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Network Control Center Data System, 1998 (NCC 98)

Test Report

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National Aeronautics and Space Administration

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Network Control Center Data System, 1998 (NCC 98) Test Report

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By
Computer Sciences Corporation

Prepared By:

3-24-99
A. Wolff — Date
NCC Integration and System Test Lead

Approved By:

3-24-99
K. Sharma — Date
Technical Manager
Integration and Test Department

Quality Assured By:

3/24/99
M. Sanchez — Date
NCC Quality Assurance Officer

Approved By:

3/24/1999
D. DeSantis — Date
Project Manager
SODA G948 – NCC 98 Project

Goddard Space Flight Center
Greenbelt, Maryland

Preface

This document, the *Network Control Center Data System, 1998 (NCC 98) Test Report* provides a summary of the testing activities, including final status summaries. Integration Testing, System Testing, and Year 2000 Validation testing for all builds of NCC 98 are covered in this test report.

Questions concerning this document shall be addressed to:

NCC Integration and System Test Lead
Code 451
Goddard Space Flight Center
Greenbelt, Maryland 20771

Abstract

This document presents the report for testing of NCC 98 software. It contains the following:

- Schedules of completed activities and milestones
- Description of the test environments
- A list of the documents used as a basis for validating the NCC 98 software
- Final status summaries of test items and problem reports
- Lessons learned during NCC 98 testing

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Section 1. Introduction

1.1 Purpose and Scope

This document, the Network Control Center Data System, 1998 (NCC 98) Test Report, describes the testing materials and procedures that were used to verify that the software delivered with release NCC 98 fulfilled its allocated requirements and system level functionality. This document was prepared to report the results of the NCC 98 integration testing and system testing phases, as well as Year 2000 validation testing.

The scope of the document includes information regarding the system capabilities and configuration, the test schedule, and the test results.

1.2 Applicable Documents

The following documents were either referenced during the preparation of this report, or were applicable to the testing of NCC 98.

a. *Network Control Center Data System, 1998 (NCC 98) System Test Test Plan,* 530-STP-NCCDS/R98, October 1995

b. *Network Control Center Data System (NCCDS) 1998 (NCC 98) Integration Test Plan,* 530-ITP-NCCDS/1998, May 1996

c. *Network Control Center Data System (NCCDS) System Requirements, 1998,* 530-SRD-NCCDS/1998, Revision 2 Draft, April 98

d. *Interface Control Document between the Network Control Center Data System and the Mission Operations Centers*, 530-ICD-NCCDS/MOC, May 98

e. *Interface Control Document Between the Network Control Center Data System and the Nascom Control and Status System,* 530-ICD-NCCDS/NASCOM, Revision 2, December 95

f. *Interface Control Document between the Network Control Center Data System and the Sensor Data Processing Facility*, 530-ICD-NCCDS/SDPF, Revision 2, December 95

g. *Interface Control Document (ICD) between the Network Control Center (NCC)/Flight Dynamics Facility (FDF) and the White Sands Complex (WSC),* 530-ICD-NCC-FDF/WSC, Revision 5, June 97

h. *SPSR User's Guide* (Online), continuous updates

i. *CCS User's Guide* (Online), continuous updates

j. *NPG User's Guide*, continuous updates

k. *NCD User's Guide*, continuous updates

l. *Firewall User's Guide*, continuous updates

m. *NSM Build A/B User's Guide*

n. *NASA Year 2000 Agency Test and Certification Guidelines and Requirements, Volume 1*, July 2, 1998

o. NCC 98 System Test Completion Letter, November 30, 1998

1.3 Assumptions

This test plan assumes that the reader has a basic understanding of the NCCDS configuration for NCC 98 and the NCC operational capabilities. Standard terminology as applied to the NCC by NASA is used whenever possible.

Section 2. Integration Testing

2.1 Test Case Content

The focus of Integration Testing was to ensure the proper design of the system based on the System Design Specifications and to validate that the system was ready for system testing. To accomplish this, integration testing focused on internal NCCDS interfaces, message throughput, restart/recovery capabilities, high-level design, user's guide completeness and operator interfaces. The following test cases were identified:

Table 2-1. Integration Test Cases

Test Case	Title	Number of Test Items
INCC101	System Integration and Build Verification Test	33
INCC102	Exception Handling/Restart Recovery	22
INCC103	SRIS: Network System Manager	13
INCC105	SRIS: Operator Workstations	12
INCC107	SPSR: Utilities Subsystem	19
INCC108	SPSR: User Interface Subsystem	21
INCC109	SPSR: Data Base Subsystem	27
INCC110	SPSR: Input Subsystem	22
INCC111	SPSR: Scheduling Subsystem	23
INCC112	SPSR: Output Subsystem	16
INCC113	SPSR: Acquisition and Tracking	7
INCC114	CCS: Utilities	31
INCC115	CCS: Monitor and Control	6
INCC116	CCS: High-Speed Message Exchange	29
INCC117	CCS: Reconfigure Ongoing Services	20
INCC118	CCS: Monitor/Disseminate Performance Data	22
INCC119	Year 2000 Rollover	8

