W. Fleming

Attachment

cc:
Official File

AAF-11	ANN-200	FAA AFSFO Kansas City, MO
ACW-200B	ASM-100	FAA QRO, Wilbert Bentley
ANN-600	AOS-200	ACE-420
ANS-400		

AOS-220:HSanayi:cln:9/1/93 (wp:Sanayi\RVRQUICK.RPT)

APPENDIX E
RETEST 5
OT&E, Operational, Integration, and Shakedown Reports

AOS REPORT FOR RETEST 5

U.S. Department of Transportation
Federal Aviation Administration

Memorandum

Subject: ACTION: Operational Test & Evaluation Shakedown Report for the New Generation RVR (FA-10268), Denver Airport Configuration

Date: OCT 12 1993

From: Manager, Environmental Support Engineering Branch, AOS-220

Reply to Attn of:

To: Test Director, Weather Processors, ACW-200B

Operational test and evaluation (OT&E) shakedown activities continued on the new generation Runway Visual Range (RVR) System, FA-10268, (Denver International Airport configuration) September 20-24, 1993, at the Kansas City International Airport. Updated EPROMs were installed for the Maintenance Processing Unit (MPU) and four Visibility Sensors (VS).

The software versions used at Kansas City, Missouri, and Mt. Washington, New Hampshire, were:

Kansas City		Mt. Washington	
MPU	2.7	MPU	2.6
PPU	2.4	PPU	2.4
VS	2.6	VS	2.5
ALS	2.4	ALS	2.5
RLIM	2.3	RLIM	2.3

The software for these two tests was supposed to be the same, but were not.

During the morning of September 23, 1993, 3 of the 4 VS went off-line due to rain. The weather service reported up to 6 knot winds at 10 degrees with approximately 0.7 inches of rain in a 4 hour period. See attachment. We performed spray testing on the VS's and found that the receiver window continues to be more sensitive than the transmitter window. When the receiver was sprayed the VS sensor went off-line in approximately 6 seconds. During the previous afternoon the VS's were oscillating off and on for some unknown reason.

During the calibration verification of the VS's it was noted that the high side of the calibration plate would not meet the 5% tolerance required by the Technical Instruction book.

The spider paint provided by the Navigational & Visual Systems Engineering Division, ANN-600, was tested on all VS's and the

Ambient Light Sensor (ALS). It did not kill or prevent spiders and it washed off in the rain. A more effective spider insecticide will be required.

The onsite Technical Instruction book, TI 6560.17, had some errors not corrected from the last review of the book.

During the requalification testing at Teledyne September 13-17, 1993, a problem was observed with the ALS. When the ALS was placed in sunlight the DPU showed a false window contamination value. Teledyne was unable to correct this problem before shakedown testing; thus, this issue is still to be resolved.

OT&E Shakedown testing will continue after the ALS software has been requalified, the VS off-line conditions have been addressed, more effective insecticide for spiders has been obtained, and the calibration plate high value has been changed to agree with the software.

David W. Fleming

Attachments

		09		60+			0	0	
266	1250	19R	01L	FFF	60+	60+	2	2	00095
		09		60+			0	0	
266	1251	19R	01L	FFF	60+	60+	2	2	00091
		09		60+			0	0	
266	1252	19R	01L	FFF	60+	60+	2	2	00091
		09		60+			0	0	
266	1253	19R	01L	FFF	60+	60+	2	2	00091
		09		60+			0	0	
266	1254	19R	01L	FFF	60+	60+	2	2	00093
		09		60+			0	0	
266	1255	19R	01L	FFF	60+	60+	2	2	00097
		09		60+			0	0	
266	1256	19R	01L	FFF	60+	60+	2	2	00097
		09		60+			0	0	
266	1257	19R	01L	FFF	60+	60+	2	2	00097
		09		60+			0	0	
266	1258	19R	01L	60+	60+	60+	2	2	00097
		09		60+			0	0	
266	1259	19R	01L	60+	60+	60+	2	2	00096
		09		60+			0	0	
266	1300	19R	01L	60+	60+	60+	2	2	00094
		09		60+			0	0	
266	1301	19R	01L	60+	60+	60+	2	2	00096

Entry Date	Entry Time	Site	Type	Point No/LUID	Point Value	Point Description	Point Condition
09/23/93	02:18:52	SPG	RVR	3B2A	Normal	Link Cmplt Status	Status
09/23/93	02:18:52	SPG	RVR	3B2A	Hard alarm,high	Link Cmplt Status	Unacknowledged Alarm
09/23/93	04:31:33	SPG	RVR	3C2A	Hard alarm,high	Link Cmplt Status	Unacknowledged Alarm
09/23/93	04:31:33	SPG	RVR	3C2A	Normal	Link Cmplt Status	Status
09/23/93	05:38:25	SPG	RVR	3C2A	Hard alarm,high	Link Cmplt Status	Unacknowledged Alarm
09/23/93	05:38:25	SPG	RVR	3C2A	Normal	Link Cmplt Status	Status
09/23/93	05:39:40	SPG	RVR	3B2A	Normal	Link Cmplt Status	Status
09/23/93	05:39:40	SPG	RVR	3B2A	Hard alarm,high	Link Cmplt Status	Unacknowledged Alarm
09/23/93	06:46:35	SPG	RVR	3B2A	Hard alarm,high	Link Cmplt Status	Unacknowledged Alarm
09/23/93	06:46:37	SPG	RVR	3B2A	Normal	Link Cmplt Status	Status
09/23/93	07:38:28	SPG	RVR	2920	Offline by Auto	Control Status	Status
09/23/93	07:38:28	SPG	RVR	2922	SIE_ENCL_LRU	LRU Sta(1st likely	Status
09/23/93	07:39:19	SPG	RVR	2922	No Failure	LRU Sta(1st likely	Status
09/23/93	07:39:19	SPG	RVR	2920	Online Auto	Control Status	Status
09/23/93	08:48:43	SPG	RVR	293C	10.5	VS RX Wind Contam	Status
09/23/93	08:51:28	SPG	RVR	2B3C	15.5	VS RX Wind Contam	Unacknowledged Warning
09/23/93	08:51:34	SPG	RVR	2A3C	13.0	VS RX Wind Contam	Unacknowledged Warning
09/23/93	08:51:47	SPG	RVR	2B3C	21.0	VS RX Wind Contam	Status
09/23/93	08:51:52	SPG	RVR	2A3C	12.0	VS RX Wind Contam	Status
09/23/93	08:57:25	SPG	RVR	283C	20.0	VS RX Wind Contam	Unacknowledged Warning
09/23/93	08:57:31	SPG	RVR	283C	21.0	VS RX Wind Contam	Status
09/23/93	09:01:03	SPG	RVR	293C	22.5	VS RX Wind Contam	Unacknowledged Warning
09/23/93	09:02:05	SPG	RVR	293C	21.5	VS RX Wind Contam	Unacknowledged Alarm
09/23/93	09:02:09	SPG	RVR	2922	VS_RXHD_LRU	LRU Sta(1st likely	Status
09/23/93	09:02:11	SPG	RVR	2920	Offline by Auto	Control Status	Status
09/23/93	09:02:41	SPG	RVR	293C	12.5	VS RX Wind Contam	Status
09/23/93	09:02:42	SPG	RVR	2920	Online Auto	Control Status	Status
09/23/93	09:02:46	SPG	RVR	2922	No Failure	LRU Sta(1st likely	Status
09/23/93	09:04:50	SPG	RVR	2822	SIE_ENCL_LRU	LRU sta(1st likely	Status
09/23/93	09:04:50	SPG	RVR	2822	No Failure	LRU sta(1st likely	Status
09/23/93	09:04:50	SPG	RVR	2820	Offline by Auto	Control Status	Status
09/23/93	09:04:50	SPG	RVR	2820	Online Auto	Control Status	Status
09/23/93	09:07:47	SPG	RVR	2848	Hard alarm,high	VS RX Sensors	Unacknowledged Alarm
09/23/93	09:07:50	SPG	RVR	2844	Hard alarm,high	VS Sensor Failure	Unacknowledged Alarm
09/23/93	09:07:52	SPG	RVR	2822	VS_RXHD_LRU	LRU sta(1st likely	Status
09/23/93	09:07:52	SPG	RVR	2823	VS_SIE_PM_LRU	LRU sta(2nd likely	Status
09/23/93	09:07:52	SPG	RVR	2824	VS_TXHD_LRU	LRU sta(3rd likely	Status
09/23/93	09:07:54	SPG	RVR	2820	Offline by Auto	Control Status	Status
09/23/93	09:08:01	SPG	RVR	2824	SIE_CTRL_LRU	LRU sta(3rd likely	Status
09/23/93	09:08:01	SPG	RVR	2825	VS_TXHD_LRU	LRU sta(4th likely	Status
09/23/93	09:10:13	SPG	RVR	2848	Normal	VS RX Sensors	Status
09/23/93	09:10:13	SPG	RVR	2825	No Failure	LRU sta(4th likely	Status
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	SIE_ENCL_LRU	LRU sta(1st likely	Status

ACN REPORT FOR RETEST 5

TO: Darren Fields

FROM: Ray Haines

DATE: November 18, 1993

SUBJECT: Revised Final Quick Look results for RVR Re-Testing September 21-23, 1993

Attached you will find the revised test results for the RVR re-test which was performed from September 21 through 23, 1993. This memo incorporates comments made by your in our discussion on November 15, 1993.

I will contact you to arrange a discussion at a mutually convenient time. Should you require any additional information or would like to discuss the comments earlier, please call me at (609) 645-5069.

Attachments: 4

cc: P. Friel
K. Wideman
RVR Files

ATTACHMENT #1

This document describes the results of retesting the Test Trouble Reports (TTRs) for the Runway Visual Range (RVR) System. The TTRs were created as a result of previous National Airspace System (NAS) Operational Test and Evaluation (OT&E) Integration Testing of the RVR Remote Monitoring Subsystem (RMS). The Maintenance Automation Program Division (ANA-120) requested that ACN-100D perform the re-test to determine the status of corrections made to the RVR RMS Decoder Module for IMCS.

Re-testing occurred on September 22 and 23, 1993 at the Kansas City International Airport in Kansas City, Missouri. A dial-up was used for executing the Interim Monitor and Control Software (IMCS) which resided at the Kansas City Air Route Traffic Control Center (ARTCC) in Olathe, Kansas. IMCS (unknown version) executed in an independent pathway. All previously reported TTRs which were still open were re-tested.

Results of TTR's identified as an IMCS problem are included in Attachment #2. TTR's identified as an RMS problem are included in Attachment #3.

Participants.

Test Personnel:

Greta Daczkowski	ACN-100D/CTA
Darren Fields	ACN-100D
Ray Haines	ACN-100D/CTA

Support Personnel:

Dave Gregoire	MCI AFSFO - RVR Technician
Charles Blue	ZKC AF61E - MPS Support
Leonard Buehler	ZKC AF61B - MPS Support

Test Equipment.

LM-1 Protocol Analyzer executing on a Compaq 286 portable Computer
MPS Simulator executing on a Compaq 286 portable computer
MDT Laptop Computer - Compaq SLT 386 Computer executing PCT terminal emulation software to access MPS.
Miscellaneous cables and adapters.

Test Objectives.

The objective of the retest was to verify that corrections to the RVR IMCS decoder software had been implemented and that previously reported decoder problems had been corrected. Additionally, the retest was to determine the status of all problems.

Test Categories.

There were not any test categories for this retest. Each TTR was examined, recreation of the problem was attempted, and data was captured.

Data Collection and Analysis Method.

During the retest, data was captured in an IMCS Database History File, in LM1 protocol analyzer buffer files, and in terminal emulation capture files at the MDT. Data for the test of each TTR was identified in each file and analyzed to determine a status.

Test Results.

During the September 22-23 retest, 13 RVR IMCS decoder and 3 RVR RMS TTRs were closed. Three new IMCS TTRs were opened. There are 12 RVR RMS and 9 RVR IMCS decoder TTRs (21 total) which remain open. The remaining open RVR RMS TTRs include one critical, 3 major, 5 minor, and 3 annoyance TTRs. The remaining open RVR IMCS decoder TTRs include 2 major, 2 minor, 4 annoyance, and 1 other TTRs.

Conclusions.

Critical and major problems still exist with the RVR system. Resolution of the NAS requirement for certification has not been resolved. Nor has there been any memorandum or waiver to relieve the requirement. Other problems required responses or actions which have not been completed. ACN-100D recommends that a meeting or teleconference be arranged to discuss the completion of these items. ACN-100D also recommends that retesting be considered for any future system changes which could impact the RMS capability.

Attachment #2

Status of remaining IMCS (RVR Decoder) Test Trouble Reports

(An "*" next to the Status indicates that the TTR was reported as "Needs Analysis" in the preliminary Quick Look of September 27, 1993).

TTR #	System	Description of Problem	Priority	Status
019	IMCS	RVR IMCS Decoder does not provide Certification Status screen	III	Open
023	IMCS	IMCS command parameter values not in expected units (Priority modified from Major 09/22/93)	IV	Open
032	IMCS	MPS failed to send commands unless RMS message was received from RMS first	II	Closed *
034	IMCS	IMCS History Report not consistent in position of LU when printing LUID	IV	Closed *
035	IMCS	The command error response should be included in IMCS History Report	IV	Open *
036	IMCS	The Point No field of the IMCS User History Report should identify the data point for Equipment Control Commands	IV	Closed *
039	IMCS	IMCS History Report indicates "Normal" when RTN is received. These are not equivalent indications	III	Open *
061	IMCS	MPS double RRs	IV	Open
063	IMCS	MPS polls while RMS is sending data	IV	Open *
067	IMCS	Wrong description is used for De-Ice Heater	III	Closed
071	IMCS	Data point description incorrect LU27 DPs 31, 32, 33, 34	III	Closed
072	IMCS	Alarm indicated on wrong LUID	II	Closed *
073	IMCS	VS sensor failure & VS SIE fail stat not clear cons monit	III	Closed *

Attachment #2

Status of remaining IMCS (RVR Decoder) Test Trouble Reports (Continued)

075	IMCS	LU 48 current sensor X has wrong point value	III	Closed
077	IMCS	Character remains on constant monitor	IV	Closed
078	IMCS	Terminal messages are repeated	II	Closed
079	IMCS	IMCS point description should be consistent	IV	Closed
080	IMCS	Unexpected RMS/Comm Alert message	II	Closed *
081	IMCS	RVR decoder incorrectly identifies alarm messages	II	Closed *

The following are new TTRs created after the September 21-23 Retest:

082	IMCS	Decoder does not decode some soft alarms	II	Open (new)
083	IMCS	Messages are not in History file as they were sent	IV	Open (new)
084	IMCS	Soft Alarm decoded as wrong data point	II	Open (new)

Attachment #3

Status of remaining RVR RMS Test Trouble Reports

(An "*" next to the Status indicates that the TTR was reported as "Needs Analysis" in the preliminary Quick Look of September 27, 1993).

008	RMS	RVR failed to indicate a battery condition alarm	I	Open
018	RMS	Remote Certification Parameters have not been identified	III	Open
025	RMS	No hard alarm capability	II	Open
029	RMS	General comment on scaling factors	II	Open
033	RMS	Command Error messages are incomplete because they didn't include entire command message	III	Closed
052	RMS	MDT numerical read/write values	II	Open
054	RMS	MDT input procedure	IV	Open
057	RMS	Clarify purpose of LU 23	III	Open
062	RMS	RMS data stops and restarts	IV	Closed *
066	RMS	RMS response to DISC while already in DM is UA vs DM	III	Open
068	RMS	Command error message for some commands is incorrect	III	Open
069	RMS	RMS incorrectly prioritizes first message	III	Closed *
070	RMS	Erroneous character at MDT while editing (Priority modified from Major 09/22/93)	IV	Open
074	RMS	RMS Resets itself with any command under conditions	III	Open *
076	RMS	Mismatch between the MPS and MDT fault LRU screens	IV	Open *

Attachment #4
ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 082-R04
TTR TITLE: Decoder does not decode some soft alarms	TTR PRIORITY: II MAJOR
ORIGINATOR: Ray Haines	OBSERVED: 09/22/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement

REFERENCE: ICD (June 7, 1993)
REV/VOL G PAGE -- PARA --

TEST SEQUENCE: ID CAT A3 STEP 23 PAGE 108

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The decoder failed to decode some soft alarm messages. The messages were sent to the OSP terminal with indication that there was a mismatch between the condition status code (CSC) (32 bit) and the monitored value (16 bit). This indication was incorrect because the data point had a 16 bit CSC and a 16 bit value. This occured for the following data points:

LUID	Description
283C	VS_RX_Wind_Contam
293C	VS_RX_Wind_Contam
2A3C	VS_RX_Wind_Contam
252A	DPU Plus 5V
2533	DPU Minus 12V

(originally part of TTR 072)

FOLLOW-UP STATUS: DATE
_____ __ /__ /__
_____ __ /__ /__

CLOSURE DESCRIPTION:
_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

Attachment #4
ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 083-R04
TTR TITLE: Messages are not in History file as the were sent	TTR PRIORITY: V OTHER
ORIGINATOR: Ray Haines	OBSERVED: 09/22/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: ICD (June 7, 1993) REV/VOL G PAGE -- PARA --	
TEST SEQUENCE: ID CAT A3 STEP Misc PAGE --	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:
The order of the messages in the History file were not as they were sent from the RMS. The LM-1 Protocol Analyzer showed messages in a different order than the History file. This occured only when the RMS responded with multiple I-frame messages for a single poll cycle. The LM-1 messages were identified with a sequence (1,2,3, and etc) and the following corresponding sequences were noticed,

Seq at LM-1	Seq in History File
1,2	2,1
1,2,3	2,3,1
1,2,3,4	1,2,4,3
1,2,3,4,5	1,2,4,3,5

Note: Current analysis indicates that the Database Current Status file is updated with the latest message regardless of the order in the History file.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

2

Attachment #4
ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 084-R04
TTR TITLE: Soft Alarm decoded as wrong data point	TTR PRIORITY: II MAJOR
ORIGINATOR: Ray Haines	OBSERVED: 09/22/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: ICD (June 7, 1993) REV/VOL G PAGE -- PARA --	
TEST SEQUENCE: ID CAT A3 STEP 21 PAGE 107	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A Soft Alarm message for LUID 2839 (VS TX Wind Contam) was decoded as a soft alarm for the previous data point. In the first case it was decoded as LUID 2844 (VS Sensor Failure) and in the second case it was decoded as LUID 2834 (VS Battery Condition).

(originally part of TTR 072)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

APPENDIX F
RETEST 6
OT&E Operational, Integration, and Shakedown Reports

ACW REPORT FOR RETEST 6

INTERIM TEST REPORT

for the

"DENVER CONFIGURATION"
RUNWAY VISUAL RANGE SYSTEM (RVR)
OPERATIONAL TEST & EVALUATION/INTEGRATION REGRESSION TEST

DECEMBER 1993

Prepared by:

Weather/Primary Radar Division ACW-200B
Federal Aviation Administration Technical Center
Atlantic City International Airport
Atlantic City, NJ 08405

EXECUTIVE SUMMARY

This report details the initial results of the "Denver Configuration" Runway Visual Range (RVR) Operational Test and Evaluation (OT&E) Regression Test. Testing was conducted from December 6, 1993 to December 10, 1993 at the Kansas City International Airport (MCI) in Kansas City, Missouri. Testing consisted of OT&E Integration, Operational and Shakedown. Tests were performed by representatives from ACN-100D, ACW-200 (Test Director) and AOS-220.

Problems noted during testing have been detailed in Test Trouble Reports (TTRs) or Discrepancy Reports generated by ACN-100D or AOS-220 respectively. A separate report on the results of OT&E Shakedown testing will be submitted by AOS-220.

This round of OT&E testing was intended to qualify an interim version of software for operation at the New Denver Airport. Conducted tests were aimed primarily at verifying fixes to previously identified problems. Specifically, those fixes intended to improve operational reliability were confirmed. Overall functionality of the system was also verified.

Significant discrepancies discovered or verified as still existing include:

(1) Hard alarms are not always reported by the Remote Maintenance Subsystem (RMS) interface.

(2) The Sensor Interface Electronics (SIE) cannot be reset on battery power.

(3) The gain value for Ambient Light Sensor (ALS) needs evaluation and adjustment.

(4) The "Look-Down" Visibility Sensors (VS) shut down when precipitation exists with sunlight.

(5) The operational theory and optimal limit settings of the contamination compensation algorithms is unclear at this time. These algorithms have been changed numerous times in attempts to correct sensor shut-down problems. The effects of contamination compensation under both static and dynamic conditions must be documented and validated.

(6) The battery monitoring capabilities of the SIE are insufficient.

As stated above, the intent of the retest was to qualify an interim version of RVR software for deployment at the New Denver Airport. ACW-200 has agreed to the interim qualification because no present generation RVR systems are available for installation at New Denver.

At present, the New Generation RVR is not considered ready for general deployment. The interim software version tested is considered to be minimally operational; therefore, ACW-200 recommends deployment of th RVR with this version of software to the Denver site only. Additiona testing and data collection in the areas of severe weather performance and system accuracy must be accomplished before consideration can be given to deployment at any additional sites.

1.0 PURPOSE.

The purpose of this report is to provide the results of the "Denver Configuration" Runway Visual Range (RVR) Operational Test and Evaluation (OT&E) Regression Test. Testing referenced in this report was conducted from December 6, 1993 to December 10, 1993 at the Kansas City International Airport (MCI) in Kansas City, Missouri.

2.0 SCOPE.

This report is based on test results that were evident immediately during testing or during post-test analysis. Any items that are not specifically related to the conducted tests, but could affect recommendation for deployment will be noted in the section entitled "RECOMMENDATIONS" (section 7.0).

Operational and Shakedown discrepancies are included in the AOS-220 Interim Operational Test & Evaluation Shakedown Test Report. This report is not intended, nor should it be used as a substitute for the final test report. Findings and recommendations herein apply only to those released versions of software listed in Section 3.

3.0 BACKGROUND.

This was the fifth regression test conducted on the RVR system. In addition to the new release of the RVR software, a new release of the Interim Monitor and Control (IMCS) decoder module was installed on the Maintenance Processor Subsystem (MPS). The production release software version numbers for the RVR SIEs were as follows:

Maintenance Processing Unit	(MPU)	1025936030
Product Processing Unit A	(PPU A)	1117935031
Product Processing Unit B	(PPU B)	1117935031
Visibility Sensor 01	("LKDNW" 01)	1202932031
Visibility Sensor 02	("LKDWN" 02)	1202932031
Visibility Sensor 03	("LKDWN" 03)	1202932031
Visibility Sensor 04	("LKDWN" 04)	1202932031
Ambient Lighting Sensor	(ALS)	1028993030
Runway Light Intensity Monitor	(RLIM)	1106924023

This was the first OT&E test of the RVR since changing Visibility Sensors (VS) to a "Look-Down" orientation. The look-down VS orients the receiver and transmitter in a downward-looking direction. This, in conjunction with a longer and more conformal hood, helps to prevent lens contamination during precipitation. These changes were made in an effort to eliminate sensor shutdowns caused by high lens contamination levels and to minimize the possibility of snow clogging. Snow clogging in a

system using forward scatter technology can result in an RVR product which is significantly higher than actual.

Other system changes included a new Electromagnetic Interference (EMI) assembly, modifications to the contamination compensation algorithms, and an enhanced personality card in all of the SIE's.

4.0 TEST DESCRIPTION.

Testing consisted of OT&E Integration, OT&E Operational and OT&E Shakedown as defined in FAA Order 1810.4B. Procedures were a subset of those employed in the initial OT&E Testing of the New Generation RVR system. The performing organizations were ACN-100D (Integration), AOS-220 (Shakedown) and ACW-200 (Operational/Test Director).

5.0 TEST RESULTS.

Integration

Integration testing of the RVR is almost exclusively related to the Remote Maintenance Subsystem (RMS) interface. The latest modifications to the RVR software were not directly related to this interface; however, it was felt regression testing should be performed as a quality assurance measure prior to deployment of the system at Denver. In addition, the retest presented the opportunity to verify the latest engineering release of the IMCS decoder software. One significant new discrepancy was discovered. The problem involves hard alarms not always being reported by the RMS when an "off-line" (or failure) condition occurs with the Visibility Sensors. It is believed this is related to a previously documented problem with incorrect responses from the RMS interface. Post test analysis indicates the RMS interface may be shutting down if it experiences periods of inactivity longer than 10 to 15 minutes. The interface will continue its normal health checks with the MPS, but will fail to initiate or respond to data exchanges. A Test Trouble Report (TTR) was generated outlining the discrepancy. It was also noted during test that unique data points need to be included in the RMS interface for the SIE temperature and for the VS and ALS window contamination alarm delay periods.

Integration test resulted in the closing of two previous RMS related TTR's. There were no problems reported for the IMCS decoder module. Test results are currently under review by ACN-100D to determine the status of all existing TTRs.

Operational & Shakedown

The following problems were observed and are considered open at this time:

(1) The Sensor Interface Electronics (SIE) cannot be reset while on battery power. AC power must be available to reset the SIE's.

(2) The gain value for Ambient Light Sensor (ALS) contamination sensor appears to be too high. Precipitation on the ALS lens caused an increase in the ambient light reading. In addition, increased sensitivity of the contamination sensor could result in outages of the entire system during blowing rain conditions.

(3) The Visibility Sensors (VS) will go "off-line" with a combination of precipitation and sunlight.

(4) The battery monitoring capabilities of the SIE are insufficient. System enhancements should be provided to permit proper monitoring of the SIE batteries.

(6) The Runway Light Intensity Monitors (RLIM) experienced intermittent failures. The cause of these failures is presently unknown. A hardware failure not related to software changes is suspected.

6.0 CONCLUSION.

The "Denver Configuration" of the RVR system appears to be adequate for limited deployment (Denver only). There are still significant areas of concern that will require research and, possibly, additional testing.

The primary areas of concern are: (1) the ability of the system to maintain accuracy and operational status under all weather and visibility conditions, and (2) proper operation of the RMS interface regardless of frequency of data exchanges. In addition, numerous support and documentation discrepancies presently exist.

7.0 RECOMMENDATIONS.

As noted in the Executive Summary, it is recommended that the system be conditionally deployed at Denver only. Remaining problems should be resolved in a timely fashion. Analysis and, if warranted, additional testing should be performed to validate system performance under all conditions.

Specifically, the following areas should be addressed before OT&E testing of a National Deployment configuration:

1. Additional Category IIIa/b accuracy validation should be performed under both actual operational conditions, and scientifically controlled laboratory conditions.

2. Existing data concerning snow performance and clogging probability should be carefully reviewed. If necessary, additional snow testing should be performed with both simulated and actual weather conditions to determine the probability and effects of clogging.

3. System performance during daylight precipitation should be investigated.

4. RMS interface operation should be verified under all data flow conditions.

ACW-200 is aware of the urgent need to remedy the remaining major discrepancies with the RVR system. Every effort will be made to assist the Program Office in correcting and testing the problems noted in this report.

ACN REPORT FOR RETEST 6

DOT/FAA/CT-TN94/XXX

National Airspace System (NAS) Operational Test and Evaluation (OT&E) Integration Retest of the Runway Visual Range (RVR) System Remote Monitoring Subsystem (RMS)

DRAFT

QUICK LOOK REPORT
For Retest of December 6-10, 1993
and Other Retests since June 1993

JANUARY 1994

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

U.S. Department of Transportation
Engineering, Test, and Evaluation Service
ATC Sustaining Engineering Division
Maintenance Automation Program
FAA Technical Center
Atlantic City International Airport, N.J. 08405

1. INTRODUCTION.

This document describes the results of retesting the Test Trouble Reports (TTRs) for the Runway Visual Range (RVR) System. The TTRs were created as a result of previous National Airspace System (NAS) Operational Test and Evaluation (OT&E) Integration Testing of the RVR Remote Monitoring Subsystem (RMS). The Maintenance Automation Program Division (ANA-700) requested that ACN-100D perform the retest to determine the status of corrections made to the RVR RMS Decoder Module for Interim Monitor and Control Software (IMCS).

TTRs identified as an open problems are found in Appendix A. TTRs identified as an closed problems are found separately in Appendix B.

1.1 TEST SCHEDULE AND LOCATION.

A complete NAS OT&E Integration Test was performed June 14 through 25, 1993. A subsequent Test Report Summary was delivered in August 1993 for the complete test. The June 1993 test identified several problems which were deemed correctable. Retesting of the RVR RMS and the IMCS decoder module for RVR was requested by the RVR program office (ANN-140) and the MAP office (ANA-700) after the corrections were incorporated. Retesting occurred on September 22 and 23, 1993 and also on December 6 through 10, 1993 at the Kansas City International Airport in Kansas City, Missouri. A dial-up was used for accessing the IMCS on the Maintenance Processor Subsystem (MPS) which resided at the Kansas City Air Route Traffic Control Center (ARTCC) in Olathe, Kansas. IMCS (unknown version, perhaps modified R08.04) executed in an independent pathway. All previously reported TTRs which were still open were retested.

1.2 PARTICIPANTS.

Test Personnel:	
Darren Fields	ACN-100D
Ray Haines	ACN-100D/CTA INCORPORATED
Support Personnel:	
Dave Gregoire	MCI AFSFO - RVR Technician
Charles Blue	ZKC AF61E - MPS Support
Leonard Buehler	ZKC AF61B - MPS Support
RVR Decoder Installation and Support:	
Tom Tran	VOLPE/Unisys
Bill Pamer	ANA-120

1.3 TEST EQUIPMENT.

LM-1 Protocol Analyzer executing on a Compaq 286 portable computer.
Enhanced MPS Simulator executing on a Compaq 286 portable computer.
MDT Laptop Computer - Compaq SLT 386 computer executing PCT terminal emulation software to access MPS.
Miscellaneous cables and adapters.

2.0 TEST AND EVALUATION DESCRIPTION.

2.1 TEST OBJECTIVES.

The objective of the retest was to verify that corrections to the RVR IMCS decoder software had been implemented. Additionally, the retest was to determine the status of all problems.

2.2 TEST CATEGORIES.

There were not any test categories for these retests. Each open TTR was examined, recreation of the problem was attempted, and data was captured. When possible, steps used to recreate the problem were extracted from the existing test procedures.

2.3 DATA COLLECTION AND ANALYSIS METHOD.

During the retest, data was captured in an IMCS Database History File, in LM1 protocol analyzer buffer files, and in terminal emulation capture files at the MDT. Data for the test of each TTR was identified in each file and analyzed to determine a status.

3.0 TEST RESULTS.

During the September 22-23 retest, 12 RVR IMCS decoder and 3 RVR RMS TTRs were closed. During the December 06-10 retest, 5 IMCS decoder and 0 RVR RMS TTRs were closed. Two (2) new RVR RMS TTRs and no new IMCS TTRs were opened. There are 15 RVR RMS and one IMCS decoder TTR (16 total) which remain open. The remaining open RVR RMS TTRs include no (0) "critical' 4 "major", 6 "minor", 5 "annoyance", and 1 "other" TTRs. The one remaining open RVR IMCS decoder TTR is minor in Priority.

3.1 RVR SYSTEM MODIFICATIONS AFTER JUNE 1993 RETEST.

Several modifications were made to the RVR system since the complete retest was performed in June 1993.

a. Software for the Maintenance Processing Unit (MPU), Product Processing Unit (PPU), Visibility Sensor (VS), and Ambient Light Sensor (ALS) was modified after the June 1993 retest. The firmware (EPROMS) for these units was replaced with each change. The version numbers were displayed at a Maintenance Data Terminal (MDT) connected to the Data Processing Unit (DPU). The version numbers displayed are listed below.

Subsystem	S/W Version
MPU	1025936030
PPU A	1117935031
PPU B	1117935031
VS SIE 01	1202932031
VS SIE 02	1202932031
VS SIE 03	1202932031

VS SIE 04	1202932031
VS SIE 05-18	None
ALS SIE	1028933030
RLIM SIE 01	1106924023
RLIM SIE 02	1106924023
RLIM SIE 03-12	None

b. At the conclusion of the December 1993 test, the firmware for the VS SIE and ALS SIE was changed. The new version was received too late to be retested by ACN-100D. The program office installed the changes in the ALS SIE and VS SIE 01. The change was made to correct a problem with the sensor going off line due to the De-ice heater remaining on when the AC power was off. By keeping the De-ice heater off, no alarm will be generated for the De-ice heater and the sensors will remain on line. The program office tested the change. The new version for the VS SIE was 3.2 and the new version for the ALS SIE was 3.1. The date code for both VS and ALS SIEs was 12/09/93.

c. An alarm delay period was added after the June 1993 retest and prior to the September 21-23 retest. This delay period is accessible from an MDT connected to the DPU. The value of this delay period was blamed for causing Visibility Sensor SIEs to go off line in rainstorms during and after the September retest. When ACN-100D was questioned to help determine the value of the Alarm delay period after the September retest, the IMCS Database History report was examined for this information. The result was that no monitoring capability was added for the MPS. Normally all system parameters and operation modes are monitored and available to the MPS. As a practice, ACN-100D, performs a Global Poll for system status at the close of each test. When the data was examined, no data points were found at the MPS for the alarm delay period. Although the RVR system had been modified for this new parameter, no associated Interface Design Document (IDD) change had been made to provide the information to the MPS.

The alarm delay period causes the RVR to wait the number of delay periods entered before issuing a window contamination alarm. At the September retest, the parameter values for the alarm delay period were adjustable from zero through 255 delay periods. At the December retest, the parameter values for the alarm delay period were changed to a minimum of three through 255 delay periods. During the December 1993 retest, window contamination alarms were observed as AOS-220 attempted to test the affect of this new parameter. Each alarm delay period is defined by the RVR On-site Users Manual (TI 6560.17) as about three minutes. When attempting window contamination alarms, the alarms were delayed beyond the expected delay time established by the alarm delay period. With the alarm delay period set at its minimum value (3), the delay period of 3 delays totals 9 minutes. Before the alarm is issued it must remain in an alarm condition for an additional delay period. The additional delay occurs prior to the first delay period counted. In this delay period the window contamination must remain constant. The sensor is normally in dirt mode but switches to precipitation mode when any contamination is detected.

If the window contamination does not remain constant, the sensor stays in precipitation mode and no window contamination alarms are issued. If window contamination remains constant, the sensor returns to dirt mode and will issue an alarm after the alarm delay period. The total actual alarm delay time was closer to 12 minutes for the window contamination alarm.

d. Additional sensor modes were added since the June 1993 retest. The new modes (Dirt and Precipitation modes) are used to determine the algorithms used for measuring Visibility and Ambient Light and for determining alarms/alerts. The new modes are affected by the Alarm Delay Period. The new modes are identified in data available at the Engineering Data Port but are not available to an MDT connected to the DPU or the MPS. Another sensor mode is the Snow mode. This parameter is also not available at the DPU or the MPS.

e. A possible problem exists in determining a window contamination alarm when the sensor enters precipitation mode. To go into alarm the window contamination value has to be constant to within some value (2 1/4 units?). When attempting contamination alarms (during the December 1993 retest), it was noticed that the contamination value varied by more than the value (2 1/4 units?). This variation causes the sensor to remain in precipitation mode. If the contamination value remains within the value (2 1/4 units?) and is greater than the soft alarm threshold value, a soft alarm will be issued. If the value varies by more than the value (2 1/4 units?), the sensor remains in precipitation mode. When in precipitation mode, no soft alarm is ever issued. To go into hard alarm, when in precipitation mode, the value must be greater than the hard alarm threshold (150 units). If the sensor remains in dirt mode, soft and hard alarms are issued per the threshold values as expected. The time required to issue an alarm in dirt mode is one alarm delay period which is 3 delays (@ 3 minutes each) plus the first delay period (@ 3 minutes) for a total of 3 X 3 + 3 = 12 minutes.

3.2 NEW PROBLEMS IDENTIFIED.

During the December 1993 retest, some new problems were identified.

a. An error exists in the IDD for the Runway Visual Range System Data Processing Unit to Maintenance Processor Subsystem Rev G, which is potentially confusing. On page 19, 3.1.3.1.7 note 2 displays the Lowest Replaceable Unit (LRU) Status Field for the fault-diagnostic-command format. The note gives Logical Unit (LU) numbers for different units. The IDD shows that LU numbers for SIEs range from 0x28 through 0x3C. This range represents all 18 VS SIEs, the Ambient Light Sensor (ALS) SIE, and only the first two Runway Light Intensity Module (RLIM) SIEs. This should be corrected to show that LU numbers for SIE LRUs exist from 0x28 through 0x46. This includes the remaining RLIM SIEs. (See page 9, TTR-082)

b. When the user logged off from the DPU, there were additional

unexplained log off state change messages from LU data point 2120 (MDT Log on Status of the Terminal Communications LU). The number appeared to be related to the security level that the user logged on at, but the specific relationship could not be determined. The message was not related to any reset of the MPU or other communication problem. Sometimes, the messages came in a group of two or three. Sometimes, one of the messages came minutes after the previous log off message. Only one log off message was expected each time the local terminal timed out or the user logged off. (See page 10, TTR-083)

c. A previously reported problem was noticed to have additional complexity and was increased in priority to a critical problem. The problem was "RMS resets itself with any command under conditions (TTR-074)". During the December 1993 retest, the RMS did not send priority (or any) messages to the MPS for about 1 hour. This problem may have existed for some time, but was not clearly identified as a significant problem until the retest. Testing was being performed on a visibility sensor (VS SIE 01) and the Engineering Data Port was being monitored. Window contamination alarms were being called out by AOS-220 personnel and the sensor was going off and on line. During this time, no alarms or state changes were seen at the protocol analyzer connected to the MPS-RMS interface. The MDT at the visibility sensor was disconnected to avoid any possible problems due to the RVR going into a local mode. An MDT connected to the DPU was used to log on and check the security level. The security level was found to be set to one. The MDT was then used to log on and off at the DPU. There were not any state changes or NAS-MD-790 messages of any kind present. The MPS continued to poll as expected and the RMS continued to respond as expected but no messages appeared on the protocol analyzer. To date ACN-100D has not been able to create this problem at will, but has successfully predicted its conditions. If the system does not produce any messages for about 30 minutes, the probability of having the Reset problem is very great. Further research into this problem is required to identify a procedure to duplicate it. Until a better procedure for duplicating the problem can be determined, the problem reproduces itself often.

d. The VS (DP 46) and ALS (DP 3F) Rate of Change was used for providing the temperature of the sensor head. At the MPS, the data point was not monitored. At the MDT the Rate of Change was displayed as usual but instead the head temperature value was displayed. This was a temporary engineering change which should now be completed. The Rate of Change value needs to be restored. The head temperature of the sensor will need a data point assigned to it to provide a means for sending this information to the MPS. (See page 11, TTR-084)

3.3 ADDITIONAL OBSERVATIONS/CONCERNS.

In addition to the new changes to the RVR and the new problems identified, there were discussions of previous problems and additional concerns.

a. In TTR-029-R01 a "General comment on scaling factors" was made.