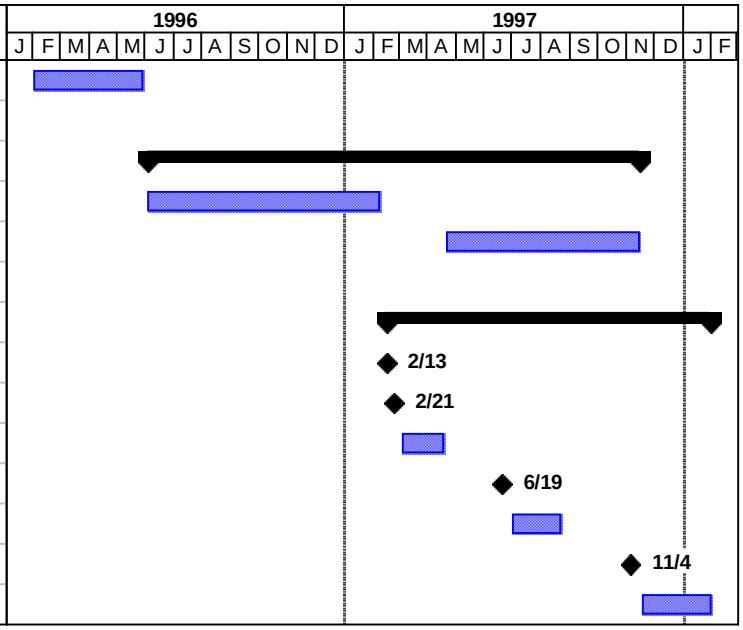
Detailed test procedures and Pass/Fail criteria were developed for each test item. The detailed procedures for Builds A/B and C were documented in a Test Procedures document for each build, and were delivered to the NCC 98 web page.

2.2 Test Schedule

The integration testing phase of NCC 98 was performed in three builds: A, B, and C. The high-level schedule of Integration Test activities is presented in the following figure.

Figure 2-1. Integration Test Activities Schedule

ID	Task Name	Start	Finish
1	Integration Test Plan	2/1/96	5/28/96
2			
3	**Integration Test Procedures**	**6/3/96**	**11/14/97**
4	Build A/B	6/3/96	2/7/97
5	Build C	4/21/97	11/14/97
6			
7	**Integration Test Execution**	**2/13/97**	**1/30/98**
8	Build A ITRR	2/13/97	2/13/97
9	Build A Follow -up ITRR	2/21/97	2/21/97
10	Build A	3/3/97	4/18/97
11	Build B ITRR	6/19/97	6/19/97
12	Build B	6/30/97	8/22/97
13	Build C ITRR	11/4/97	11/4/97
14	Build C	11/17/97	1/30/98



2.3 Test Environment and Configurations

2.3.1 Build A

Build A integration testing was performed in test berth 2 in the T&T in Building 13 at GSFC. The software and hardware configuration is presented in Table 2-2.

Table 2-2. Build A Test Configuration

	Operating System	Application Software
CCS	VMS 6.1	NCC 98, Build A
SPSR	HP-UX 10.20	NCC 98, Build A
Workstations	HP-UX 10.20	NCC 98, Build A
NSM	HP-UX 10.10	NCC 98, Build A
NFE	N/A	94.1a
INPG	N/A	NCC 98, Build A
NTS	Unix 6.0	96.1

2.3.2 Build B

Build B integration testing was performed in test berth 2 in the T&T in Building 13 at GSFC. The software and hardware configuration is presented in Table 2-2.

Table 2-3. Build B Test Configuration

	Operating System	Application Software
CCS	VMS 6.1	NCC 98, Build B
SPSR	HP-UX 10.20	NCC 98, Build B
Workstations	HP-UX 10.20	NCC 98, Build B
NSM	HP-UX 10.10	NCC 98, Build B
NPG	Solaris 2.5.1	NCC 98, Build B
SCD	Linux 2.0.15	3.0
NTS	Unix 6.0	97.1.2

2.3.3 Build C

Build C represented the final build of NCC 98, and so all components were included in the test environment. Build C integration testing was performed in test berth 3 in the T&T in Building 13 at GSFC.

Table 2-4. Build C Test Configuration

	Operating System	Application Software
CCS	VMS 6.1	NCC 98, Build C
SPSR	HP-UX 10.20	Patch 1.3a
Workstations	HP-UX 10.20	NCC 98, Build B/Patch 1.3a
NSM	HP-UX 10.10	NCC 98, Build C
NPG	Solaris 2.5.1	NCC 98, Build C
WWW server	HP-UX 10.20	NCC 98, Build C
Firewall	Solaris 2.5.1	NCC 98, Build C
SCD	Linux 2.0.29	4.2
NTS	Unix 6.0	97.2.2

2.4 Archiving of Results

After a test item has been executed, a test record containing the following information is compiled and archived:

- Redlined test procedures
- Test data references
- Log entries of all test activity
- Delogs and display copies
- Copies of any PRs generated

The test records are labeled with the date the test was executed, and the tester/analyst evaluating the test results.