The TTR describes that the value sent to the RVR using IMCS is not identical to the value that is set when the RVR gets the command from the MPS. This discrepancy is caused by using different scaling factors at the RMS than at the MPS. If scaling factors with powers of ten were u d at both, the problem would be undetectable. The scaling factor at the MPS for the DPU Plus 12 volt power supply is 0.01 (LU 25 DP 30 with range 0 to 1259). The scaling factor at the RMS for the same DP is 0.05859. With the current scaling factors, a value of 12.00 volts DC entered at the MPS using IMCS would fall between two possible RVR values. The MPS value of 12.00 x 0.05859 would become 204.81 at the RVR. This value at the RVR could be 204 or 205. When this value was entered, the RVR rounded the value up to 205. This value was returned to the MPS as a threshold change and was displayed on the IMCS status screen as 12.01 volts.

The IDD is confusing in the approach to this problem. Also it is incorrect. The IDD stated that RVR units are 0.0586 Vdc but at an MDT connected to the DPU the units are 0.05859 Vdc. The IDD also states that the units at the MPS are 0.01 Vdc. This implies that the granularity is also 0.01 Vdc. At the RVR values are integers with a range from 0 to 215. A value of 204 will be 11.95 at the MPS. A value of 205 will be 12.01. The actual granularity is 0.06. This problem with the IDD affects all data points which have a range of values.

b. When the VS or ALS SIEs go off line, there are usually no hard alarms issued. There is only a state change message to indicate that the sensor has gone off line. The state change message has a condition status of normal. While testing in September and December, it was noticed that there were usually no indications other than the state change message for the sensor going off line. When the sensors go off line, the Controller Display (CD) shows "FFFF" for that sensor as an indication of a failure. Although there are no NAS-SS-1000 Volume I requirements for landing systems going off line, there are requirements for navigational systems. The two requirements are:

1. 3.2.1.2.5.i Navigation facilities that shut down shall provide an alarm or alert to appropriate air traffic control positions within 2 minutes;

2. 3.2.1.2.5.k Upon detection of changes in the status of the navigation system signal being monitored, the supplemental navigation system monitors shall provide a status alert to appropriate air traffic positions within 2 minutes.

These are also requirements of the RMS for navigation systems. Although the RVR is not providing a signal as critical as a navigation system to pilots or Air Traffic Control, it is providing valuable landing information. Lack of this important landing information should be documented. Since the RVR has a failure due to a sensor going off line, and since the CD shows "FFFF" when this occurs, it would be logical to expect that there would be an alarm from the RMS to mark the event for future reference in the IMCS history files.

c. There is no monitoring of the CDs. The CD is installed in the tower cab to provide the RVR product to controllers and air traffic. The CD contains software to set up and display runway information/configurations, give an audible/visual alarm when the product fails, and perform diagnostics. The only portion of the CD which is remotely monitored is the communication link between it and the DPU. Originally this subsystem was to be used temporary until the Tower Control Computer Complex (TCCC) interface was available. The MPS to RMS is the only interface which has been fully implemented for the RVR so the CD will continue to provide RVR product information until it is replaced. Since the CD is a key element of the RVR's ability to provide the service, it should be considered for remote monitoring.

4.0 CONCLUSIONS.

The following paragraphs describe conclusions based on observations made during the retesting of the RVR. Conclusions for the RVR decoder for IMCS are described separately from the RVR RMS to allow deployment of completed work.

4.1 IMCS DECODER FOR RVR.

The Decoder for IMCS has been completed to agree with the latest version of the IDD (June 07, 1993 Revision G). All RVR decoder problems have been resolved except for TTR-019 which states "The RVR IMCS decoder does not provide a site certification status screen or command." This remaining TTR requires action from AOS-220 and possibly coordination with ANA-700 to define parameters which can be remotely certified. No new decoder problems were identified in the December 1993 retest.

4.2 RVR RMS.

One problem remains with the RVR RMS which must be resolved before remote monitoring of the RVR system can be accomplished. In addition to this major problem, other actions are recommended prior to deploying the RVR system,

a. The lack of priority messages (alarms and state changes) when the RMS exhibited the conditions of the reset problem (TTR-074 R03) is a major problem. This newly identified characteristic is a problem which must be resolved before remote monitoring of the RVR system can be accomplished.

The existing problem with the MPU resetting itself when it receives a command from the MPS and the newly identified lack of messages, needs to be investigated and resolved. A work around exists for the reset problem because, by continuing to send the command, the expected response was eventually received (after the third command). The failure of an RVR RMS to identify alarms, alerts, and state change messages is a major problem intrinsic to the remote monitoring of the RVR system. The cause of this problem needs to be identified. It is imperative that an investigation be made to determine the procedure needed to create and resolve the

problem. A concentrated effort in this area is needed to yield the desired results.

b. Due to changes made to the RVR system for monitoring of sens head temperature, dirt and precipitation modes, and window contamination alarm delay periods; the Program office (ANN-400), field users, and the MAP office (ANA-700) should meet to discuss the need to remotely monitor any additional parameters, modify the IDD, and modify the RVR decoder for IMCS.

c. Due to the variation in the window contamination monitored value, the sensors should be retested with real contamination (graphite, dirt, chocolate/water mixture, or other) to determine the typical stability that can be expected. Based on this testing, the selected 2 1/4 unit threshold for going from precipitation mode to dirt mode should be reevaluated. If required, the value can be increased to avoid masking alarms due to actual contamination.

d. Due to changes to the function and operation of the RVR system and the length of time the RVR has been undergoing testing, the need to train site and maintenance control center personnel should be considered. Training for new system functionality and existing system problems needs to be addressed.

e. Certification of the RVR has recently been identified. The certification process needs to be reviewed to determine steps which might be performed remotely. Although total system certification cannot be accomplished by remote means, perhaps parameters which indicate lack of certification can be described. In this way the certification can be assisted by remote monitoring. If, after this review, remote certification is deemed inappropriate, then the requirement must be addressed by creating a waiver before the existing TTR can be closed.

f. Several previously identified TTRs still remain open. Most are of minor importance or less but some major TTRs are open. All open TTRs should be scheduled for resolution and correction.

5.0 RECOMMENDATIONS.

The RVR RMS is not ready for national deployment due to existing problems, the newly identified problems, and the conclusions presented in section 4.

The IMCS decoder module for RVR currently meets the latest version of the IDD (June 07, 1993 Revision G). All RVR decoder problems have been resolved except for the certification issue. As a result the RVR decoder can be deployed.

Based on the conclusions presented in section 4, the following recommendations should be resolved prior to national deployment:

a. The lack of priority messages (alarms and state changes) when

the RMS exhibited the conditions of the reset problem (TTR-074 R03) must be investigated and corrected.

The existing problem with the MPU resetting itself when it receives a command from the MPS and the newly identified lack of messages needs to be investigated and resolved.

b. The Program office (ANN-400), field users, and the MAP office (ANA-700) should meet to discuss the need to remotely monitor any additional parameters, modify the IDD, and modify the RVR decoder for IMCS. The possible changes are for monitoring of sensor head temperature, dirt and precipitation modes, and window contamination alarm delay periods.

c. The sensors should be retested with real contamination (graphite, dirt, chocolate/water mixture, or other) to determine the typical stability that can be expected. This empirical result should be used as the threshold for going from precipitation mode to dirt mode.

d. Training (retraining) should be initiated for all personnel who require it. The training should address any new system functionality that has been added since training was first given.

e. The certification process needs to be reviewed to determine steps which might be performed remotely. These Remote Certification steps should be identified and included in any description for certification and maintenance as described in Order 6000.15B paragraph 167. In the notice a clear statement should be given cautioning that total system certification cannot be accomplished by remote means but that problems identified by using the remote certification process could be grounds for removing certification on the system.

All open TTRs should be scheduled for resolution and correction prior to national deployment. ACN-100D also recommends that retesting be considered for any future system changes which could impact the Remote Maintenance Monitoring (RMM) capability. ACN-100D insists on notification of any system changes being considered. The notice should be at least 30 days in advance of any retesting needed. The notice should identify changes and include assessment of the impact on the RMM capability. ACN-100D needs the advance notice in order to develop test scenarios for the system changes.

Resolution of other open problems is required prior to national deployment of the system. ACN-100D recommends that a meeting or telephone conference be arranged to discuss the resolution and completion of these items.

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 082-R05
TTR TITLE: IDD Error, Incorrect SIE LU Number Range	TTR PRIORITY: V OTHER
ORIGINATOR: Ray Haines	OBSERVED: 12/10/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: None
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Documentation
REFERENCE: REV/VOL G PAGE 19 PARA 3.1.3.1.7 Note 2	
TEST SEQUENCE: ID --- STEP --- PAGE ---	
TTR ORIGIN: Observation	PROBLEM REPRODUCED? N/A If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A error exists in the Interface Design Document for the Runway Visual Range System Data Processing Unit to Maintenance Processor Subsystem Rev G, which is potentially confusing. On page 19, 3.1.3.1.7 note 2 displays the LRU Status Field for the fault -diagnostic-command format. The note gives LU numbers for different units. The IDD shows that LU numbers for SIEs are from 0x28 through 0x3C. This range represents all 18 VS SIEs, the ALS SIE, and only the first two RLIM SIEs. This should be corrected to show that LU numbers for SIE LRUs exist from 0x28 through 0x46 to include the remaining RLIM SIEs.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

10

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 083-R05
TTR TITLE: Multiple State Changes When User Logs Off At DPU	TTR PRIORITY: IV ANNOYANCE
ORIGINATOR: Ray Haines	OBSERVED: 12/06/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-SS-1000 Volume V
REV/VOL V PAGE -- PARA 3.2.1.1.4.2.7

TEST SEQUENCE: ID --- STEP --- PAGE ---

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When the user logged off from the DPU, there were additional unexplained log off state change messages from data point LUID 2120 (MDT Log on Status of the Terminal Communications LU). The number appeared to be related to the security level that the user logged on at, but the specific relationship could not be determined. The message was not related to any reset of the MPU or other communication problem. Sometimes, the messages came in a group of two or three. Sometimes, one of the messages came minutes after the previous log off message. Only one log off message was expected each time the local terminal timed out or the user logged off.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 084-R05
TTR TITLE: Rate-of-Change DP was Temperature at MDT	TTR PRIORITY: III MINOR
ORIGINATOR: Ray Haines	OBSERVED: 12/06/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: Interface Design Document (June 7, 1993) REV/VOL G PAGE 51&53 PARA 3.2.1.1.4.2.7	
TEST SEQUENCE: ID --- STEP --- PAGE ---	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The VS (DP 46) and ALS (DP 3F) Rate of Change was used for providing the temperature of the sensor head. At the MPS, the data point was not monitored. At the MDT the Rate of Change was displayed as usual but instead the head temperature value was displayed. This was a temporary engineering change which should now be completed. The Rate of Change value needs to be restored. The head temperature of the sensor will need a data point assigned to it to provide a means for sending this information to the MPS.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

12

AOS REPORT FOR RETEST 6

Memorandum

Department of Transportation
Federal Aviation Administration

Subject: ACTION: Operational Test & Evaluation Shakedown Report for the New Generation RVR (FA-10268), Denver Airport Configuration

Date: DEC 22 1993

From: Manager, Environmental Support Engineering Branch, AOS-220

Reply to Attn of: Sanayi:(405)954-

To: Test Director, Weather Processors, ACW-200B

Operational test and evaluation (OT&E) shakedown activities continued on the new generation Runway Visual Range (RVR) System, FA-10268, (Denver International Airport configuration) December 6-10, 1993, at the Kansas City International Airport. Updated EPROM's were installed for the Maintenance Processing Unit (MPU), Product Processing Units (PPU), Visibility Sensors (VS), and the Ambient Light Sensor (ALS).

The software versions used at Kansas City, Missouri, were the versions requalified at Teledyne Controls the previous week:

MPU	3.0
PPU	3.1
VS	3.1
ALS	3.1
RLIM	2.3
CD	2.4

The majority of the retesting activities concentrated on the newly installed lookdown Visibility Sensors (VS). It was again noted during testing that, with precipitation in sunlight, the RVR product changed significantly and at times took the VS off-line.

The calibration verification of the VS's can now be successfully accomplished on both the high and low side of the calibration plate.

The Ambient Light Sensor (ALS) testing with precipitation indicated that the ALS gain setting needs further study and possibly changes. After the window was cleaned, sprayed with water, and allowed to dry, the window contamination remained very high and would not return to an expected low value.

The Onsite Technical Instruction book, TI 6560.17, had errors that will need to be corrected before the book is provided to Denver.

It was noted that the Data Processing Unit (DPU) screens do not present the VS's transmitter and receiver window contamination precipitation/dirt mode status. This leads to uncertainties when the VS does not warn or alarm at the expected values.

The prototype Controller Display (CD) was evaluated by the Air Traffic Controllers at Kansas City International Airport both in the tracon and tower cab. The evaluation in the tower cab was performed only in bright sunlight. Attached is a summary of the results of the evaluations. Following is a summary of the comments obtained:

1. The on/off switch light intensity was too bright for the tracon and correct for the tower cab.

2. The on/off switch bezel protection was sufficient to prevent inadvertently turning off the switch.

3. The keypad backlighting should be separately adjustable from the RVR product display, and some suggested that the backlighting should not be allowed to be turned off.

4. The health LED adjustment was necessary.

Based on the results of the shakedown testing to date, the OT&E Shakedown test team recommends deployment of the Denver Configuration RVR to the Denver International Airport. OT&E shakedown testing on the baselined production system and resolution of the DRR checklist issues will need to be accomplished before national deployment.

David W. Fleming

Attachments

cc:
AAF-11
ACN-100D
ANN-600
ANN-200
FAA AFSFO Kansas City, MO
FAA QRO Wilbert Bentley
ASM-100
AOS-200
ACE-420
ANS-420

CONTROLLER EVALUATION OF THE PROTOTYPE RVR DISPLAY

Ten air traffic controllers evaluated the CD at the tracon and five air traffic controllers evaluated the CD at the tower cab and here are the results.

Is the On/OFF switch intensity too bright, too dim, or just right?

Tracon	too bright	7	too dim	0	just right	2	N/A	1
Tower Cab	too bright	0	too dim	0	just right	5		

Does the backlighting on the keypad need to be adjustable? If so, should it be separately adjustable from the backlighting?

Tracon	Yes	8	No	2
Tower Cab	Yes	5	No	0

Is the Bezel protection for the ON/OFF switch sufficient to prevent inadvertently turning the switch off?

Tracon	Yes	10	No	0
Tower Cab	Yes	5	No	0

Is the health LED adjustment necessary?

Tracon	Yes	6	No	4
Tower Cab	Yes	3	No	2

General Comments or any proposed refinements:

Backlighting should not be allowed to be turned off.

APPENDIX G
RETEST 7
OT&E Operational, Integration, and Shakedown Reports

AOS REPORT FOR RETEST 7

U.S. Department of Transportation
Federal Aviation Administration

Memorandu

DRAFT

Subject: ACTION: Operational Test & Evaluation Shakedown Test Report for Teledyne Controls Runway Visual Range System

Date:

Reply to Attn of:

From: Manager, Environmental Support Engineering Branch, AOS-220

To: Test Director, Weather Processors, ACW-200B

Operational test and evaluation (OT&E) shakedown test activities continued on the new generation Runway Visual Range (RVR) System, FA-10268, June 6-10, 1994, at the Kansas City International Airport (MCI). Finalized EPROM's and first article equipment was installed prior to the start of testing.

The software versions used at MCI, were qualified at Teledyne Controls during design qualification May 24 through June 2 1994.

MPU	4.0
PPU	4.0
VS	4.0
ALS	4.2
RLIM	4.0
CD	4.3

The retesting activities concentrated on the new first article lookdown Visibility Sensors (VS), VS and ALS SIE cabinets, ALS, Data Processing Unit (DPU), and Controller Display (CD).

Testing results indicate the following:

Precipitation in the scatter volume under conditions with sunlight can cause the VS to go off-line.

During cloudy conditions (low skylight) the VS would not calibrate within the tolerances specified for the high and low side of the calibration plate. Also the calibration plate and locator pin did not fit correctly on VS #4.

The Ambient Light Sensor testing with precipitation was satisfactory. When the window was sprayed with water and allowed to dry, the window contamination returned to a low value.

The right angle MDT connector was not available for the Runway Light Intensity Monitor (RLIM) SIE cabinet testing.

DRAFT

The Onsite Technical Instruction book, TI 6560.17, was reviewed. The battery check procedure needs to be updated to incorporate procedure using the new location of the voltage test points.

The Data Processing Unit (DPU) continues to exhibit the apparent RMS interface sleep problem.

The Controller Display (CD) was evaluated by the Air Traffic Controllers both in the tracon and tower cab. All discrepancies/improvements noted during previous OT&E activities have been corrected. The CD's are now satisfactory.

Of the 110 discrepancy/improvement forms opened during the previous seven ST&E events all have been closed with the exceptions of those AOS will pursue after deployment, and those to be tracked as part of the transition plan.

Based on the results of the shakedown testing, the OT&E shakedown test team recommends baselining and deployment of the FA-10268 RVR at this first article design level and the listed software versions.

Joe L. Downs

ACW REPORT FOR RETEST 7

PRE-DEPLOYMENT TEST REPORT

for the

RUNWAY VISUAL RANGE SYSTEM (RVR)

DESIGN QUALIFICATION TEST (DQT)
and
OPERATIONAL TEST & EVALUATION (OT&E) RETEST

JULY 1994

Prepared by:

Weather/Primary Radar Division ACW-200B
Federal Aviation Administration Technical Center
Atlantic City International Airport
Atlantic City, NJ 08405

EXECUTIVE SUMMARY

This report details the results of Design Qualification Testing (DQT) of the Runway Visual Range (RVR) system at Teledyne Controls (TDY) in Los Angeles, California, as well as Operational Test and Evaluation (OT&E) Operational and OT&E Integration retest at Kansas City International Airport, Kansas City, MO.

DQT testing was performed from May 23, 1994 to June 3, 1994 by Teledyne Controls and was witnessed by Federal Aviation Administration representatives from ACW-200, ANN-400 and AOS-220. DQT consisted of sub-system, system, environmental, and Electromagnetic Interference (EMI) tests. The testing was conducted in accordance with procedures established by Teledyne Controls and reviewed by ACW-200.

OT&E testing was conducted from June 6, 1994 to June 21, 1994 at the Kansas City International Airport (MCI) in Kansas City, Missouri. Tests were performed by representatives from ACN-100D, ACW-200 (Test Director) and AOS-220 using subsets of approved OT&E test procedures.

This round of DQT and OT&E testing was intended to qualify the current configuration of software and hardware for acceptance into the National Aerospace System (NAS). The hardware and software configuration of the RVR system has undergone numerous changes as the result of discrepancies discovered during previous rounds of OT&E testing.

Resulting test discrepancies encountered include:

(1) Hard alarms are not always reported via the Remote Maintenance Subsystem (RMS) interface.

(2) The Technical Instruction (TI) manual still requires rework in chapters 6 and 9.

(3) TI manual has miscellaneous errors that require correcting.

(4) A problem exists with Visibility Sensor (VS) calibration on a cloudy day.

(5) Simulated rain falling through the VS sample volume in the presence of bright sunshine causes unpredictable responses from system.

(6) No indication from RMS if Ambient Light Sensor loses calibration.

(7) A particular Hard Alarm message is returned to the MPS as a status only message.

(8) Two monitoring test points are not connected to the proper place.

(9) Under certain conditions, "Availability" status message returned from the RMS is not correct.

The above-mentioned discrepancies, as well as others of lesser impact, are considered to be non-critical with respect to National Deployment of the RVR system. Based on the results of this and other testing, ACW-200 is recommending the National Deployment of the current configuration of the RVR system subject to the conditions stated in the recommendation section of this report.

1.0 PURPOSE.

The purpose of this report is to provide results of the Runway Visua Range (RVR) System retest. Testing was performed on what is expected to be the deployment configuration of the RVR system. Test results reported include those for Design Qualification Testing (DQT) at Teledyne Controls (TDY) California, from May 23, 1994 to June 3, 1994, and Operational Test and Evaluation (OT&E) at Kansas City International Airport from June 6, 1994 to June 21, 1994.

2.0 SCOPE.

This report is based on test results that were evident during testing. Any items that are not specifically related to the conducted tests, but could affect recommendation for deployment, will be noted in the section entitled "RECOMMENDATIONS" (section 7.0).

Shakedown discrepancies are included in the AOS-220 Operational Test & Evaluation Shakedown Test Report.

This report is not intended, nor should it be used as a substitute for the final test report. Findings and recommendations herein apply to those released versions of software listed in Section 3.

3.0 BACKGROUND.

This was the sixth regression test conducted on the RVR system. In addition to the new release of RVR software, a new release of the Interim Monitor and Control (IMCS) decoder module was installed on t. Maintenance Processor Subsystem (MPS). The decoder module interfaces with the RVR Remote Maintenance Subsystem (RMS). The released software version numbers for the RVR Systems Interface Electronics (SIE) were as follows:

Maintenance Processing Unit (MPU), Rev 4.0
Product Processing Unit A (PPU A), Rev 4.0
Product Processing Unit B (PPU B), Rev 4.0
Visibility Sensor 01 ("LKDNW" 01), Rev 4.0
Visibility Sensor 02 ("LKDWN" 02), Rev 4.0
Visibility Sensor 03 ("LKDWN" 03), Rev 4.0
Visibility Sensor 04 ("LKDWN" 04), Rev 4.0
Ambient Lighting Sensor (ALS), Rev 4.2
Runway Light Intensity Monitor (RLIM), Rev 4.0
Controller Display (CD), Rev 4.3

4.0 TEST DESCRIPTION.

DQT consisted of sub-system, system, environmental, and Electromagnetic Interference (EMI) tests. The testing was conducted in accordance with procedures established by Teledyne Controls and reviewed by ACW-200. Subsystem and system testing concentrated on the specific changes made to the software to correct previously noted problems; however, regression testing was also performed to ensure that other functionalities of the system had not been affected by the software modifications.

OT&E Testing consisted of OT&E Integration, OT&E Operational and OT&E Shakedown as defined in FAA Order 1810.4B. OT&E Shakedown and OT&E Integration test procedures were a subset of those employed in the initial OT&E Testing of the New Generation RVR system. OT&E Operational Testing consisted primarily of informal observations by the three test organizations as well as site personnel. User input was solicited to verify approval of changes made to the RVR Controller Display (CD). Observations were intended to verify the operational effectiveness and suitability of the RVR system as outlined in FAA Order 1810.4B.

The performing organizations were ACN-100D (Integration), AOS-220 (Shakedown) and ACW-200 (Operational/Test Director).

5.0 TEST RESULTS.

Design Qualification Test.

DQT procedures conducted at Teledyne Controls were completed successfully. EMI and environmental test reports are pending.

Integration.

Integration testing of the RVR is almost exclusively related to the Remote Maintenance Subsystem (RMS) interface. One significant discrepancy remains. The problem involves hard alarms not always being reported by the RMS when an "off-line" (or failure) condition occurs. It is believed this is related to a previously documented problem with incorrect responses from the RMS interface. Post-test analysis indicates the RMS interface may be shutting down if it experiences periods of inactivity longer than 10 to 15 minutes. The interface will continue its normal health checks with the MPS, but will fail to initiate or respond to data exchanges. A Test Trouble Report (TTR) was generated outlining the discrepancy.

Additional discrepancies noted during Integration testing include:

(1) "Data Validity Hard Alarm" message is returned to the MPS as a status only and not as a Hard Alarm with a Return to Normal (RTN).

(2) When an availability status change has occurred, the "Availability" message returned to the MPS from the RMS is not correct. It is correct at the Portable Maintenance D: Terminal (PMDT).

(3) IMCS indicates "command received by site" even if RMS is not responding.

(4) Two monitoring voltage test points in the DPU are tied to the wrong place.

(5) There is no indication from the RMS when the Ambient Light Sensor (ALS) loses calibration.

Additionally, Integration testing resulted in the closing of 9 of 16 TTRs from previous testing. Four new TTRs (three minor and one other) were generated during this phase of testing.

Operational & Shakedown.

The following problems were observed and are considered open at this time.

(1) Visibility Sensor (VS) calibration does not meet the tolerance specification on a cloudy day.

(2) The TI manual requires rework in chapters 6 and 9.

(3) TI manual has miscellaneous errors that require correcting.

(4) Simulated rain falling through the VS sample volume in the presence of bright sunshine causes unpredictable responses from system. Corrections made to system have made significant improvements in increasing system immunity to this phenomena; however, the problem still appears to exist to some degree.

6.0 CONCLUSION.

The overall system performance under all conditions has improved significantly. The primary areas of concern at this time are:

(1) the need for additional verification of system ability to maintain accuracy and operational status under all weather conditions; and

(2) proper operation of the RMS interface regardless of frequency of data exchanges. In addition, numerous support and documentation discrepancies presently exist.

7.0 RECOMMENDATIONS.

ACW-200 recommends National Deployment of the New Generation Runway Visual Range system subject to the following conditions:

1. Because of the potential operational impact of the RMS communications problem, an automated work-around should be built into the RVR RMS interface to ensure full RMS functionality while the cause of the problem is being resolved. This work-around should be retro-fitted into any deployed systems within one month of the Deployment Readiness Review (DRR). Teledyne Controls should be directed to correct the RMS communications problem as soon as possible. A new version of software should undergo regression testing and be deployed immediately when the problem has been corrected.

2. The RVR system should undergo additional testing to better define both software and hardware response to severe weather conditions as well as response to rain during bright sunlight conditions. Previous testing has indicated the need to "fine tune" the algorithm for the heater control, extinction coefficient, and contamination conditions.

3. EMI and Environmental Test reports should be reviewed for compliance and any necessary corrective actions taken.

ACN REPORT FOR RETEST 7

DOT/FAA/CT-TN94/XXX

National Airspace System (NAS) Operational Test and Evaluation (OT&E) Integration Retest of the Runway Visual Range (RVR) System Remote Monitoring Subsystem (RMS)

DRAFT

QUICK LOOK REPORT
For Retest of June 13-20, 1994

July 1994

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

U.S. Department of Transportation
Engineering, Test, and Evaluation Service
ATC Sustaining Engineering Division
Maintenance Automation Program
FAA Technical Center
Atlantic City International Airport, N.J. 08405

This document describes the preliminary results of National Airspace System (NAS) Operational Test and Evaluation (OT&E) Integration Test of the Remote Monitoring Subsystem (RMS) for the Runway Visual Range (RVR) System. NAS OT&E Integration t was performed from June 13, 1994 to June 20, 1994 at the Kansas City International Airport (MCI) Control Tower building in Kansas City, Missouri. A dial-up was used fo accessing the Interim Monitor and Control Software (IMCS) on the Maintenance Processo Subsystem (MPS) which resided at the Kansas City Air Route Traffic Control Center (ARTCC) in Olathe, Kansas (ZKC). The IMCS and decoder for the RVR was executed in an independent test pathway. The LM-1 Protocol analyzer, Olympic version 8.0 and the AC 350 MPS simulator, version 4.00 were used as test tools. ACN-100D from the Federal Aviation Administration (FAA) Technical Center performed the testing with support fro Maintenance Automation of the Kansas City ARTCC, the MCI-AFSFO NAVCOM unit of the control tower, and ACE-453 of the Central Region. ACW-200B of the FAA Technical Cent was present as a representative of the Associate Program Manager for Test (APMT).

OT&E Integration testing verifies whether the RVR system functions as an integrated component of the Remote Maintenance Monitoring System (RMMS) and ensures that the NAS-SS-1000 (Volumes I and V), NAS-MD-790, and system requirements are satisfied. Th testing was a follow-up test after corrections were directed by the program office to close out previously identified Test Trouble Reports (TTR's). TTR's were created as a result of previous NAS OT&E Integration Testing of the RVR RMS during tests in March 1992, August 1992, November 1992, June 1993, and December 1993. The RVR program offic (ANN-140) and the Maintenance Automation Program Division (MAP) (ANA-700) requested that ACN-100D perform the testing to determine the status of corrections made to the RVR RMS. The status of the corrections and the results of the integration test will assist in determining the deployment readiness of the RVR system. All test sequences for the NAS OT&E Integration Test of the RMS for the RVR were conducted and completed. All previously reported TTR's which were still open were tested to determine thei current status. TTR's identified as open problems are found in Attachment A foll ng the TTR summary. TTR's identified as an closed problems are found separately in Attachment B.

There is only one open major (priority II) problem which could affect the deployment o the RVR system. The problem is the MPS-RMS communication interface problem (TTR-074) which could cause RMMS data to be lost. The symptoms of this problem are only apparen when an MPS command is sent to the RVR. TTR-074 describes the problem when the RMS does not execute application level commands from the MPS.

OT&E Integration testing did not identify any additional critical or major problems. However, four additional minor problems were identified. Nine previously reported problems are now closed but some previous problems remain open. The RVR RMS has one open major (priority II) problem, six open minor (priority III) problems, three open annoyance (priority IV) problems, and one open other (priority V) problem. The IMCS decoder for the RVR has no open problems remaining except certification status which requires identification of remote certification parameters and a command (to the RMS) to test and gather them.

Once a plan is in place for monitoring and correcting the MPS-RMS interface problem (TTR-074), the RVR RMS is ready for national deployment. Every effort should be made to correct the interface problem as soon as possible. The other open problems should be corrected in the future when enhancements to the RVR are considered.

The IMCS decoder module for RVR currently meets the latest version of the Interface Design Document (IDD, May 17, 1994 Revision H). All RVR decoder problems have been resolved except for the certification issue (TTR-019). As a result the RVR decoder can be deployed.

ATTACHMENT A

RVR RMS INTEGRATION TEST

TEST TROUBLE REPORT (TTR) SUMMARY

AND OPEN TTR's

FOR June 13-24, 1993

NAS OT&E Integration Retest

Summary of Test Trouble Reports
For The NAS OT&E/Integration Testing
Of The Runway Visual Range
Remote Monitoring Subsystem

The following Test Trouble Reports (TTR) were examined during the testing described in this test report. TTR's with an R following the TTR number were found during a retest. The retest number is added to the right of the R so that this information can be easily viewed.

TTR #	System	Description of Problem	Opened	Closed	Priority	Status
001	RMS	RMS allows Status Command from MPS when in Local Control Mode	03/20/92	08/18/92	III	Closed
002	IMCS	RVR IMCS Status Screen typographic error (DP 3C on LU's 28-33)	03/20/92	08/18/92	IV	Closed
003	RMS/ IMCS	RMS Site Address should be Hexadecimal and odd	03/23/92	08/18/92	II	Closed
004	IMCS	RVR IMCS Status Screen typographic error (DP 3F on LU's 28-33)	03/23/92	08/18/92	IV	Closed
005	IMCS	Runway Lighting Consistency Status not available at MDT	03/23/92	08/18/92	III	Closed
006	RMS	RLIM SIE Link Error value not available at MDT	03/23/92	08/18/92	III	Closed
007	RMS	RVR does not work with dead or disconnected battery	03/23/92	11/10/92	I	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR #	System	Description of Problem	Opened	Closed	Priority	Status
008	RMS	RVR failed to indicate a battery condition alarm	03/23/92 (Retested 06/15/93, 09/22/93, 12/10/93, 06/13/94)		III	Open (Priority downgraded with AOS-220 maint procd 12/10/93)
009	RMS/ IMCS	Loss of AC power should be Hard Alarm	03/23/92	08/19/92	III	Closed
010	RMS/ IMCS	Disabling the battery results in ALARMED HIGH with low value	03/23/92	11/10/92	III	Closed
011	RMS/ IMCS	Value displayed on IMCS screen does not always represent the current or typical value	03/23/92	08/19/92	V	Closed
012	RMS	No Hard Alarm threshold values for DPU power supplies	03/23/92	08/19/92	III	Closed
013	RMS	RMS allows Equipment Control commands from MPS when in Local Control Mode	03/23/92	08/18/92	I	Closed
014	RMS/ IMCS	Valid Archive Data Retrieval command results in command error that is not displayed at MPS	03/23/92	08/18/92	III	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR #	System	Description of Problem	Opened	Closed	Priority	Status
015	RMS	RVR stopped responding after completion of Master Reset Command	03/23/92	09/15/92	I	Closed
016	RMS	No Site Data Report after Fault Diagnostics Command	03/23/92	08/18/92	III	Closed
017	RMS	RVR rejects valid Fault Diagnostic Command from MPS	03/23/92	08/21/92	II	Closed
018	RMS	Remote Certification Parameters have not been identified	03/23/92 (Retested 06/15/93, 09/22/93, 12/06/93, 06/13/94)		III	Open (Follow-up status: Param defined, incorp later 1/21/93)
019	IMCS	RVR IMCS Decoder does not provide Certification Status screen	03/23/92 (Retested 06/15/93, 09/22/93, 12/06/93, 06/13/94)		III	Open (Follow-up status: param defined incorp later 1/21/93)
020	RMS	IMCS Threshold Charge parameters do not agree	03/30/92	08/19/92	III	Closed
021-R01	IMCS	LU 0X20 DP FF Does Not Exist in RVR IDD	08/18/92	11/10/92	III	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR #	System	Description of Problem	Opened	Closed	Priority	Status
022-R01	IMCS	Not all State Change messages displayed on 25th line	08/18/92	11/10/92	III	Closed
023-R01	IMCS	IMCS command parameter values not in expected units	08/18/92	12/10/93	IV	Closed
024-R01	RMS	RTN for LU 26 and LU 27 do not agree with IDD	08/18/92	11/17/92	II	Closed
025-R01	RMS	No hard alarm capability	08/19/92	06/24/94	II	Closed
026-R01	RMS	Recovery from communication failure requires Fault Diagnostic Command	08/20/92	11/10/92	I	Closed
027-R01	RMS	No indication at MDT with ALS SIE controller fault	08/20/92	09/23/92	II	Closed
028-R01	RMS/ IMCS	Threshold values differ between IMCS and MDT	08/20/92	10/05/92	III	Closed
029-R01	RMS	General comment on scaling factors	08/20/92	06/24/94	II	Closed
030-R01	IMCS	Terminal Message should not display on 25th line.	08/20/92	06/22/93	IV	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR #	System	Description of Problem	Opened	Closed	Priority	Status
031-R01	RMS	RMS doesn't display the on-line or off-line status	08/20/92	11/10/92	III	Closed
032-R01	IMCS/ MPS	MPS failed to send commands unless RMS message was received from RMS first	08/21/92	09/22/93	II	Closed
033-R01	RMS	Command Error messages are incomplete because they didn't include entire command message	08/21/92	06/15/93	III	Closed
034-R01	IMCS	IMCS History Report not consistent in position of LU when printing LUID	08/21/92	09/22/93	IV	Closed
035-R01	IMCS	The command error response should be included in IMCS History Report	08/21/92	12/10/93	IV	Closed
036-R01	IMCS	The Point No field of the IMCS User History Report should identify the data point for Equipment Control Commands	08/21/92	09/22/93	IV	Closed
037-R01	RMS	The RVR rejected a correct Diagnostic Command for LU 34	08/21/92	11/10/92	II	Closed
038-R01	RMS	The RVR often sends out garbage data which has to be re-sent	08/21/92	11/10/92	I	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
039-R01	IMCS	IMCS History Report indicates "Normal" when RTN is received. These are not equivalent indications	08/21/92	12/10/93	III	Closed
040-R01	RMS	The VS SIE 04 sensor failed to report an alarm when it was contaminated	08/21/92	11/10/92	III	Closed
041-R01	RMS	The RMS did not RTN until alarms were viewed at the MDT for LU 25 DP 31 and LU 27 DP 2C	08/21/92	10/08/92	III	Closed
042-R01	RMS	RMS did not send RTN for LUID's 352A and 362A	08/21/92	10/07/92	II	Closed
043-R01	RMS	Note 9 in the IDD for LU OX25 is unclear	08/21/92	11/10/92	IV	Closed
044-R01	RMS	No alarm when MPU AC Power is removed	08/20/92	11/11/92	III	Closed
045-R01	RMS	LU OX34 returned undefined data	09/29/92	11/11/92	II	Closed
046-R01	IMCS	Time stamp mismatch of command vs IMCS user history report	09/29/92	01/20/93	III	Closed
047-R01	RMS	Wrong busy message format by RMS	09/29/92	11/11/92	II	Closed
048-R01	IMCS	IMCS did not identify incorrect busy message format	09/23/92	01/20/93	III	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
049-R02	IMCS	Missing availability status	11/17/92	01/21/93	III	Closed
050-R02	IMCS	Screen selection for LU 3E	11/14/92	06/15/93	III	Closed
051-R02	IMCS	Password change	11/13/92	06/15/93	II	Closed
052-R02	RMS/ MDT	MDT numerical read/write values	11/13/92	06/24/94	II	Closed
053-R02	RMS	Redundant data input required for LUID 2B3A	11/13/92	06/15/93	III	Closed
054-R02	RMS/ MDT	MDT input procedure	11/15/92	06/24/94	IV	Closed
055-R02	VS SIE 02	VS SIE 02 lost cal data on cold restart	11/15/92	01/21/93	II	Closed
056-R02	ALS SIE	ALS SIE lost cal after pwr down	11/13/92	01/21/93	II	Closed
057-R02	RMS	Clarify purpose of LU 23	11/13/92	06/24/94	III	Closed
058-R02	RMS	MDT Product-Edit Override-Fail screen	11/15/92	06/15/93	III	Closed
059-R02	RMS	MDT Product-Edit Override-Fail page #0	11/15/92	06/15/93	III	Closed

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
060-R02	RMS	RVR to MDT communication loss	11/15/92	06/15/93	II	Closed
061-R02	IMCS	MPS double RRs	11/10/92	12/10/93	IV	Closed
062-R02	RMS	RMS data stops and restarts	11/10/92	09/22/93	IV	Closed
063-R02	IMCS	MPS polls while RMS is sending data	11/10/92	12/10/93	IV	Closed
064-R02	MDT	Current LCD display of MDT inadequate	11/14/92	01/21/93	III	Closed
065-R02	IMCS	Old data in data base	11/15/92	01/21/93	IV	Closed
066-R03	RMS	RMS response to DISC while already in DM is UA vs DM	06/14/93	06/24/94	III	Closed
067-R03	IMCS	Wrong description is used for De-Ice Heater	06/14/93	09/22/93	IV	Closed
068-R03	RMS	Command error message for some commands is incorrect	06/14/93	06/24/94	III	Closed
069-R03	RMS	RMS incorrectly prioritizes first message	06/14/93	09/22/93	III	Closed
070-R03	RMS	Erroneous character at MDT while editing	06/15/93 (Retested 09/22/93, 12/06/93, 06/13/94)		IV	Open (Priority downgraded 9/22/93)

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
071-R03	IMCS	Data point description incorrect LU27 DP's 31, 32, 33, 34	06/15/93	09/23/93	III	Closed
072-R03	IMCS	Alarm indicated on wrong LUID	06/17/93	12/10/93	II	Closed
073-R03	IMCS	VS sensor failure & VS SIE fail stat not clear cons monit	06/18/93	09/22/93	III	Closed
074-R03	RMS	RMS resets itself with any command under conditions	06/17/93 (Retested 09/22/93, 12/09/93, 06/13/94)		II	Open (Priority upgraded 12/09/93)
075-R03	IMCS	LU 48 current sensor X has wrong point value	06/16/93	09/22/93	III	Closed
076-R03	RMS	Mismatch between the MPS and MDT fault LRU screens	06/22/93 (Retested 09/22/93, 12/10/93, 06/13/94)		IV	Open

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
077-R03	IMCS	Character remains on constant monitor	06/23/93	09/22/93	IV	Closed
078-R03	IMCS	Terminal messages are repeated	06/23/93	09/22/93	III	Closed
079-R03	IMCS	IMCS point description should be consistent	06/15/93	09/22/93	IV	Closed
080-R03	IMCS	Unexpected RMS/Comm Alert message	06/23/93	09/22/93	II	Closed
081-R03	IMCS	RVR decoder incorrectly identifies alarm messages	06/22/93	09/22/93	II	Closed
082-R05	RMS	IDD error, incorrect SIE LU number range	12/10/93	06/24/94	V	Closed
083-R05	RMS	Multiple state changes when user logs off at DPU	12/06/93 (Retested 06/13/94)		IV	Open
084-R05	RMS	Rate-of-Change DP was Temperature at MDT	12/06/93	06/24/94	IV	Closed
085-R06	RMS	Data Validity causes alarm but has no Alarm/RTN	06/17/94		III	Open
086-R06	RMS	VS and ALS Availability status does not always match MDT	06/17/94		III	Open

Summary of Test Trouble Reports
For NAS OT&E/Integration Testing
Of The RVR RMS
(continued)

TTR#	System	Description of Problem	Opened	Closed	Priority	Status
087-R06	RMS	DPU Power Supply test points for -5 and +12 vdc wrong	06/20/94		III	Open
088-R06	RMS	RVR Lost Calibration.	06/20/94		III	Open

Report No.	Project	Subsystem	Test Date	Create Date
008	RVR	RMS	2/24/92	3/24/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:

For VS SIE 01 Step 17 (Alarm) and Step 18 (Return-to-Normal)

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR FAILED TO INDICATE A BATTERY CONDITION ALARM

Detailed Description:

The RVR failed to indicate a battery condition alarm when discharged. The battery voltage in this case (measured with a Digital Multimeter) was 0.8Vdc. ANN-140 Representative indicated that this was due to the fact that a low battery condition would only be detected when the battery is the active power source, therefore, if a battery is completely discharged, the SIE will not be operational when the AC power is lost and cannot detect a low battery condition. Three of the batteries in the Kansas City RVR system were discharged, and this did not become apparent until the AC power was turned off at each SIE and the SIE became non-functional.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be modified to continuously monitor the battery voltage and provide an alarm when the battery voltage falls below a certain limit.