2.5 Final Status Summary

2.5.1 Test Item Summary

The final status of each individual integration test item, including the applicable build, test priority, actual start and completion dates, pass/fail status, and problem reports written, can be found in Appendix A. This section documents the final metrics collected for each Integration Test phase of NCC 98. The following table provides the test case status for each build of NCC 98:

Table 2-5. Integration Test Summary

Test Phase	# of Test Items Planned	# of Test Items Started	# of Test Items Completed
Build A	99	76	66
Build B	116	102	73
Build C	116	99	80
Total	331	277	219

Because the goal of Integration Testing was to assure the system was ready for System Testing, not all problems were fixed during the Integration Testing phase and so all test items could not be completed. However, any incomplete test items that verified functionality not covered in System Test items were rolled over to the System Test phase.

The following figures provide a graphical representation of the overall and detailed (# of test items started, passed, and failed) progress for each build of NCC 98 integration testing.

Figure 2-2. Build A – Integration Test Progress

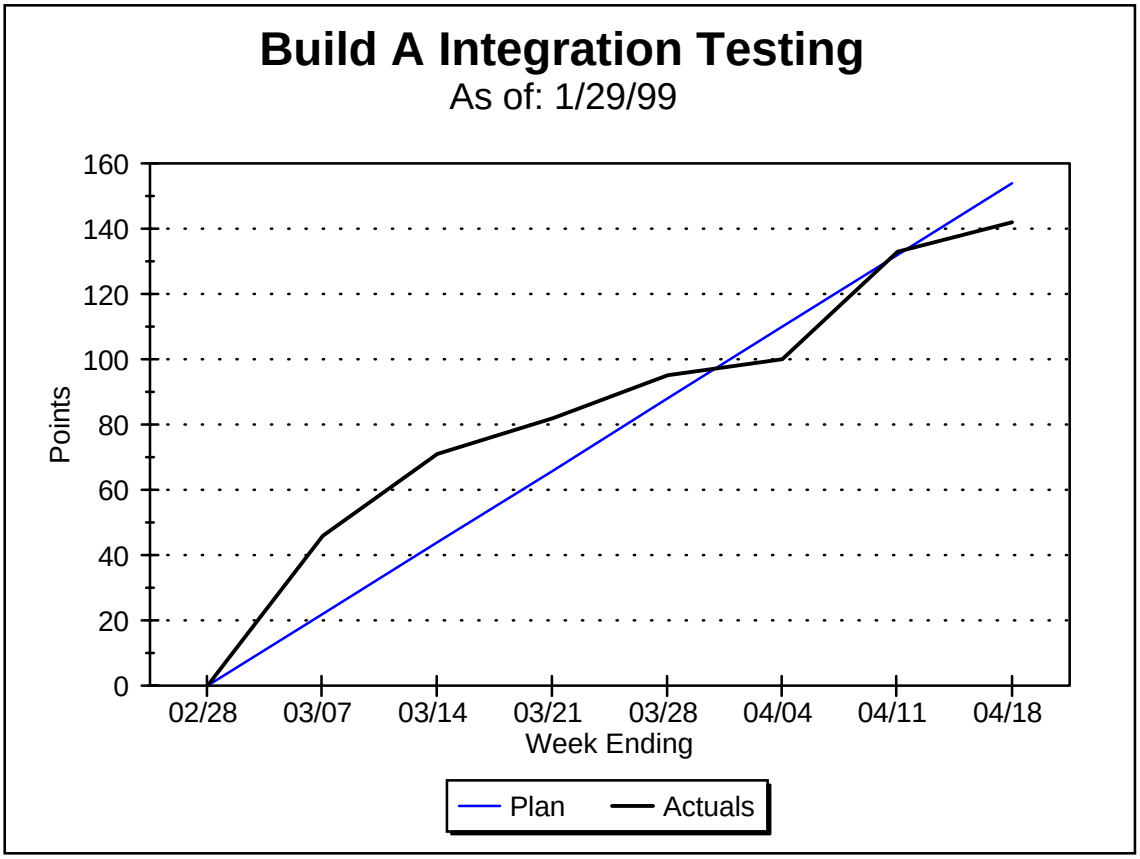
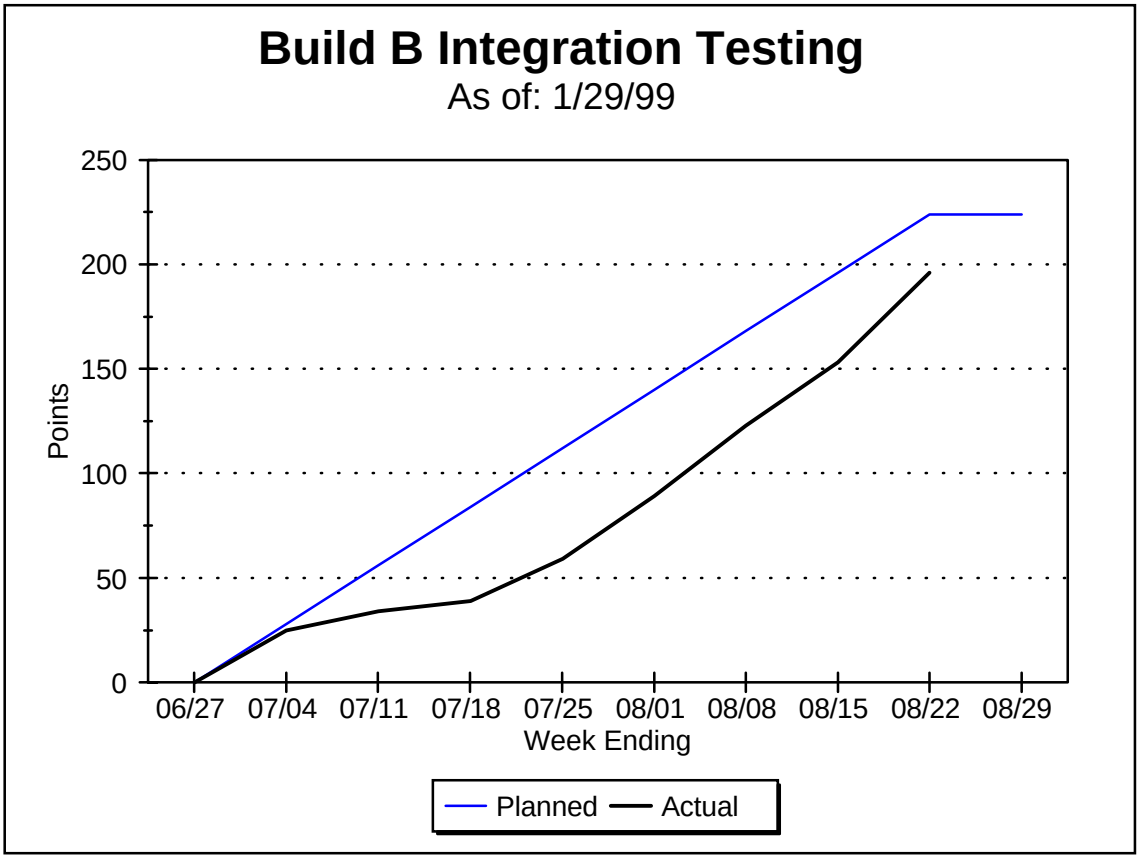


Figure 2-3. Build B – Integration Test Progress



3. Add the step “commit” to the SQL scripts provided in the test procedures if the script updates a table.

4. Continue to provide training to testers on the proper method for filling out the forms required to document the actions taken during test execution.

5. Continue to provide training to testers on the areas that are being introduced with the delivery of the system under test. Participate in the system integration process earlier in the life cycle and involve more of the testers. While it was certainly helpful to have a tester accompany the lead integrator during the integration of several key system components, inclusion in the process earlier would have provided additional insight into the tasks being performed and their backgrounds.

6. Plan for Integration Test team members to participate more fully in the system integration effort.

7. Continue with the increased use of e-mail to communicate between project members. Consider assigning testers a specific area of testing which they would follow from the planning through the execution stage. This would also provide a point of contact for other testers when problems in a specific functional area occurred.

8. In order to speed up the learning process, assign mentors to inexperienced testers and test in pairs until they can be independently productive.

9. Consider pairing less experienced testers with more experienced testers when beginning the test execution phase. This will provide the less experienced tester with an opportunity to observe and learn.

Section 3. System Testing

3.1 Test Case Content

The main objective of System Testing was to verify that NCC 98 met its requirements as documented in Revision 2 of the *NCC 98 System Requirements Document*. In order to accomplish this, the following test cases were identified:

Table 3-1. System Test Cases

Test Case	Name	Number of Test Items
NCC101	Readiness Checkout	2
NCC102	Service Planning Database	58
NCC103	Schedule Messages	48
NCC104	Scheduling Rules	37
NCC105	Scheduling Process	19
NCC106	Schedule Transmission	17
NCC107	Scheduling Displays	4
NCC109	Backwards Compatibility	6
NCC110	Acquisition Data Dissemination	28
NCC111	Reconfiguration of Ongoing Services	62
NCC112	Performance Data Dissemination	14
NCC114	Network Monitoring	1
NCC115	Postevent Activities	6
NCC116	NCC Console Operator Positions	3
NCC117	Operator/System Interface	2
NCC118	External Communications	3
NCC119	NCCDS Control	9
NCC122	Security	14
NCC123	Logger/Delogger	3
NCC133	Year 2000 Rollover	17
NCC134	Nascom TCP/IP Gateway	1
NCC137	TDRSS Unscheduled Time	7
	Total	361

Test objectives and detailed test procedures were developed for each test item. The detailed procedures for Builds A/B and C were documented in a Test Procedures document for each build, and were delivered to the NCC 98 web page.