Follow-up Status

	Date:
1. To be a maint proc proposed by ANN-140. AOS-220 is in agreement Req verification of Proc.	01/21/93
2. Downgraded to Minor with AOS-220 procedure.	12/10/93

Closure Description:

_____
_____. __/__/__

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
018	RVR	RMS	2/24/92	3/30/92

Report By:	Test Sequence ID (Section 3.8.9)
C.Bolling/L.Armstrong	A6 - REMOTE CERTIFICATION TEST

Test Step Description:
Step 1

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
REMOTE CERTIFICATION PARAMETERS HAVE NOT BEEN IDENTIFIED

Detailed Description:

The parameters required for certification of the RVR have not been identified as required by NAS-SS-1000 Volume I, Appendix III, paragraph 3.1.1.14 .

Attachments _____
Test Engineer _____

Disposition Instructions:

Remote Certification parameters must be identified in the technician's handbook.

Follow-up Status

	Date:
1. Still open; ASM-620 will provide the necessary info.	. 08/19/92
2. Param defined. to be incorp in future	. 01/21/93

Closure Description:

_____
_____ . __/__/__

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
019	RVR	RMS/IMCS	2/24/92	3/30/92

Report By:	Test Sequence ID (Section 3.8.9)
C.Bolling/L.Armstrong	A6 - REMOTE CERTIFICATION TEST

Test Step Description:
Step 1

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR IMCS DECODER DOES NOT PROVIDE CERTIFICATION STATUS SCREEN

Detailed Description:

The RVR IMCS decoder module does not provide a site certification status screen or command. It would be a convenience to the site technician if all of the parameters required for certification were presented on one status screen and could be obtained by issuing one command. This change could be implemented in future revisions of the RVR IMCS decoder modules. The certification parameters must be defined before this can be accomplished.

Attachments _____
Test Engineer _____

Disposition Instructions:

A Remote Certification Status Screen and command should be added to the RVR IMCS decoder which will display the remote certification parameters. (See TTR 018)

Follow-up Status

	Date:
1. Still open; Unisys will operate IMCS module after ASM-620 provides parameters.	. 08/19/92
2. Param defined. to be incorp in future.	. 01/21/93

Closure Description:

_____
_____. __/__/__

Approved: FNL

Test Director _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 070 R03
TTR TITLE: Erroneous character at MDT while editing	TTR PRIORITY: Annoyance IV
ORIGINATOR: Jeffrey Henderson	OBSERVED: 06/15/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified-R08.04
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Useability

REFERENCE: N/A
REV/VOL None PAGE ____ PARA _____

TEST SEQUENCE: ID None STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

While changing the screen update rate (editing mode), the MDT screen placed erroneous characters in the field.

FOLLOW-UP STATUS: DATE
1. Priority downgraded to Annoyance 09 /23 /93
__ /__ /__

CLOSURE DESCRIPTION:
__ /__ /__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 074 R03
TTR TITLE: RMS resets itself with any command under conditions	TTR PRIORITY: MAJOR II
ORIGINATOR: Ray Haines	OBSERVED: 06/17/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Usability

REFERENCE: NAS-SS-1000
REV/VOL V PAGE ____ PARA 3.2.1.1.2.2.7

TEST SEQUENCE: ID A4 STEP 1 PAGE 114

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

During testing, the RMS would reset itself when it received a second command. It did this with Site Status, Global Status, and Fault Diagnostics. The sequence of events was

1. the RMS did not act on the first command,
2. the RMS reset itself when it received the second command, and
3. the RMS acted on the command after the reset. The RMS continued to operate as expected when it received any additional commands.

This sequence may be related to the RMS/Comm Alert - NORMAL which appears in the DBH file. It preceded each of these sequences.

FOLLOW-UP STATUS: DATE
1. MPU is reset in step 2 not entire RMS. 09 /23 /93
2. Upgraded to major due to lack of messages. 12 /09 /93

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 076 R03
TTR TITLE: Mismatch between the MPS and MDT fault LRU screens	TTR PRIORITY: Annoyance IV
ORIGINATOR: Jeffrey Henderson	OBSERVED: 06/22/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified-R08.04
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-SS-1000
REV/VOL ____ PAGE ____ PARA _____

TEST SEQUENCE: ID Cat.B4 STEP 1-7 PAGE 120

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

After creating a fault at the RLIM, ran diagnostics at the MDT and the MPS. The MDT screen indicated 3 possible fault LRU's (Personality Module, Controller, and cable). The MPS indicated the "RLIM_SIE_PM_LRU" and the "SIE_CRTL_LRU" as faults.

See screen printout for MDT.

FOLLOW-UP STATUS: DATE

1. Problem does not exist at other SIE's. RLIM has been unchanged since 11/06/92. 12 /06 /93

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

A-17

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 083-R05
TTR TITLE: Multiple State Changes When User Logs Off At DPU	TTR PRIORITY: IV ANNOYANCE
ORIGINATOR: Ray Haines	OBSERVED: 12/06/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-SS-1000 Volume V
REV/VOL V PAGE -- PARA 3.2.1.1.4.2.7

TEST SEQUENCE: ID --- STEP --- PAGE ---

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When the user logged off from the DPU, there were additional unexplained log off state change messages from data point LUI 2120 (MDT Log on Status of the Terminal Communications LU). The number appeared to be related to the security level that the user logged on at, but the specific relationship could not be determined. The message was not related to any reset of the MPU or other communication problem. Sometimes, the messages came in a group of two or three. Sometimes, one of the messages came minutes after the previous log off message. Only one log off message was expected each time the local terminal timed out or the user logged off.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 085-R06
TTR TITLE: Data Validity causes alarm but has no Alarm/RTN	TTR PRIORITY: III MINOR
ORIGINATOR: Hari Lall/Ray Haines	OBSERVED: 06/17/94
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: Interface Design Document (May 17, 1994) REV/VOL H PAGE 47,50,53 PARA Tables XIV-XVII	
TEST SEQUENCE: ID Cat A3 STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The Data Validity data point used on the VS, ALS, and RLIM has an allowable condition status of Alarm but does not issue alarm/RTN messages. When the Data Coast Fail data point alarms, the condition status of the Data Validity was alarm. If a site status is requested when Data Validity has an alarm condition, an alarm will be presented at the IMCS Constant Monitor screen. Data Validity has no RTN to clear the alarm from the constant monitor. The work around for this problem is to send a request for site status from the MPS. The site data report would contain a normal status for Data Validity. The normal status will remove the alarm from the Constant Monitor screen

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 086-R06
TTR TITLE: VS and ALS Availability status does not always match MDT	TTR PRIORITY: III MINOR
ORIGINATOR: Ray Haines	OBSERVED: 06/17/94
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: Interface Design Document (May 17, 1994)
REV/VOL H PAGE 47,50,53 PARA Tables XIV-XVII

TEST SEQUENCE: ID Cat A4 STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The availability status of the VS and ALS at the MPS did not always match the status at the MDT. When the VS or ALS are Offline and a Unit Reset command is sent from the MPS, the availability status at the MPS is updated to show that the unit is "Online Auto (restart)". This is the expected response. The MDT indicates that the unit is still "Offline by MPS" or "Offline by operator". Analysis indicated that the MDT was giving the correct information for the availability status. The work around for this problem is to request a site status after a Unit Reset command is sent from the MPS.

This problem was identified on the VS SIE and ALS SIE units. The problem did not exist on the RLIM SIE.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __/__/__

_____ __/__/__

CLOSURE DESCRIPTION:

_____ __/__/__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 087-R07
TTR TITLE: DPU Power Supply test points for -5 and +12 Vdc wrong	TTR PRIORITY: III MINOR
ORIGINATOR: Ray Haines	OBSERVED: 06/20/94
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: TI 6560.17 RVR On-Site Requirements Instruction Bk
REV/VOL ____ PAGE _____ PARA _____

TEST SEQUENCE: ID Cat A3 STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The test points for -5 vdc and +12 vdc did not indicate the expected voltages when a digital voltmeter was connected to them. The +12 vdc test points indicated about +12 vdc but when the voltage was varied to induce alarm conditions, the value at the test points did not vary. The MDT was used to determine the actual value as the voltage was varied. The -5 vdc test points had the same problem. The +5 and -12 vdc test points did not have this problem.

The work around for this problem is to use the MDT values or connect the digital voltmeter directly to the CCA. However, the value at the MDT reads every few tenths of a volt (about 0.04 vdc variations). Also, the value at the MDT varied from -11.89 to -12.18 without any variation in adjustment for the -12 vdc power supply reading.
(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE
_____ __/__/__
_____ __/__/__

CLOSURE DESCRIPTION:
_____ __/__/__

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 088-R07
TTR TITLE: RVR Lost Calibration	TTR PRIORITY: V OTHER
ORIGINATOR: Ray Haines	OBSERVED: 06/20/94
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Useability

REFERENCE:
REV/VOL ____ PAGE _____ PARA _____

TEST SEQUENCE: ID Cat B1 STEP 15 PAGE 174

TTR ORIGIN: Test	PROBLEM REPRODUCED? NO If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When the ALS goes out of calibration, it should provide Loss of Calibration indication through alarm message or diagnostic results.

When full offline diagnostics were commanded from the MPS, the results indicated SIE Enclosure as first likely. When a MDT was connected to the DPU, no LRU failure was identified. The diagnostics results displayed on the MDT did not agree with the results at the MPS. The MPS showed Data Coast Fail (LU ID 3A 2A) alarm. When the ALS was commanded Online from the MPS, it went online but the CD displayed incorrect visibility conditions ("0000"). Further investigation of this problem revealed that the ALS was out of calibration.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

_____ __ /__ /__

APPROVED:
TEST DIRECTOR _____

Additional Description for TTR-088

PROJECT: RVR
TTR #: 088-R06
TTR TITLE: RVR Lost Calibration
TTR PRIORITY: V (OTHER)
OBSERVED: 06/20/94

The Ambient Light Sensor (ALS) Sensor Interface Electronics (SIE) had a problem during testing. While testing the MDT at the Data Processing Unit (DPU) in sequence Cat B1, the ALS failed. Prior to the MDT test, the ALS was tested and was operating normally. After the MDT test, the ALS was examined. The ALS initially indicated that the first likely Lowest Replaceable Unit (LRU) was the SIE Enclosure LRU. This indication was the result of automatic online diagnostics from the RMS and full offline diagnostics which were commanded from IMCS. When a Maintenance Data Terminal (MDT) was connected to the ALS MDT port, no trouble was found and there were no LRU's identified. After running full offline diagnostics by an IMCS command, the ALS was offline by automatically detected fault and the Controller Display (CD) showed "FFFF". The only two alarms present were Data Coast Fail (LUID 3A2A) and ALS Data Validity (LUID 3A2F). When the ALS was commanded online by the MPS, it went online but the CD displayed "0000" unless the runway lights were on. When the runway lights are on, the CD displays visibility according to night conditions. This ALS problem needs to be corrected. Further investigation of this problem revealed that the ALS had lost it's calibration.

ATTACHMENT B

RVR RMS INTEGRATION TEST

CLOSED

TEST TROUBLE REPORTS (TTR's)

For June 13-24, 1994

NAS OT&E Integration Retest

Test Trouble Report Forms

This appendix contains completed Test Trouble Report (TTR) forms for the National Airspace System (NAS) Operational Test and Evaluation (OT&E)/Integration testing of the Runway Visual Range (RVR) Remote Monitoring Subsystem (RMS). The purpose of these forms is to highlight the troubles identified during the test and analysis process. The TTR's also are intended to provide further information whenever appropriate.

Two types of TTR forms are found in this appendix. The forms used during this retest were modified to add more detail than the original forms. A brief description of each field of the TTR form is provided here.

ACN-100 RMS Test Trouble Report (TTR)
Descriptions of Test Trouble Report Form Fields
For the "New" TTR Form

TTR's with an "R" following the TTR number were found during a retest. The retest number is added to the right of the "R" so that this information can be easily viewed.

1. PROJECT - This is used to designate the specific project to which the TTR is related.

2. TTR# - This is the unique report number.

3. TTR TITLE - This entry is a unique brief description of the problem.

4. TTR PRIORITY - The priority of the TTR is directly related to the failure category. The classification for problem reporting is based on classification by priority as defined in Appendix C (Section 10.3) of the specification document DOD-STD-2167A Defense System Software Development. The description found for each classification in the document are paraphrased below:

a. I Critical. (Priority 1) - A software problem that does one of the following:

(1) Prevents the accomplishment of an operational or mission essential capability specified by baselined requirements

(2) Prevents the operator's accomplishment of an operational o mission capability

(3) Jeopardizes personnel safety.

b. II Major. (Priority 2) - A software problem that does one of the following:

(1) Adversely affects the accomplishment of an operational or mission essential capability specified by baselined requirements so as to degrade performance and for which no alternative work-around solution is known

(2) Adversely affects the operator's accomplishment of an operational or mission capability specified by baselined requirements so as to degrade performance and for which no alternative work-around solution is known.

c. III Minor. (Priority 3) - A software problem that does one of the following:

(1) Adversely affects the accomplishment of an operational or mission essential capability specified by baselined requirements so as to degrade performance and for which an alternative work-around solution is known

(2) Adversely affects the operator's accomplishment of an operational or mission essential capability specified by baselined requirements so as to degrade performance and for which an alternative work-around solution is known.

d. IV Annoyance. (Priority 4) A software problem that is an operator inconvenience or annoyance and which does not effect a required operational or mission essential capability.

e. V Other. (Priority 5) - All other errors.

5. ORIGINATOR - This is the name of the person who discovered the problem.

6. OBSERVED - This field is for the date when the problem was discovered.

7. MPS LOCATION - Geographical location of the MPS.

8. RMS LOCATION - Geographical location of the RMS.

9. TEST TOOLS - Software and hardware tools in use when the problem was discovered.

10. PATHWAY - Indicates if the MPS is "INTEGRATED" with the site software, or if it is running independent or "SEPARATE" from the operational system.

Descriptions of Test Trouble Report Form Fields
For the "New" TTR Form
(continued)

11. MMS/IMCS - Indicates that the IMCS is accessed through the MMS screens.

12. OP SYS - The version of the Tandem Guardian Operating system which is running the IMCS/MMS or TESTCOM software is entered here.

13. MMS/IMCS VER - Two entries are in this field. First, the version of MMS running on the Tandem (if running the Married Version) is entered here. Next, after the back slash divider, the version of IMCS running on the Tandem (assuming testing does not use TESTCOM) is entered.

14. SUB-SYSTEM FAILURE - Subsystem that the TTR is written against.

15. CATEGORY OF FAILURE - Indicates whether the problem was directly related to a requirement or if it is a usability issue where no requirement can be quoted.

16. REFERENCE - The document and the specification which was violated at the time of failure.

17. TEST SEQUENCE - Indicates the test ID (ie. IT1), test step and the page of the test procedures that the TTR can be traced to or that will allow duplication.

18. TTR ORIGIN - Indicates the stage of testing where this failure was discovered.

19. PROBLEM REPROD. - This field indicates any recreation attempts on the problem. Also, it notes if the MPS system was having unique problems at the time of the noted failure.

20. PROBLEM DESCRIPTION & DUPLICATION PROCEDURE - This section details exactly how to recreate the error observed during testing. All relevant information is attached to the TTR.

21. FOLLOW-UP STATUS - This section is usually left blank for test reporting. It is used to track and document the TTR status.

Report No.	Project	Subsystem	Test Date	Create Date
001	RVR	RMS	2/24/92	3/20/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

All Steps 1-34

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RMS ALLOWS STATUS COMMANDS FROM MPS WHEN IN LOCAL CONTROL MODE

Detailed Description:

It is possible to send status commands (scheduled and specific polls) to the RVR via the MPS while the RVR is under local control. Paragraph 3.4.3 of NAS-MD-793 states: "If the RMS is in local control mode when a command comes from an MPS, the command shall not be executed and a command denial message shall be formatted for up-line transmission."

The fault diagnostic commands perform this action properly. When a fault diagnostic command is received while the RVR is under local control, a Busy Status message with an ASCII data field of "LOCL" is returned.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be modified to return this same message for all commands while under local control.

Follow-up Status

	Date:
1. Re-tested (16:57:59).	08/18/92
2. _____	__/__/__

Closure Description:
TTR corrected.
_____ 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
002	RVR	IMCS	2/24/92	3/20/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

Steps 9 and 10

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR IMCS STATUS SCREEN TYPOGRAPHIC ERROR (DP 3C IN LU's 28-33)

Detailed Description:

The status screen descriptive text for Data Point (DP) 3C of Logical Units (LU's) 28 through 33 (VS SIE's) reads "VS TX Wing Contam", this should read "VS TX Wind Contam".

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR IMCS decoder module should be modified to correct the descriptive text for DP 3C for all VS SIE status screens.

Follow-up Status

	Date:
1. Re-tested.	08/18/92
2. _____	__/__/__

Closure Description:
Status screen corrected.
_____ 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
003	RVR	RMS/IMCS	2/24/92	3/23/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

Step 4

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RMS SITE ADDRESS SHOULD BE HEXADECIMAL FORMAT AND ODD

Detailed Description:

The MPS displays the site address on the Communications status screen (LUDP 2320) and the RVR Site Constants status screen (LUDP 3D20) in decimal form. The DPU MDT displays the site address in hexadecimal form. Paragraph 3.2 of NAS-MD-790 states: "RMS addresses shall consist of a single byte ranging from hex 21 through hex FD with the least significant bit always equal to 1." Additionally, the decimal format for a site address is never used. This leads to confusion during testing.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR IMCS decoder module should be modified to display the site address in hexadecimal format.

Follow-up Status

	Date:
1. Re-tested.	08/18/92
2. _____	__/__/__

Closure Description:

TTR Corrected.	08/18/92
_____	__/__/__

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
004	RVR	IMCS	2/24/92	3/23/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

Step 16

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR IMCS STATUS SCREEN TYPOGRAPHIC ERROR (DP 3F IN LU's 28-33)

Detailed Description:

The status screen descriptive text for DP 3F of LU's 28 through 33 (VS SIE's) reads "VS RX Wing Contam", this should read "VS RX Wind Contam."

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR IMCS decoder module should be modified to correct the descriptive text for DP 3F for all VS SIE status screens.

Follow-up Status

	Date:
1. Re-tested.	08/18/92
2. _____	__/__/__

Closure Description:
TTR corrected.
_____ . 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
005	RVR	RMS	2/24/92	3/23/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

Step 5

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RUNWAY LIGHTING CONSISTENCY STATUS NOT AVAILABLE AT MDT

Detailed Description:

Runway Lighting Consistency Status (LU 24) values were not found at the DPU MDT. The RVR DPU should be modified to display the information contained in LU 24. If this information is not required for remote monitoring, then it should eliminated from the RVR IMCS decoder module and the RVR ICD.

Attachments _____
Test Engineer _____

Disposition Instructions:

If this information is not required for Remote Monitoring then it should be eliminated from the RVR IMCS Decoder module and the RVR ICD.

Follow-up Status

	Date:
1. Re-tested.	. 08/18/92
	. __/__/__

Closure Description:

Program office determined LU was not relevant to MPS therefore it was removed from ICD. . 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
006	RVR	RMS	2/24/92	3/24/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A2 - Monitoring Test (Section 3.8.5)

Test Step Description:

Step 4

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RLIM LINK ERROR VALUE NOT AVAILABLE AT THE MDT

Detailed Description:

Values for VS SIE Link Errors (LUDP's 2321 - 232C), ALS SIE Link Error (LUDP 232D), and RLIM SIE Link Errors (LUDP's 232E - 2339) were not found at the DPU MDT. The RVR DPU should be modified to display the information contained in the noted DP's. If this information is not required for remote monitoring, then it should be eliminated from the RVR IMCS decoder module and the RVR ICD.

Attachments _____
Test Engineer _____

Disposition Instructions:

If this information is not required for Remote Monitoring then it should be eliminated from the RVR IMCS Decoder module and the RVR ICD.

Follow-up Status

	Date:
1. Re-tested.	08/18/92
2. _____	__/__/__

Closure Description:

TTR closed. Values for ALS, SIE, RLIM were noted. 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
007	RVR	RMS	2/24/92	3/24/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:

Step 9 (Alarm) and Step 10 (Return-to-Normal)

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR DOES NOT WORK WITH DEAD OR DISCONNECTED BATTERY

Detailed Description:

After disabling the MPU battery, and restoring AC power, the RVR did not respond to MPS polls. Re-enabled link by sending a fault diagnostic command from the MDT. After re-enabling the MPU battery, communications were not restored with the MPS. Sent a fault diagnostic command from the MDT to restore the system.

Attachments _____
Test Engineer _____

Disposition Instructions:

The cause of this problem should be determined and corrective action taken to prevent the RVR from becoming non-operational when the MPU battery is dead or disabled.

Follow-up Status

	Date:
1. The RVR did not respond to polls after disconnection of battery and restoration of ac power.	08/19/92
	__/__/__

Closure Description:
MPS and RVR communication restored. 11/10/92
_____ __/__/__

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
009	RVR	RMS/IMCS	2/24/92	3/25/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:

Similar to Step 19 and 20 but using ALS SIE

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
LOSS OF AC POWER SHOULD BE A HARD ALARM

Detailed Description:

Removal of AC power from the ALS SIE (with a fully charged battery) resulted in "WARNED HIGH" being displayed at the DPU MDT and "Soft alarm,high" being displayed at the MPS. The RVR ICD indicates "Soft alarm if fail" for LU 34 DP 35. Low or complete loss of AC power should be a hard alarm, not a soft alarm, and loss of AC power should not return a "high" description.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR IMCS decoder module, and the RVR ICD should be modified to report faulty AC power as a hard alarm with a "low" description.

Follow-up Status

	Date:
1. Re-tested.	08/19/92
2.	__/__/__

Closure Description:
MPS reported alarm as "Hard Alarm High".
MDT reported alarm as "Hard Alarm". TTR Closed. 08/19/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
010	RVR	RMS/IMCS	2/24/92	3/25/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:
PPU A: Step 11 (Alarm) and Step 12 (Return-to-Normal)
PPU B: Step 13 (Alarm) and Step 14 (Return-to-Normal)

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
DISABLING THE BATTERY RESULTED IN ALARMED HIGH WITH LOW VALUE

Detailed Description:

Disabling the battery in PPU A resulted in "ALARMED_HIGH" being displayed at the DPU MDT and "Hard alarm,high" being displayed at the MPS. The same results were obtained with PPU B. A low or nonexistent battery voltage should return a "low" description. The RVR and the RVR IMCS decoder module should be modified to provide a "low" description for a low PPU battery condition.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR and the RVR IMCS decoder module should be modified to provide a "low" description for a low PPU battery condition.

Follow-up Status

	Date:
1. Re-tested, still open until verification can be made of what the RVR should display.	08/19/92

Closure Description:
Status condition changed to hard alarm low. 11/10/92
_____. __/__/__

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
011	RVR	RMS/IMCS	2/24/92	3/25/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:
Step 21 (Alarm) and Step 22 (Return-to-Normal)

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
VALUE DISPLAYED ON IMCS SCREEN DOES NOT ALWAYS REPRESENT CURRENT OR TYPICAL VALUE

Detailed Description:

After creating and clearing a VS TX window contamination alarm on VS 03, it was noted that the value for TX window contamination at the MPS (LUDP 2A3C) was 9.5% while the value displayed at the DPU MDT was 0.5%. Data analysis has revealed that when the VS TX window contamination dropped below 10% (the alarm threshold), the RVR sent a Return to Normal message with the current value (9.5%). No other messages for this data point were received after that, even though the VS TX window contamination continued down to 0.5%. It was necessary to manually request a status of VS SIE 03 to display the current value at the MPS.

Attachments _____
Test Engineer _____

Disposition Instructions:
Because the MPS does not monitor the RMS in Real Time, the Site Technician must request a Site Status to determine the current value. The value sent to the MPS in the Return-to-normal message is only a transitional value.

Follow-up Status

	Date:
1. Re-tested.	. 08/19/92
2. _____	. __/__/__

Closure Description:
System performing properly.
TTR closed. . 08/19/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
012	RVR	RMS	2/24/92	3/26/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A3 - Alarm Test (Section 3.8.6)

Test Step Description:
Steps 1 through 8

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
NO HARD ALARM THRESHOLD VALUES FOR DPU DC POWER SUPPLIES

Detailed Description:

There are no hard alarm threshold values for the DPU power supplies (+/-5V, +/-12V). Paragraph 3.2.1.1 of NAS-MD-793 states: "For each alarm related equipment parameter, which has other than an on/off state, a separate set of threshold values shall be stored in the RMS's memory for determining hard alarm and soft alarm conditions." The RVR should be modified to hard alarm thresholds for each power supply value.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be modified to provide both a hard alarm and a soft alarm threshold for each power supply value.

Follow-up Status

	Date:
1. Re-tested. Problem still exists.	. 08/19/92
	. __/__/__

Closure Description:
Re-defined and closed. Refer to new TTR 025-R01. _____
_____ . 08/19/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
013	RVR	RMS	2/24/92	3/26/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A4 - COMMAND TEST (Section 3.8.7)

Test Step Description:
Steps 8 through 20

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RMS ALLOWS EQUIPMENT CONTROL COMMANDS FROM MPS WHEN IN LOCAL CONTROL MODE

Detailed Description:

It is possible to send equipment control commands to the RVR via the MPS while the RVR is under local control. Paragraph 3.4.3 of NAS-MD-793 states: "If the RMS is in local control mode when a command comes from an MPS, the command shall not be executed and a command denial message shall be formatted for up-line transmission."
The fault diagnostic commands perform this action properly. When a fault diagnostic command is received while the RVR is under local control, a Busy Status message with an ASCII data field of "LOCL" is returned. This is a correct response. The RVR should be modified to return this same message for all commands while under local control.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be modified to return a busy status message with an ASCII data field of "LOCL."

Follow-up Status

	Date:
1. Retested.	. 08/18/92
	. __/__/__

Closure Description:
In local mode, commands from MPS are not executed, a busy status message is sent. TTR closed. 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
014	RVR	RMS/IMCS	2/24/92	3/26/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A4 - COMMAND TEST (Section 3.8.7)

Test Step Description:
Steps 33 through 38

Category of Failure (circle one)	I critical	II major	**III minor**	IV annoyance	V other

Brief Description:
VALID ARCHIVE DATA RETRIEVAL COMMAND RESULTS IN COMMAND ERROR THAT IS NOT DISPLAYED AT MPS

Detailed Description:

While under local control, archive data retrieval commands result in a Command Error message being returned in response to the command. The MPS gives no indication to the user that this has occurred. The RVR should be modified to respond to a command, while under local control, with a Busy Status message as indicated in above. Additionally, the IMCS should be modified to display to user that the command sent has been rejected.

Attachments _____
Test Engineer _____

Disposition Instructions:
The RVR should be modified to respond to a command, while under local control, with a Busy Status message. The MPS should be modified to notify the user that the command sent has been rejected.

Follow-up Status

	Date:
1. Re-tested (20:05:00).	08/18/92
	__/__/__

Closure Description:
Change noted.
TTR corrected. 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
015	RVR	RMS	2/24/92	3/27/92

Report By:	Test Sequence ID
C.Bolling/L.Armstrong	A4 - COMMAND TEST (Section 3.8.7)

Test Step Description:
Steps 2 through 4

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR STOPPED RESPONDING AFTER MASTER RESET COMMAND

Detailed Description:

After manually switching the on line PPU via the switch on the front panel, the RVR stopped responding to the MPS polls. It was necessary to perform a fault diagnostic on the MPU, via the MDT, to re-establish communication. The RVR should be modified to automatically resume communication after performing a reset or an active PPU switchover.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be modified to automatically resume communication after performing a reset or a active PPU switchover.

Follow-up Status

		Date:
1.	Re-tested (20:26:00). Still open.	08/18/92
2.		__/__/__

Closure Description:
Combined with new TTR # 026-R01.
09/15/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
016	RVR	RMS	2/24/92	3/27/92

Report By:	Test Sequence ID (Section 3.8.8)
C.Bolling/L.Armstrong	A5 - DIAGNOSTIC COMMAND TEST

Test Step Description:
Fault #1 Steps 1 through 4

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
NO SITE DATA REPORT AFTER FAULT DIAGNOSTICS COMMAND

Detailed Description:

After initiating fault diagnostics on the MPU from the MPS, the RVR did not return a site data report for the MPU LU as indicated in paragraph 3.1.3.1.7 of the RVR ICD. The RVR should be modified to return a site data report after completion of any fault diagnostics.

Attachments _____
Test Engineer _____

Disposition Instructions:

The RVR should be corrected to return a site data report after completion of any fault diagnostics.

Follow-up Status

	Date:
1. Re-tested.	08/18/92
2. _____	__/__/__

Closure Description:
SDR sent from RVR RMS.
TTR corrected. . 08/18/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
017	RVR	RMS	2/24/92	3/27/92

Report By:	Test Sequence ID (Section 3.8.8)
C.Bolling/L.Armstrong	A5 - DIAGNOSTIC COMMAND TEST

Test Step Description:
Fault #3 Steps 1 through 6

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:
RVR REJECTS VALID FAULT DIAGNOSTIC COMMANDS FROM MPS

Detailed Description:

After sending a fault diagnostic command, from the MPS, to ALS SIE 03, with a value of 255, the RVR returned a command error message. The command was repeated with the same results. The command string was verified to be valid on the protocol analyzer. The cause of this problem should be determined and corrective action taken to ensure that the RVR does not reject a valid command. Also, problem exists on ALS, VS and RLIM.

Attachments _____
Test Engineer _____

Disposition Instructions:

The cause of this problem should be determined and corrective action taken to ensure that the RVR does not reject a valid command.

Follow-up Status

	Date:
1. Re-tested, problem still exists.	08/18/92
2.	__/__/__

Closure Description:
Re-defined and closed. Refer to new TTR # 037-R01.
08/21/92

Approved: FNL

Test Director _____

Report No.	Project	Subsystem	Test Date	Create Date
020	RVR	IMCS	2/24/92	3/30/92

Report By:	Test Sequence ID (Section 3.8.7.4)
C.Bolling/L.Armstrong	A4 - COMMAND TEST

Test Step Description:
Steps 21 through 32

Category of Failure (circle one)	I critical	II major	III minor	IV annoyance	V other

Brief Description:

IMCS THRESHOLD CHANGE PARAMETERS DO NOT AGREE

Detailed Description:

The IMCS threshold change parameter screen indicates a valid range of 1-255. The RVR ICD indicates valid ranges of 0-255 for all thresholds. This problem was identified for the MPU (LU 25), VS SIE's (LU's 28-33) and ALS SIE (LU 34).

Attachments _____
Test Engineer _____

Disposition Instructions:

A RVR IMCS decoder module should be modified to indicate a valid range of 0-255.

Follow-up Status

	Date:
1. Re-tested.	. 08/19/92
	. __/__/__

Closure Description:
IMCS decoder module modified.
_____. 08/19/92

Approved: FNL

Test Director _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 021-R01
TTR TITLE: LU 0X20 DP FF does not exist in RVR ICD	TTR PRIORITY: Minor III
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/18/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: IMCS REV/VOL _____ PAGE __ PARA _____	
TEST SEQUENCE: ID N/A STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The designation LUID 20FF is displayed when there is a communication problem between the MPS and the RVR. Their designation does not exist in the RVR. Note should be made to explain what and where this is generated.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Defined in CPFS spec. 11 /10 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 022-R01
TTR TITLE: Not all State Change messages displayed on 25th line	TTR PRIORITY: Minor III
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/18/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL _V__ PAGE _14_ PARA 3.2.1.1.2.2.4____	
TEST SEQUENCE: ID _A4__ STEP _____ PAGE _____	
TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Equipment Control command did not display the expected State Change message on the screen of the SMCC Terminal 25th line. Although it is not possible to record the SMCC Terminal 25th line, the State Change message is recorded into the history file. Data into the history file was recorded for approximately 4.5 minutes and no other event occurred during this time to overwrite the SMCC 25th line.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Defined in CPFS spec. 11 /10 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 023-R01
TTR TITLE: IMCS cmd parameter values not in expected units	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/18/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 - IMCS
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Useability

REFERENCE: None
REV/VOL ____ PAGE ____ PARA _____

TEST SEQUENCE: ID A4 STEP 23 PAGE 100

TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The IMCS command screen parameter values to be selected should be clearly defined.

Example: LU 0X25 D.P. 2B. The values listed on the command parameter screen are 475... 524. It should be clearly defined this value is 4.75 to 5.24.

	DATE
FOLLOW-UP STATUS: ANA-120 specifies to be corrected in R08.04	01 /21 /93
Priority downgraded to annoyance.	09 /22 /93
CLOSURE DESCRIPTION: Transferred to IMCS Hot Line for tracking.	12 /10 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 024-R01
TTR TITLE: RTN for LU 26 and LU 27 do not agree with ICD	TTR PRIORITY: Major II
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/18/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 17 PARA 3.4.2

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Some Return to Normal (RTN) monitored message value data are not defined. Example: LUID 262F, 2630 and LUID 272F, 2730. RTN messages are as follows:

LU 0X26	21	12	26	00	42	2F	41	00	01	59
	21	04	26	00	42	30	41	00	01	C8
LU 0X27	21	0A	27	00	42	2F	41	00	01	48
	21	1C	27	00	42	30	41	00	01	D9

IMCS did not indicate this is undefined data. Status values should be per LU. Note: Per Table V.

FOLLOW-UP STATUS:	DATE
Return in IDD to be changed to RTN.	11 /10 /92
CLOSURE DESCRIPTION:	
IDD LU notes updated.	11 /17 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 025-R01
TTR TITLE: No hard alarm capability	TTR PRIORITY: Major II
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/19/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 3.2.1.1.4.1.11 REV/VOL V PAGE 19 PARA 3.2.1.1.4.1.7	
TEST SEQUENCE: ID A3 STEP _____ PAGE _____	
TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

All power sources are critical subassemblies and their failure is to be reported immediately so corrective action can be taken. A soft alarm indicates a non-critical situation that requires action at a future time. A hard alarm is a critical failure and demands immediate corrective action. All alarms are to be reported and displayed on any communication path to the RMS.

(Formerly TTR #012)

FOLLOW-UP STATUS:	DATE
Written verification of P.S. failure required.	11 /10 /92
CLOSURE DESCRIPTION:	
Fixed hard alarm thresholds were added to the DPU. Tested capability and not trouble found.	06 /24 /94

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 026-R01
TTR TITLE: Recovery from comm failure requires Fault Diag Cmd	TTR PRIORITY: Critical I
ORIGINATOR: D. Fields	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 46 PARA 4.5

TEST SEQUENCE: ID A4 STEP 6 PAGE 97

TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When communication fails, communication can not be re-established without executing a fault diagnostics from the MDT. Example: after sending a Master Reset command, refer to (TTR #15), the communication link failed. RVR RMS did not respond to Set Normal Response Mode (SNRM) from the MPS. The same problem occurred after sending a Start-Up Recovery command.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Normal comm link re-established. 11 /10 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 027-R01
TTR TITLE: No indication at MDT with ALS SIE Controller Fault	TTR PRIORITY: Major II
ORIGINATOR: D. Fields	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-793
REV/VOL 1986 PAGE 18 PARA 3.3.5

TEST SEQUENCE: ID A5 STEP 1-6 PAGE 106

TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When the ALS faulted controller board was installed, it was not possible to log on the ALS SIE with the MDT to perform a Fault Diagnostic. Later investigation found that the Fault inserted on the board prevented Fault Diagnostics. This step could not be tested with this particular fault on this board.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Could not be tested with this fault inserted. 09 /23 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 028-R01
TTR TITLE: Threshold values differ between MPS and MDT	TTR PRIORITY: Minor III
ORIGINATOR: M. Jones	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS/IMCS	CATEGORY OF FAILURE: Requirement

REFERENCE: ICD
REV/VOL E PAGE 42 PARA _____

TEST SEQUENCE: ID A4 STEP 21 PAGE 100

TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

LU ID (2523) Threshold on the DPU did not match the threshold
LU ID (2523) on MPS.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Back-up documentation not conclusive. 10 /05 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 029-R01
TTR TITLE: General Comment on Scale Factors	TTR PRIORITY: Major II
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: ICD
REV/VOL 11/16/92 PAGE ____ PARA Appendix I

TEST SEQUENCE: ID A4 STEP 31 PAGE 101

TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

There are many scaling factors that need to be reviewed and updated (approximately 30). Some IMCS parameter input command values sent and value displayed on LU status screens do not always agree. Example: LU 0X34 data point 38. IMCS parameter value sent was 433. Value displayed on IMCS status screen was 43.5. Note 9 of ICD is: interface range of 0 to 1275 in units of .1%. RVR internal units are .5%. The updated values need to be put into a users format. The user should not be required to include the RVR factor and the input factor to arrive at a parameter unit. Example: LU 0X3D Note 4 of the ICD, interface range of 0 to 1275 in units of 1/km. RVR internal units of 5/km. This should read: interface range of 0-1275 in units of 5/km. No RVR internal units is now required. References should always be from the users side. IMCS screens also need to track updates.