In addition to the 361 test items identified above, seven test items from test case INCC102 were not completed during the Integration Test phase, and were rolled over to the System Test phase

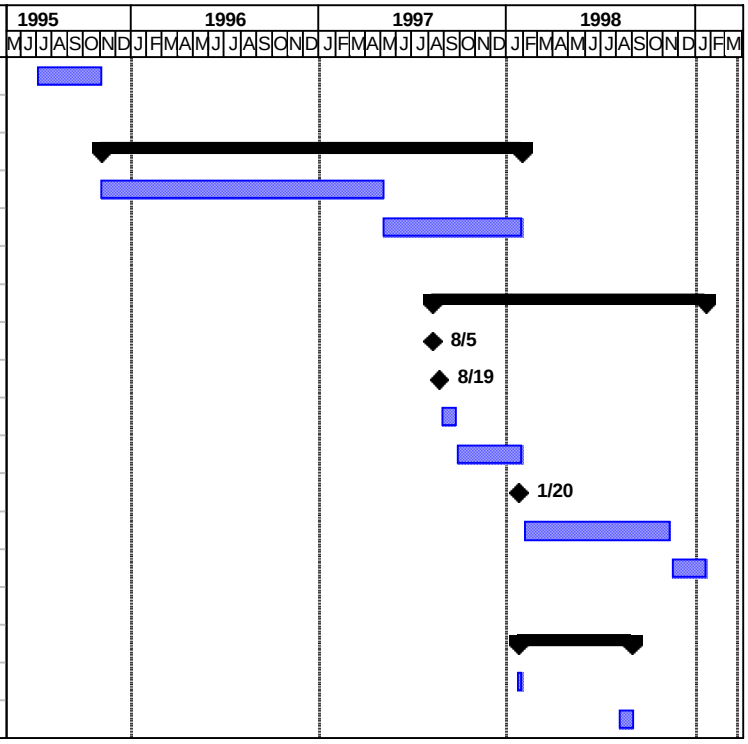
to be completed because the planned System Test items did not cover Exception Handling/Restart Recovery scenarios.

3.2 Test Schedule

The system testing was done in a modified two-build approach. System Test performed testing on CCS Build 2, then on SPSR Build C (consisting of sub-build 1.2 and 1.3), and then on the final NCC 98, Build C that include all the segments. After completion of functional testing of NCC 98, the system test team performed regression testing to verify that previously validated functionality had not been broken during more recent patch deliveries. Year 2000 validation was also performed during the system test phase. The high-level schedule of System Test activities is presented in the following figure.

Figure 3-1. System Test Activities Schedule

ID	Task Name	Start	Finish
1	System Test Plan	7/3/95	10/31/95
2			
3	**System Test Procedures**	**11/1/95**	**1/30/98**
4	Build A/B	11/1/95	5/2/97
5	Build C	5/5/97	1/30/98
6			
7	**System Test Execution**	**8/5/97**	**1/20/99**
8	Build A/B STRR	8/5/97	8/5/97
9	Build A/B Follow-up STRR	8/19/97	8/19/97
10	CCS Build A/B	8/25/97	9/19/97
11	SPSR Sub-build 1.2/1.3	9/25/97	1/30/98
12	Build C STRR	1/20/98	1/20/98
13	NCC 98 Build C	2/2/98	11/13/98
14	Regression Testing	11/16/98	1/20/99
15			
16	**Year 2000 Testing**	**1/19/98**	**8/31/98**
17	Phase 1	1/19/98	1/29/98
18	Phase 2	8/4/98	8/31/98



The completion of NCC 98 System Testing is documented in the NCC 98 System Test Completion Letter, dated November 30, 1998.

3.3 Test Environment and Configurations

3.3.1 CCS Build A/B

System testing of CCS Build A/B was performed in test berth 2 in the T&T in Building 13 at GSFC. The test configuration consisted of CCS4, T&T Server tsrv0, T&T Workstations 0-7, and NPG1. All segments were configured with NCC 98, Build B application software.

3.3.2 SPSR Sub-build 1.2/1.3

System testing of SPSR Sub-build 1.2/1.3 was performed in test berth 2 in the T&T in Building 13 at GSFC. The test configuration consisted of T&T Server tsrv0, T&T Workstations 0-7, and NPG1. The server and workstations were configured with SPSR, Patch 1.2/1.3 application software. The NPG was configured with NCC 98, Build B software.

3.3.3 NCC 98, Build C

Build C represented the final build of NCC 98, and so all components were included in the test environment. Build C integration testing was performed in both test berth 2 and test berth 3 in the T&T in Building 13 at GSFC. Only test berth 3 had the full NCC 98 configuration. Test berth 2 lacked a CCS, an NSM, and a WWW server. The final NCC 98 configuration is diagramed in Appendix B of this document.

3.4 Archiving of Results

The test record process was the same for System Test as it was for Integration Test. The test records were archived and will be used for future analysis, as comparison data for regression testing, and for reference during the planning and testing phases of subsequent releases.

3.5 Final Status Summary

3.5.1 Test Item Summary

The final status of each individual system test item, including test priority, actual start and completion dates, pass/fail status, and problem reports written, can be found in Appendix C. The following tables provide the breakdown of NCC 98 test items by priority and by segment. The Failure Rate documented in each table is determined by the number of test items that failed during the initial execution of the test.