FOLLOW-UP STATUS: DATE
LU 3D Note 8 in error (11/17/92 draft IDD) 01 /21 /93

CLOSURE DESCRIPTION:
RMS and MPS now have same scaling factor. No diff. 06 /24 /94

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 030-R01
TTR TITLE: Terminal Message should not display on 25th line	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 - IMCS
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL _V__ PAGE _21_ PARA _3.2.1.1.4.1.30__	
TEST SEQUENCE: ID _None STEP _____ PAGE _____	
TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Terminal messages from the RMS site appear on the ARTCC SMCC terminal on the 25th line. The 25th line is limited to approx. 40 characters and all beyond that point are truncated and will never be displayed. Also, the 25th line is for priority type messages.

FOLLOW-UP STATUS: ANA-120 specifies to be corrected in release of RO8.04	DATE 01 /20 /93
CLOSURE DESCRIPTION: Terminal messages are displayed on a separate split screen. Notice of message is on constant monitor.	06 /22 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 031-R01
TTR TITLE: RMS doesn't display on-line/off-line status	TTR PRIORITY: Minor III
ORIGINATOR: M. Jones	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Useability

REFERENCE: ICD
REV/VOL E PAGE 48 PARA _____

TEST SEQUENCE: ID A4 STEP 50 PAGE 103

TTR ORIGIN: Testing	PROBLEM REPRODUCED? No If NO, was the MPS log consulted? Yes

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The LUID control status was not shown at the MDT when a unit reset was performed on LUID 2820. The LU indicated it was off-line at the MPS for approximately 2 minutes then came back on-line. While visually monitoring the MDT during this 2 minute time period, the MDT did not display the control status as off-line.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Condition satisfied. 11 /10 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 032-R01
TTR TITLE: MPS failed to send commands unless RMS message 1st	TTR PRIORITY: Critical II
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL _V__ PAGE _15_ PARA _3.2.1.1.2.2.6___	
TEST SEQUENCE: ID _A4__ STEP _____ PAGE _____	
TTR ORIGIN: Testing	PROBLEM REPRODUCED? No If NO, was the MPS log consulted? Yes

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The MPS failed to send IMCS commands when requested by IMCS. However, after the MDT sent a command to the RMS and a priority message was sent from the RMS to the MPS, IMCS was again able to send commands. During the time MPS was not sending IMCS commands, continuous polls were being sent by the MPS to the RMS.

FOLLOW-UP STATUS:	DATE
Tandem redesigning driver ANA-120 specifies S.W. solution in proc (temp)	01 /21 /93
CLOSURE DESCRIPTION:	
Could not be duplicated in Sept. 93 retest	06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 033-R01
TTR TITLE: Command Error message incomplete - not entire message	TTR PRIORITY: Major III
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 21 PARA 3.5.2

TEST SEQUENCE: ID A4 STEP ____ PAGE ____

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Command Error message sent from RMS to MPS is incorrect.
Examples:

```
Command message sent:  21 90 28 00 48 24 3E 00 00
Expected response:     21 38 20 00 45 28 00 48 24 3E 00 00
RMS response:          21 38 28 00 45 24 3E 00 00

Command message sent:  21 30 34 00 48 48 20 00 FF
Expected response:     21 32 20 00 34 00 48 48 20 00 FF
RMS response:          21 32 34 00 45 48 20 00 FF
```

NAS-MD-790 states: The message shall be assigned to the RMS Master LU(20). The received message shall be inserted in its entirety, excluding link level control characters, after the command error message prefix.

FOLLOW-UP STATUS: DATE
Problem was corrected for Equipment Commands only. 09 /22 /93
CLOSURE DESCRIPTION:
_____ __ /__ /__
_____

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 034-R01
TTR TITLE: History Report not consistent with LU position	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS History Report
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Useability
REFERENCE: IMCS User History Report REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

IMCS history report (version PCC0702). When non-operating LU's are reported, the position of the reported LUID under the point No/LUID should not be changed.

Example: Is: Point No/LUID	Should Be: Point No/LUID
2A50	2A50
2A51	2A51
002C	2CNA
002D	2DNA

FOLLOW-UP STATUS: DATE
To be updated in R08.04. 01 /21 /93
CLOSURE DESCRIPTION:

Implemented in IMCS. Tested and verified. 10 /11 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 035-R01
TTR TITLE: Command Error not in History Report with other messages	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS User History Report
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement
REFERENCE: IMCS User History Report REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID _A4__ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A Command Error response from the RMS should be included into the IMCS history report where all the other priority messages are recorded.

10/11/93 - Command Error information is truncated in the User History Report. Often the truncation removes the most important information in the Error message.
Command Error messages from the RMS are not found in the DBH file/report which contains all other messages from the RMS.

FOLLOW-UP STATUS: IMCS users manual to be updated.	DATE 01 /21 /93
CLOSURE DESCRIPTION: Transferred to IMCS Hot Line for Tracking.	12 /10 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 036-R01
TTR TITLE: Point No of History Report - show DP for Equip Cmd	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS User History Report
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Useability
REFERENCE: IMCS User History Report REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID _A4__ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Equipment Control commands address a Data Point. The Point no field of the IMCS user history report should identify the data point for Equipment Control commands. The following LUID's have Equipment Control capability.

LUID

28 through 3320
3420
35 through 3C20
3D20

FOLLOW-UP STATUS: DATE
IMCS users manual to be updated. 01 /21 /93
CLOSURE DESCRIPTION:

Implemented in IMCS. Tested and Verified. 10 /11 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 037-R01
TTR TITLE: RVR rejected a correct Diagnostic Cmd for LU 34	TTR PRIORITY: Major II
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-SS-1000
REV/VOL I PAGE 111-13 PARA 30.1.1.15

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? No If NO, was the MPS log consulted? Yes

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

An ICD correct Diagnostic command was sent by IMCS to the RMS LU 0X34 and a command error was reported.

Command sent:	21	30	34	00	48	48	20	00	FF	B9
Response sent:	21	32	34	00	45	48	20	00	FF	A2

(Formerly TTR-017)

Expected response should have been a full off-line diagnostic test to LU 0X34. An SDR should have returned with the diagnostic results in LRU status, data points 22 through 29.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Proper response received. 11 /10 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 038-R01
TTR TITLE: RVR sends garbage data - requires retransmission	TTR PRIORITY: Critical I
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL _V__ PAGE _19_ PARA _3.2.1.1.4.1.1___	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Unsolicited "Garbage" was sent from the RMS to the MPS.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Problem corrected but new problem emerged. See TTR 062. 11 /10 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 039-R01
TTR TITLE: IMCS History Report "Normal" - should be RTN	TTR PRIORITY: Minor III
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS History Report
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Useability
REFERENCE: NAS-MD-790 REV/VOL 1986 PAGE 17 PARA 3.4.2	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When a hard or soft alarm condition is corrected, the IMCS History Report reports the RMS sent a Return to Normal (RTN) priority message as a normal. The point value of a RTN is Return to Normal. A normal point value is also a status value for some data points. The point condition value should describe this event as: Status/Return to Normal, not only Status.

FOLLOW-UP STATUS:	DATE
To be included in users manual.	01 /21 /93
CLOSURE DESCRIPTION:	
Transferred to IMCS Hot Line for Tracking.	12 /10 /93

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 040-R01
TTR TITLE: VS SIE 04 sensor - no alarm when contaminated	TTR PRIORITY: Minor III
ORIGINATOR: M. Jones	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-MD-790 REV/VOL 1986 PAGE 16 PARA 3.4.1	
TEST SEQUENCE: ID A3 STEP 21 PAGE 90	
TTR ORIGIN: Testing	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The sensor VS SIE 04 was physically contaminated with mud to the point that we could not even see the lens. No alarm was ever produced during this process.

Later the site status was checked. The window contamination alarm limits had been set to zero. A value of zero disables test.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
VS SIE 04 was site configured prior to the OT&E/ Integration Test with values of 0 to disable tests. 08 /21 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 041-R01
TTR TITLE: Constant Monitor alarms remained after RTN's	TTR PRIORITY: Minor III
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS:
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement

REFERENCE:
REV/VOL ____ PAGE ____ PARA_____

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN:	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Problem is under investigation. Requires further analysis.

FOLLOW-UP STATUS: DATE

CLOSURE DESCRIPTION: __ /__ /__
Several RMS/COM alerts occurred. Possible data loss may have occurred. 10 /08 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 042-R01
TTR TITLE: Missing RTN for LUID's 352A and 362A in History Report	TTR PRIORITY: Major II
ORIGINATOR: C. Bolling	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-MD-790 REV/VOL 1986 PAGE 17 PARA 3.4.2	
TEST SEQUENCE: ID A4 STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? No If NO, was the MPS log consulted? Yes

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Return-to-Normal for hard alarms LUID 352A and 362A were not received by IMCS History Report. The IMCS History Report only contains the hard alarm. The LM1 Protocol analyzer was not collecting data at this time. However, the LM1 was connected during another time period and RTN's from the RMS for LUID 352A and 362A were recorded into the history file. A global poll was initiated about 10 minutes later and the LU and D.P. indicated normal conditions. The LUID must Return-to-Normal to clear the alarm from the IMCS constant monitor screen. A condition of normal in a SDR is not equivalent to a RTN.

FOLLOW-UP STATUS: DATE

CLOSURE DESCRIPTION: __ /__ /__

Two RMS/COM alerts occurred possibly causing data loss. 10 /07 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 043-R01
TTR TITLE: Note 9 in ICD for LU 0X25 is unclear	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 8/21/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-MD-790 REV/VOL 1986 PAGE 1 PARA 1.3 and 3.3.4	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Note 9 on LUID 2521 and other similar LUID's is unclear. The ICD states: A value of -1 indicates that the software version number is not available in the MPU. It is unclear in what field(s) the value of -1 will appear.

The Note also states: The software (S.W.) numbers can be obtained only by executing the S.W. version command at the DPU MDT interface. However, the RMS responding with a Site Data Report from LUID 2521 will also have the S.W. version field included.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Memo to Elyas Farzan from J. Thorne 11/4/92 - IDD update. 11 /10 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 044-R01
TTR TITLE: No alarm when MPU AC power is removed	TTR PRIORITY: Minor III
ORIGINATOR: C. Bolling	OBSERVED: 8/20/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS/DPU	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 16 PARA 3.4.1

TEST SEQUENCE: ID A3 STEP 19 PAGE 89

TTR ORIGIN: Testing	PROBLEM REPRODUCED? No If NO, was the MPS log consulted? Yes

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The MPU AC power was turned off. AC power remained off for approximately 2 minutes. No hard alarm message was generated and sent from the RMS to the IMCS/MDT.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
MPU respon for all comm. - comm alert gen by MPS. 11 /11 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 045-R01
TTR TITLE: LU 0X34 Returned undefined data.	TTR PRIORITY: Major II
ORIGINATOR: C. Szlaczky	OBSERVED: 9/29/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 1 & 16 PARA 1.3 and 3.4.1

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Data returned for LU 0X34 is undefined.

RMS Data Returned: 21 1E 34 00 41 2A 43 00 03

NAS-MD-790 states: Message length shall always be either four or six bytes with three fields: Data Point ID, Condition Status, and Numeric Value, respectively following the message prefix. The numeric value (monitored value) shall be -32768 to +32767, or 0 if not applicable. The ICD does not define the data value returned. Therefore, if not applicable, force to zero, if applicable it needs to be defined.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
IDD rev 11/4/92. Memo from Thorne to Farzan. 11 /11 /92

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 046-R01
TTR TITLE: Time Stamp Mismatch of Command vs IMCS History Report	TTR PRIORITY: Minor III
ORIGINATOR: C. Szlaczky	OBSERVED: 09/29/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE:
REFERENCE: IMCS REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A mismatch between the coded IMCS archive data command message and the IMCS users history report. Coded IMCS message for year, month, day, time is: 1992 08 18 19 36 00. Time stamp in the IMCS user history report is: 08/18/92 19:49:35. The 13 minute 35 second time difference between the coded IMCS message and the IMCS users history report is excessive.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Operation is correct. 01 /20 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 047-R01
TTR TITLE: Wrong Busy Message Format by RMS	TTR PRIORITY: Major II
ORIGINATOR: C. Szlaczky	OBSERVED: 9/29/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-MD-790 REV/VOL 1986 PAGE 21 PARA 3.5.3	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Incorrect RMS Busy Format. This message is assigned to the RMS Master Logic Unit (LU 20). The incorrect LU (42) was inserted into the message.

LM1 Command Data from IMCS: 21 70 42 00 48 47 07 C8 00 08 00 12 00 13 00 24 00 00.

Expected response: 21 36 20 00 46 4C 4F 43 4C
RMS Response: 21 36 42 00 46 4C 4F 43 4C

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Correct response format. 11 /11 /92

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 048-R01
TTR TITLE: IMCS Did Not Identify Incorrect Busy Message Format	TTR PRIORITY: MINOR III
ORIGINATOR: C. Szlaczky	OBSERVED: 09/23/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 21 PARA 3.5.3

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

IMCS did not identify the incorrect formatted Busy message. The incorrect LU(42) was inserted into the message in place of the correct LU(20). IMCS History report reports the Busy message as LU20 not LU42 as sent by the RMS.

LM1 command data from IMCS: 21 70 42 00 48 47 07 C8 00 08 00 12 00 1300 24 00 00.

Expected response: 21 36 20 00 46 4C 4F 43 4C

RMS response: 21 36 42 00 46 4C 4F 43 4C

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
IMCS does not check for format. 01 /20 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 049 R02 REV01
TTR TITLE: Missing availability status	TTR PRIORITY: Minor III
ORIGINATOR: C. Szlaczky	OBSERVED: 11/17/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 14 & 22A PARA 3.3.3.1 & 3.6

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The RMS is returning availability status in SDR's but not as Data Point Values. IMCS will only display Data Points therefore the availability status will not be in the status screen. Also, note 1, per 3.1.3.2.9 note 1, for each LU listed below is not referenced in the LU tables.

Examples of the LU's are:
21, 22, 23, 3D, 3E, 3F, 40, 41 42 through 44 and 45.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
New NAS-MD-790A does not require availability status. 01 /21 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 050 R02
TTR TITLE: Screen selection for LU 3E	TTR PRIORITY: Minor III
ORIGINATOR: C. Szlaczky	OBSERVED: 11/14/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Useability

REFERENCE: RVR IDD
REV/VOL 8/10/92 PAGE 59 PARA _____

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Under the screen ID selection menu, LU 3E is listed two times. The names are: Runway Configuration #1 (RC1) and Runway Configuration #2 (RC2). The IDD LU 3E title is: SDR for Runway Configuration. Since RC2 is a continuation of RC1 data points, it would eliminate confusion if one screen was named: SDR for Runway Configuration and the other screen was named: SDR for Runway Configuration continued.

FOLLOW-UP STATUS: DATE
ANA-120 specifies this is to be corrected. 06 /15 /93
CLOSURE DESCRIPTION:

Correction was verified. 01 /21 /93

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 051 R02
TTR TITLE: Password change	TTR PRIORITY: Major II
ORIGINATOR: C. Szlaczky	OBSERVED: 11/13/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Other
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Provision is not available at the Password Command screen to initiate a Password Change command. However, the Password Change status screen, LU 3F, will be displayed with all the information of password status. When changing the password at the MDT, state change messages are returned to the MPS. Any information regarding the password change LU 3F should be encoded in IMCS. Possible security violation.

FOLLOW-UP STATUS:	DATE
ANN-140 will provide proposal to ANA-120.	01 /21 /93
CLOSURE DESCRIPTION:	
Password Change command was tested and verified.	06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 052 R02
TTR TITLE: MDT numerical read/write values	TTR PRIORITY: Major II
ORIGINATOR: C. Szlaczky	OBSERVED: 11/13/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and RMS MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS/MDT	CATEGORY OF FAILURE: Useability
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

MDT inputing/reading numerical values requires the use of a calculator. The values desired to input or read requires manipulation of the RVR internal units and a numerical value. The input or read value should be a final number with the manipulating done by the RMS.

FOLLOW-UP STATUS:	DATE
ANN-140 to investigate. Ref to TTR 054-R02.	01 /21 /93
CLOSURE DESCRIPTION:	
MDT scaling factor is now a power of 10. Only decimal place movement is necessary at MDT	06 /24 /94

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 053 R02
TTR TITLE: Redundant data input required for LU 2B 3A	TTR PRIORITY: Minor III
ORIGINATOR: C. Szlaczky	OBSERVED: 11/13/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-793
REV/VOL Feb 1986 PAGE 3-1, 3-3 PARA 3.1, 3.2

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

LU ID 2B 3A required inputing a data value from IMCS more than one time before the new value was displayed at the RMS MDT. The input from IMCS was visually checked at the LM1.

FOLLOW-UP STATUS: DATE
ANN-140 direct mfg to investigate. 01 /21 /93
CLOSURE DESCRIPTION:
The RVR Parameter.Limits screen does not update automatically. Modified procedure. Tested OK. 06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 054 R02
TTR TITLE: MDT input procedure	TTR PRIORITY: Annoyance IV
ORIGINATOR: D. Fields	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS/MDT	CATEGORY OF FAILURE: Useability
REFERENCE: REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The procedure to input values via the MDT is difficult to manipulate. To input values via the MDT, the user must "TAB" to the field wanted, press "<CR>", then use the "DELETE" key prior to actually inputing the desired value. This process is consistent with all data input values and parameters.

NOTE: (Added 06/24/94) The use of "TAB" to move from field to field or selection to selection is no longer valid. It's use was apparently removed when the arrow key movement was added.

FOLLOW-UP STATUS:	DATE
ANN-140 to investigate ref to TTR 052-R02.	01 /21 /93
CLOSURE DESCRIPTION:	
The MDT now allows use of arrow keys in movement. Acceptance of change is Enter plus "yes" approval.	06 /24 /94

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 055 R02
TTR TITLE: VS SIE 02 lost cal data on cold restart	TTR PRIORITY: Major II
ORIGINATOR: T. Carty	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: VS SIE 02	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL III PAGE 6 PARA 3.1.3.2	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? No If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

After performing "Cold Restart" from the MDT connected to the DPU, VS SIE 02 went to "Failed Off-Line" status. Diagnostics revealed code 25, SIE-UNCALIB-LRU. Diagnostics at SIE revealed calibration value of .606. This is an old value no longer used. Recalibrated sensor using 1.2 value. All other SIE's retained the proper value (1.2) during cold restart.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Refer to AOS-220 problem form #90. 01 /21 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 056 R02
TTR TITLE: ALS SIE lost cal after pwr down	TTR PRIORITY: Major II
ORIGINATOR: T. Carty	OBSERVED: 11/13/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: ALS SIE	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 REV/VOL III PAGE 6 PARA 3.1.3.2	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? No If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Powered down ALS SIE for MPS alarm testing. When power was restored, ALS SIE went to "Failed Off-Line" status. Diagnostics revealed code 25, "SIE-UNCALIB-LRU." Recalibration of sensor cleared fault.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Refer to AOS-220 problem form #90. 01 /21 /93

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 057 R02
TTR TITLE: Clarify purpose of LU 23	TTR PRIORITY: Minor III
ORIGINATOR: C. Szlaczky	OBSERVED: 11/13/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: IDD REV/VOL 10 Aug PAGE 39 PARA Table IX	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

LU 23 should not be included into the constant monitor and active alarms screens. LU 23 is a system health LU, (does not have any alarmable data points), that only reports the link MER status of other LU's.

NOTE: The MER status data from LU 23 is added to the constant monitor/active alarm screens when a poll is made to LU 23. This alarm will remain on the constant monitor/status screen until a RTN has removed the alarm from the LU that generated the alarm and a poll is initiated to LU 23.

FOLLOW-UP STATUS:	DATE
ANN-140 will provide proposal to ANA-120.	01 /21 /93
ACN-100D to verify.	
CLOSURE DESCRIPTION:	
LU 23 is no longer available. Status in other LU's.	06 /24 /94

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 058 R02
TTR TITLE: MDT Product-Edit, Override-Fail screen	TTR PRIORITY: Minor III
ORIGINATOR: D. Fields	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Useability
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN:	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Intermittently, the total amount of pages for the MDT Product-Edit Override-Fail screen would be numbered from 0 to an unknown maximum. A sample was taken and we quit sampling when we reached 40 pages.

FOLLOW-UP STATUS: DATE

ANN-140 directed MFG to correct/ACN-100D to verify. 01 /21 /93

CLOSURE DESCRIPTION:

Correction tested and verified. 06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 059 R02
TTR TITLE: MDT Product-Edit, Override-Fail page #0	TTR PRIORITY: Minor III
ORIGINATOR: D. Fields	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Useability
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Intermittently, the first page number of the Product-Edit Override-Fail screen begins with 0. Advancing to page 1, then selecting go to previous page, the page number remained at 1 not 0.

FOLLOW-UP STATUS: DATE
ANN-140 directed MFG to correct/ACN-100D to verify. 01 /21 /93
CLOSURE DESCRIPTION:

Correction tested and verified. 06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 060 R02
TTR TITLE: RVR to MDT communication loss.	TTR PRIORITY: Major II
ORIGINATOR: D. Fields	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-MD-793 REV/VOL 2/28/86 PAGE 3-9 PARA 3.3.5	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Communication is lost between the RVR and the MDT when initiating an "execute configuration change" command on the product-edit. Manual entry-screen. It was also observed that the DPU MPU front panel light is momentarily extinguished.

FOLLOW-UP STATUS: DATE
ANN-140 directed MFG to correct/ACN-100D to verify. 01/21 /93
CLOSURE DESCRIPTION:

Correction tested and verified. 06 /15 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 061 R02
TTR TITLE: MPS double RR's	TTR PRIORITY: Annoyance IV
ORIGINATOR: Conrad Szlaczky	OBSERVED: 11/10/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Other
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When data has been sent from the RMS to the MPS, the MPS responds with two RR's. The first RR from the MPS is with the P/F bit set to 0 and the second RR with the P/F bit set to 1. The MPS polling rate is 1.13 seconds.

FOLLOW-UP STATUS:	DATE
ARTCC to slow down continuous polling rate to approx. 3 sec. ACN-100D to verify.	01 /21 /93
CLOSURE DESCRIPTION: Symptom is characteristic of Two Way Simultaneous (TWS) Mode. MPS was in TWS mode.	12 /10 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 062 R02
TTR TITLE: RMS data stops and restarts	TTR PRIORITY: Annoyance IV
ORIGINATOR:	OBSERVED: 11/10/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Other
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The RMS occasionally will prematurely stop sending a data frame and then automatically re-send that data frame in it's entirety.

FOLLOW-UP STATUS:	DATE
ANN-140 will direct MFG to correct. ACN-100D to verify.	01 /21 /93
CLOSURE DESCRIPTION:	
This problem was no longer found in Sept 93 test.	11 /03/ 93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 063 R02
TTR TITLE: MPS polls while RMS is sending data	TTR PRIORITY: Annoyance IV
ORIGINATOR:	OBSERVED: 11/10/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Other
REFERENCE: REV/VOL ____ PAGE ____ PARA_____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The MPS will occasionally send an RR while the RMS is still in process of sending a data frame. MPS polling rate 1.3 seconds.

FOLLOW-UP STATUS:	DATE
ARTCC to slow down continuous polling rate to approx. 3 sec. ACN-100D to verify.	01 /21 /93
CLOSURE DESCRIPTION: Symptom is characteristic of Two Way Simultaneous (TWS) Mode. MPS was in TWS Mode.	12 /10 /93

APPROVED:TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 064 R02
TTR TITLE: Current LCD display of MDT inadequate	TTR PRIORITY: Minor III
ORIGINATOR: T. Carty	OBSERVED: 11/14/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: MDT	CATEGORY OF FAILURE: Other

REFERENCE:
REV/VOL ____ PAGE ____ PARA_____

TEST SEQUENCE: ID _____ STEP _____ PAGE _____

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The current type of MDT with an LCD display is inadequate for outdoor bright days. The LCD display is not visible with a bright ambient surrounding.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
ANA-200 will be advised of problem. 01 /21 /93

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 065 R02 REV01
TTR TITLE: Old data in data base	TTR PRIORITY: Annoyance IV
ORIGINATOR: D. Fields	OBSERVED: 11/15/92
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 MMS/IMCS VER: PCC 0711
SUB-SYSTEM FAILURE: IMCS	CATEGORY OF FAILURE: Other
REFERENCE: REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Old data for status screens is still in the data base for unconfigured LU's VS SIE 10, 11, 12 and RLIM 07 and 08.

FOLLOW-UP STATUS: DATE __ /__ /__

CLOSURE DESCRIPTION:
Normal IMCS operation. 01 /21 /93

APPROVED: TEST DIRECTOR FNL

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 066 R03
TTR TITLE: RMS response to DISC while already in DM is UA vs DM	TTR PRIORITY: Minor III
ORIGINATOR: Ray Haines	OBSERVED: 06/14/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MPS Simulator Version 1.1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: PCC 0702
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement
REFERENCE: ANSI X3.66 (1979) REV/VOL 1979 PAGE 45 PARA 7.4.1.8	
TEST SEQUENCE: ID Cat A STEP 9 PAGE 17	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When the RMS was in Disconnect Mode (DM) because of a disconnect (DISC) command from the MPS simulator, the RMS responded to a second DISC with and Unnumbered Acknowledge -ment (UA) instead of DM for Disconnect Mode.

NAS-MD-790 table 4-2 states "The RMS will respond with a DM response until receipt of a SNRM." Also refer to ANSI X3.66 1979 (ADCCP) paragraph 7.4.1.8 Disconnect (DISC) command.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:
Response to Disconnect command when in disconnect mode is now DM as expected. 06 /24 /94

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 067 R03
TTR TITLE: Wrong Description is used for De-Ice Heater	TTR PRIORITY: Annoyance IV
ORIGINATOR: Darren Fields	OBSERVED: 06/14/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: IMCS and LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: PCC 0702
SUB-SYSTEM FAILURE: RVR Decoder Module	CATEGORY OF FAILURE: Useability
REFERENCE: ICD (June 7, 1993) REV/VOL G PAGE 51 Para _____	
TEST SEQUENCE: ID Cat A2 STEP 9 PAGE 39	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The data point description for the "Deice Heater was incorrectly described as "Device Heater". This error was found on all VS SIE logical unit status screens (LU's 28 thru 39) and on the ALS SIE logical unit status screen (LU 3A)

For LU's 28 thru 39 (VS SIE):

LUID	Description
0x40	VS TX Deice Heater
0x42	VS RX Deice Heater

For LU 3A (ALS SIE)

LUID	Description
0x3B	ALS Deice Heater

FOLLOW-UP STATUS: DATE

_____ __/__/__

_____ __/__/__

CLOSURE DESCRIPTION:

Problem corrected. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 068 R03
TTR TITLE: Command Error Message for some commands is incorrect	TTR PRIORITY: Minor III
ORIGINATOR: Ray Haines	OBSERVED: 06/14/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MPS Simulator Version 1.1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: PCC 0702
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-MD-790
REV/VOL 1986 PAGE 21 PARA 3.5.2

TEST SEQUENCE: ID Cat A STEP 11 PAGE 17

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A Schedule Poll was sent for a non existent LU (EF) and a Command Error Message was received. The Command Error Message did not contain the original command as expected. The error message contained only a portion of the original message. An invalid command was also sent for a Threshold Change and the response did not contain the original command. When the command error failed, it contained only the message function code, data point (or command), and the parameters.

The command error message for an invalid Equipment Control Command did contain the original message as expected. Whenever the message function code was 48H, the command error message was as expected. The expected command error contained the Logical Unit, delimiter, message function code, data point (or command), and any parameters.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:
Command error message for the stated condition was tested and was found to be corrected. 06 /24 /94

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 069 R03
TTR TITLE: RMS Incorrectly prioritizes messages	TTR PRIORITY: Minor III
ORIGINATOR: Jeffrey Henderson	OBSERVED: 06/14/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MPS SIMULATOR Version 1.1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: PCC 08??
SUB-SYSTEM FAILURE: RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: NAS-SS-1000
REV/VOL V PAGE 22 PARA 3.2.1.1.4.2.8

TEST SEQUENCE: ID Cat A1 STEP 7 PAGE 20

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The RMS incorrectly prioritized the first message during the Priority Message Test. During the Test, a State Change message was sent out before Alarm messages. The State Change was for Terminal Communications (LUID 2120) and was probably a result of removing the MPS-RMS cable. Alarm and return-to-normal messages were induced for the test. After the cable was replaced, the first message was the Terminal Communication State Change. The Terminal Communication State Change message was not prioritized with the other messages.

FOLLOW-UP STATUS: DATE
Same result on retest. 09 /22 /93
__ /__ /__

CLOSURE DESCRIPTION:
Decided to accept first message out of priority as it was prioritized when it was queues for trans. 09 /22 /93

APPROVED:
TEST DIRECTOR

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 071 R03
TTR TITLE: Data point description incorrect LU27 DPs 31, 32, 33, 34	TTR PRIORITY: Minor III
ORIGINATOR: Mike Jones	OBSERVED: 06/15/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified-R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement

REFERENCE: ICD
REV/VOL G PAGE 48 PARA Table XIII

TEST SEQUENCE: ID Cat A2 STEP 8 PAGE 37

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Data point description display is incorrect for LU27 - ID's 31, 32, 33, 34. Data point description in ICD did not match display on IMCS screen.

IMCS

LUID				
2731	PPU	EU	0	loop
2732	PPU	EU	1	loop
2733	PPU	EU	2	loop
2734	PPU	EU	3	loop

ICD

LUID			
2731	PPU	EU1	Loop
2732	PPU	EU2	Loop
2733	PPU	EU3	Loop
2734	PPU	EU4	Loop

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

Problem corrected. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 072 R03
TTR TITLE: Alarm indicated on wrong LUID	TTR PRIORITY: Major II
ORIGINATOR: Ray Haines	OBSERVED: 06/17/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified-R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement

REFERENCE: ICD
REV/VOL G PAGE 44 PARA Table XI

TEST SEQUENCE: ID A4 STEP 21-24 PAGE 118

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Threshold change commands were sent to LUID 252B (DPU_PLUS_5V soft_alarm_high_limit) to cause an alarm to LUID 252A (DPU_PLUS_5V) and to LUID 283B (VS_Tx_Wind_CONTAM) Soft_Alarm_High_Limit) to cause an alarm for LUID 2839 (Vs_Tx_ Wind_CONTAM). The Constant Monitor displayed an alarm for LUID 252B and to LUID 283B but the constant monitor displayed the alarm on the alarm limits. The LUID did not return-to-normal after a Threshold Change command was sent, and a status command had to be sent to remove the alarm. This also occurred while doing the same for LUID 2533 (DPU_MINUS_12V) and LUID 2334 (Soft_Alarm_High_Limit).

FOLLOW-UP STATUS:	DATE
Partially corrected at time of Sept 1993 retest	09 /22 /93
	__ /__ /__
CLOSURE DESCRIPTION:	
All problems corrected.	12 /10 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 073 R03
TTR TITLE: VS sensor failure & VS SIE fail stat not clear cons monit	TTR PRIORITY: Minor III
ORIGINATOR: Ray Haines	OBSERVED: 06/18/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified-R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 I III-15 30.1.1.9 REV/VOL V PAGE 19 PARA 3.2.1.1.4.1.9	
TEST SEQUENCE: ID A-3 STEP 25-28 PAGE 109-110	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

During the alarm test for LU29 ID's 43 and 44, it was observed that when they were returned to normal, they were still in an alarm state on the constant monitor display. This condition was subsequently corrected by performing a status request.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

Problem corrected. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 075 R03
TTR TITLE: LU 48 Current Sensor X has wrong point value	TTR PRIORITY: Minor III
ORIGINATOR: Darren Fields	OBSERVED: 06/16/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: ICD REV/VOL G PAGE 67 PARA Table XVIII note 5	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The Runway Configuration Logical Unit 48, displays the wrong point value for the Current Sensor LUID's. The point value displayed is "25 Amp, Edge (or Center)". The point value should be "20 Amp, Edge (or Center)".

FOLLOW-UP STATUS: DATE

_____ __/__/__

_____ __/__/__

CLOSURE DESCRIPTION:

Problem corrected. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 077 R03
TTR TITLE: Character remains on Constant Monitor	TTR PRIORITY: Annoyance IV
ORIGINATOR: Ray Haines	OBSERVED: 06/23/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Usability
REFERENCE: N/A REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID N/A ___ STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A character was left on the Constant Monitor screen after an alarm was incorrectly displayed on LUID 2534 (Soft_Alarm_High_Limit for DPU Plus 5V). The character appears to be the "t" from the word "Soft". The character remained on the Constant Monitor throughout the test until the end of the day.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

No trouble found during retest. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 078 R03
TTR TITLE: Terminal messages are repeated	TTR PRIORITY: Minor III
ORIGINATOR: Jeffrey Henderson	OBSERVED: 06/23/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: MDT and LM1
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: REV/VOL ____ PAGE ____ PARA _____	
TEST SEQUENCE: ID _____ STEP _____ PAGE _____ Cat. 41	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

When terminal messages were previously sent, there was not a problem. On the seventh day, we sent a short terminal message - "This". After a couple of hours, we found that the Terminal Message (TM) was repeating itself (but not by RMS re-sending it). The TM's were deleted but later more were found.

When all TM's are deleted, the constant monitor still displays "Terminal Message" in reverse video. The TM screen indicates "No Terminal Message" to display for this function.

FOLLOW-UP STATUS: DATE

_____ __/__/__

_____ __/__/__

CLOSURE DESCRIPTION:

No trouble found during retest. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 079 R03
TTR TITLE: IMCS Point Description should be consistent	TTR PRIORITY: Annoyance IV
ORIGINATOR: Darren Fields	OBSERVED: 06/15/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: None
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RMS RVR Decoder	CATEGORY OF FAILURE: Usability

REFERENCE:
REV/VOL N/A PAGE ____ PARA _____

TEST SEQUENCE: ID CAT A2 STEP 9 PAGE 39 (starts at)

TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

In LU's 28 through 39, the first letter of Soft, Hard, and Alarm should be capitalized in the Point Description.

The RVR decoder should be consistent in the use of capital letters.

FOLLOW-UP STATUS: DATE

_____ __/__/__

_____ __/__/__

CLOSURE DESCRIPTION:

Problem corrected. No further problems found. 09 /22 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 080 R03
TTR TITLE: Unexpected RMS/Comm Alert message	TTR PRIORITY: Major II
ORIGINATOR: Ray Haines	OBSERVED: 06/23/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Usability
REFERENCE: REV/VOL N/A PAGE ____ PARA _____	
TEST SEQUENCE: ID N/A STEP _____ PAGE _____	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

Throughout the testing of the RVR IMCS Decoder, a RMS/Comm Alert message with a Point Value of Normal was issued whenever there were no RMS messages for 30 minutes. The purpose for this message is not entirely clear, since the RMS/Comm Alert was in Alarm, and there were no additional messages (at one point for four hours) until the LUID returned to a normal condition. It would be more appropriate to issue the RMS/Comm Alert Alarm each 30 minutes rather than the Normal message.

There also may be a connection between this message and the problems sending commands. Each time the RMS/COM was Normal, the first command had to be sent three times before it was executed.

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

Problem no longer found at retest. 10 /11 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 081 R03
TTR TITLE: RVR Decoder incorrectly identifies alarm messages	TTR PRIORITY: Major II
ORIGINATOR: Ray Haines	OBSERVED: 06/22/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM1 and MDT
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Modified- R08.04
SUB-SYSTEM FAILURE: RVR IMCS Decoder	CATEGORY OF FAILURE: Requirement
REFERENCE: NAS-SS-1000 Volume 1, Appendix III REV/VOL Above PAGE -- PARA 3.1.1.6	
TEST SEQUENCE: ID CAT A3 STEP 29&30 PAGE 111	
TTR ORIGIN: Test	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

For a period of about 3 hours, the RVR IMCS Decoder did not correctly identify hard and soft alarms. All of the Point Conditions in this span were Inactive/Return to Normal. The RVR decoder did not indicate alarms until after a status request was issued.

Prior to this, a Terminal Message (TM) was sent by the RMS. This TM caused the decoder to indicate the same TM repeatedly (See TTR-103 R03).

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:

Problem no longer found during Sept retest. 11 /03 /93

APPROVED:
TEST DIRECTOR _____

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 082-R05
TTR TITLE: IDD Error, Incorrect SIE LU Number Range	TTR PRIORITY: V OTHER
ORIGINATOR: Ray Haines	OBSERVED: 12/10/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: None
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Documentation

REFERENCE:
REV/VOL G PAGE 19 PARA 3.1.3.1.7 Note 2

TEST SEQUENCE: ID --- STEP --- PAGE ---

TTR ORIGIN: Observation	PROBLEM REPRODUCED? N/A If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

A error exists in the Interface Design Document for the Runway Visual Range System Data Processing Unit to Maintenance Processor Subsystem Rev G, which is potentially confusing. On page 19, 3.1.3.1.7 note 2 displays the LRU Status Field for the fault -diagnostic-command format. The note gives LU numbers for different units. The IDD shows that LU numbers for SIE's are from 0x28 through 0x3C. This range represents all 18 VS SIE's, the ALS SIE, and only the first two RLIM SIE's. This should be corrected to show that LU numbers for SIE LRU's exist from 0x28 through 0x46 to include the remaining RLIM SIE's.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:
Corrected by Rev H May 17, 1994 IDD update. 06 /13 /94

APPROVED:
TEST DIRECTOR _____

B-80

ACN-100D TEST TROUBLE REPORT (TTR)

PROJECT: RVR	TTR #: 084-R05
TTR TITLE: Rate-of-Change DP was Temperature at MDT	TTR PRIORITY: III MINOR
ORIGINATOR: Ray Haines	OBSERVED: 12/06/93
MPS LOCATION: ZKC RMS LOCATION: MCI	TEST TOOLS: LM-1 Protocol Analyzer
PATHWAY: Separate MMS/IMCS: Stand-Alone	OP SYS: C-30 Release 30.07 MMS/IMCS VER: Unknown
SUB-SYSTEM FAILURE: RVR RMS	CATEGORY OF FAILURE: Requirement

REFERENCE: Interface Design Document (June 7, 1993)
REV/VOL G PAGE 51&53 PARA 3.2.1.1.4.2.7

TEST SEQUENCE: ID --- STEP --- PAGE ---

TTR ORIGIN: Analysis	PROBLEM REPRODUCED? Yes If NO, was the MPS log consulted?

PROBLEM DESCRIPTION & DUPLICATION PROCEDURE:

The VS (DP 46) and ALS (DP 3F) Rate of Change was used for providing the temperature of the sensor head. At the MPS, the data point was not monitored. At the MDT the Rate of Change was displayed as usual but instead the head temperature value was displayed. This was a temporary engineering change which should now be completed. The Rate of Change value needs to be restored. The head temperature of the sensor will need a data point assigned to it to provide a means for sending this information to the MPS.

(Contact ACN-100D if additional information is required.)

FOLLOW-UP STATUS: DATE

_____ __ /__ /__

_____ __ /__ /__

CLOSURE DESCRIPTION:
DP is found in Rev H of ICD (not monitored yet) 06 /24 /94

APPROVED:
TEST DIRECTOR _____

B-81