Table 3-2. System Test Items by Priority

Priority	Total	# Started	# Passed	# Failed	# Waived	Failure Rate
High	270	270	251	0	19	39.3 %
Medium	98	98	94	0	4	21.4 %
Total	368	368	345	0	23	34.5 %

Table 3-3. System Test Items by Segment

Segment	# of Test Items Started	# of Test Items Passed	# of Test Items Failed	# of Test Items Waived	Failure Rate
ALL	2	2	0	0	50.0 %
CCS	95	90	0	5	21.1 %
NCD	2	2	0	0	0 %
NPG	7	7	0	0	0 %
NSM	12	7	0	5	58.3 %
SPSR	245	233	0	12	40.0 %
WWW	5	4	0	1	20.0 %
Total	368	345	0	23	34.5 %

The following table provides a summary of the NCC 98 Y2k test items (18 test items were originally planned, but one test item was related to a Candidate for Deferral and so was removed from the plan):

Table 3-4. Year 2000 Test Status

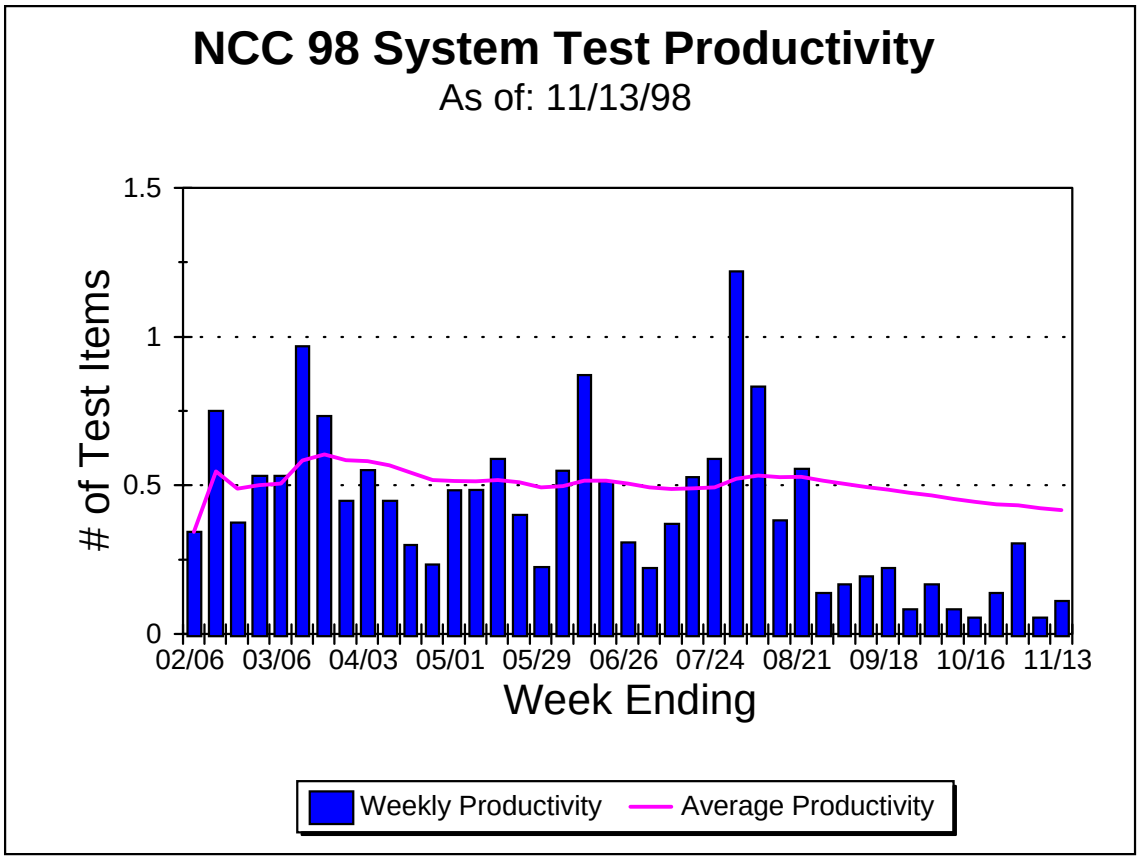
Priority	Total	# Started	# Passed	# Failed	# Waived	Failure Rate
High	17	17	17	0	0	11.8 %
Total	17	17	17	0	0	11.8 %

More detail on the results of Year 2000 validation is provided in Section 4 of this document.

System Testing of NCC 98, Build C experienced a productivity level of 0.42 test items per tester per week. Productivity levels during previous releases averaged 1.0 test items per tester per week. The low productivity level was attributed to the high failure rate (34.5%), as well as the

learning curve for the new technologies and requirements. The following chart illustrates the productivity level for System Test of Build C:

Figure 3-2. System Test Productivity



The following charts depict the system test progress during NCC 98 system testing:

Figure 3-3. System Test Progress - Rollup

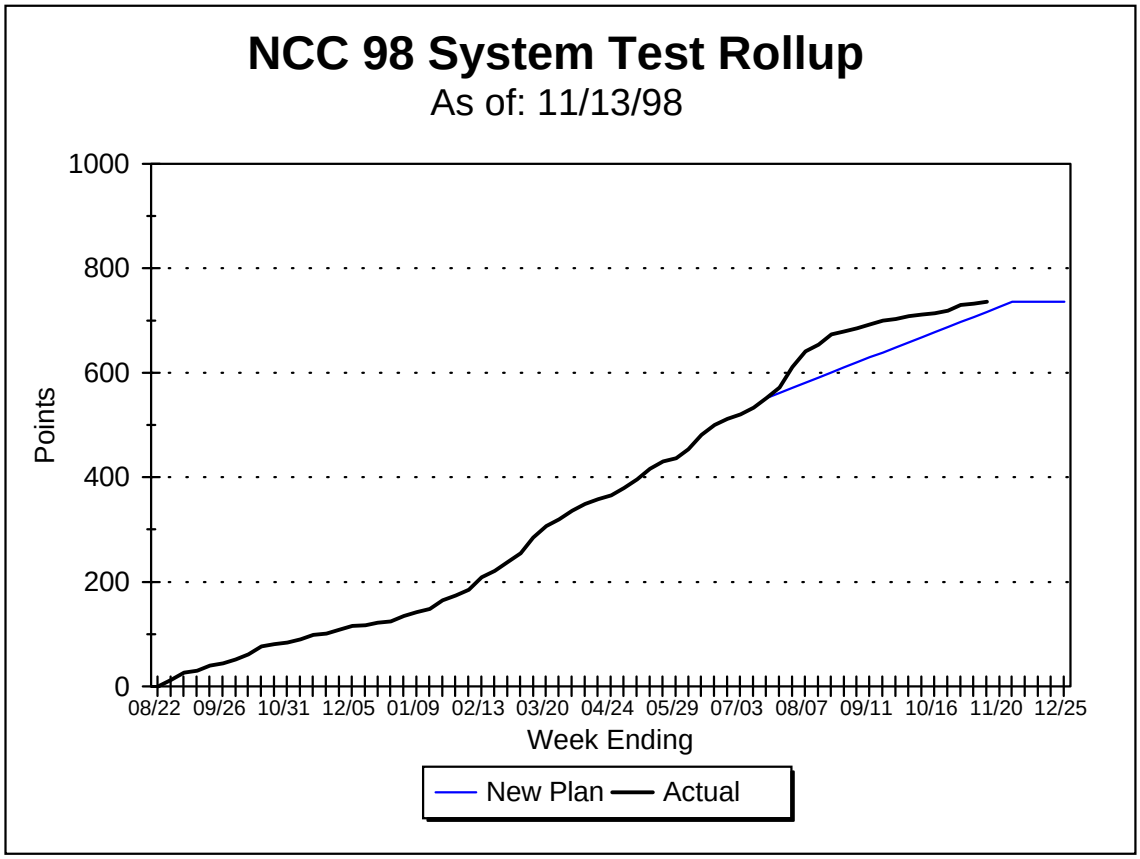
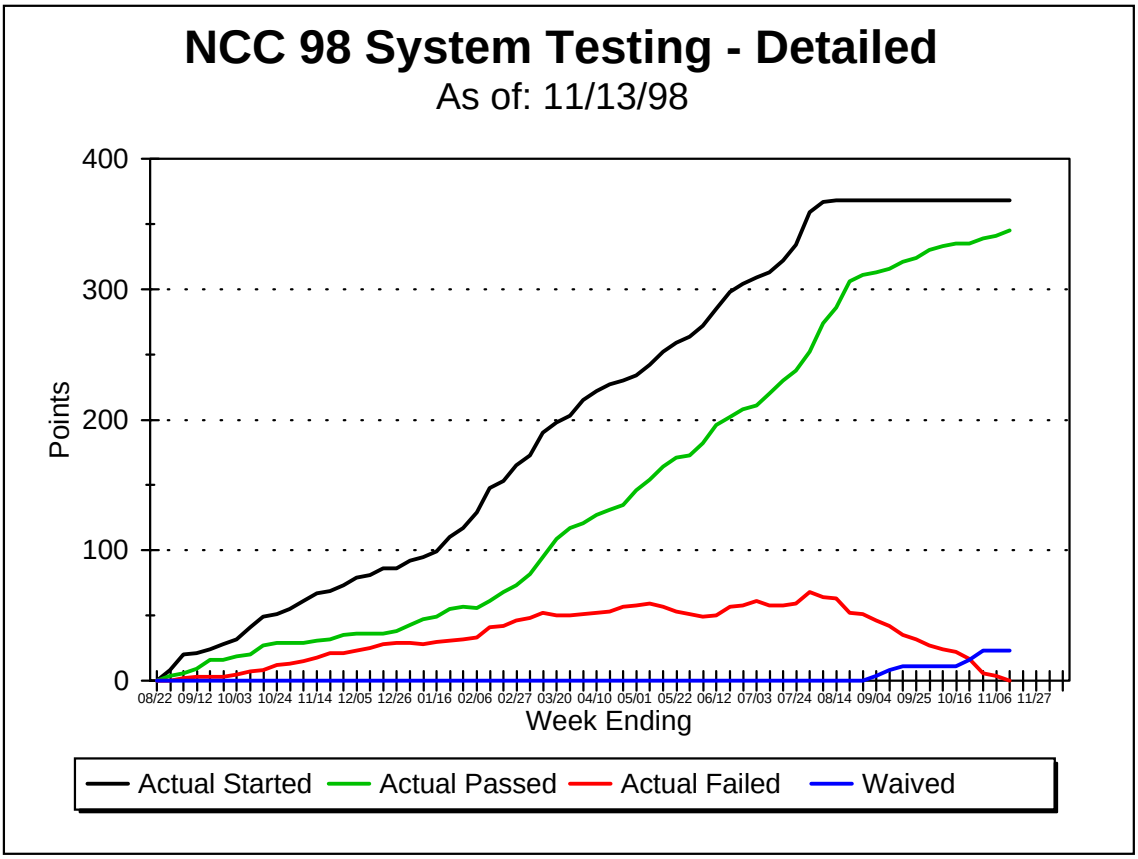


Figure 3-4. System Test Progress - Detailed



3.5.2 Problem Report Status

The following tables provide the number of PRs written, resolved, and verified during each build of system testing.

Table 3-5. Build A/B System Test Problem Reports

Segment	Number of PRs Written	Number of PRs Resolved	Number of PRs Verified
CCS	21	10	11
NPG	2	4	0
SPSR	11	0	3
SysAdmin	0	1	1
Total	34	15	15

Table 3-6. Build C System Test Problem Reports

Segment	Number of PRs Written	Number of PRs Resolved	Number of PRs Verified
CCS	47	60	94
Database	34	59	25
Firewall	6	7	5
NACC	1	0	0
NCD	13	12	12
NPG	20	32	32
NSM	20	18	20
NTS	1	2	2
SPSR	977	1091	556
SysAdmin	22	24	27
WWW Servr	9	14	14
Total	1150	1319	787

3.6 Lessons Learned

3.6.1 Assessments

The following are assessments of the NCC 98, Build A/B system testing phase:

1. Because the system test team was made up of employees from both Computer Sciences Corporation (CSC) and Allied Signal Technical Services Corporation (ATSC), coordinating procedure development was difficult until all the team members were located in one facility.

2. The NCC test procedures were posted on the NCC 98 web page. This made the procedures readily available when testers needed to go and reference information from the original document. In previous releases, a tester would have had to go to the office to retrieve the materials, resulting in the loss of test time.

3. System test received hands-on training from integration test team members during the final days of the integration test phase. This gave team members time to become familiar with the new hardware and software capabilities before the system test phase began. Integration testers also provided workarounds to known problems, making it easier for testers to continue when the same problems were encountered during the system test phase. The system test team also received SQL training from integration testers who had received formal SQL training.

4. Not all system testers attended UNIX and SQL training. Both courses were available through the GSFC Learning Center and offered through courses at GreenTec IV. Theoretically, System Testing should be black box testing, for which SQL would not be necessary. However, the system was not stable enough, and SQL queries and updates were a part of daily system test activities.

5. The test process was not always followed (e.g. test records were incomplete). Better training in this area is needed.

6. A 'Helpful Hints and Procedures' manual was created to document instructions for utilities, workarounds to problems, and other helpful-but-undocumented information. This manual provided the needed assistance that the standard User's Guides do not.

7. An electronic version of the Daily Test Summary (DTS) was used to report daily status. In previous releases, this was done using hand written notes, and it was not always delivered to the test lead in a timely fashion. The electronic version was helpful because testers could enter information and receive quicker responses to questions and issues related to test items. Also, the electronic DTS allowed for a wider distribution.

8. To better manage concurrent testing by multiple testers, a naming convention was added to keep Service Specification Codes (SSCs) unique. This was helpful because it allowed each tester to better manage their data. Before this enhancement, SSCs were mistakenly changed by other testers, which caused test results to change and become invalid. This prevented invalid problem reports from being written, and prevented unnecessary test item rework.

9. Test productivity was slowed when the system was not normalized after or during the execution of a test, in particular database subsystem tests. New testers did not realize the impact of their work on other testers.

10. Throughout NCC 98, patches frequently made the system unstable. A checkout of major system functionality was usually done to verify that nothing important had been broken. If a high priority problem existed that would impact further system test progress, a decision would be made as to whether to accept the patch into the system test baseline or not. A standard set of procedures was not developed, but would help in the future.

11. Test item folders were moved and some were lost because there was no established central location.

12. Test productivity was slower than anticipated, in part because there was not time for data preparation prior to the start of the test phase.

13. Test productivity was slower than anticipated, in part because there were not enough experienced testers on each shift and in each test berth.

14. Test productivity was slowed because Test Berth 3 was over-crowded due to the fact that other groups, such as system administrators and NSM development personnel, shared the same environment. This was especially true when other development personnel had to be called in to do problem analysis.

15. Lack of communication caused productivity to be slowed. For example, known problems were investigated more than once, all testers did not know about workarounds and procedures, system functionality/requirements were changed, but

not all testers were aware of the changes. This occurred in spite of the fact that information was e-mailed to all of the testers and to each test berth.

16. The Joint Process Improvement Committee (JPIC) was created during the test phase, and was successfully used to solve test-related issues and improve communication among team members. Problems documented were environment and resource problems, test procedure issues, and missed information. These issues were passed up the management chain and acted upon. This committee gave testers a voice in an environment that was already stressful to most test team members.

The following are assessments of the NCC 98, Build C system testing phase:

1. It was much easier for a tester who started a test item to finish it, unless the test failed during the early stages of the life cycle.
2. During build C, the test team was responsible for verifying a high volume of PRs. A central source was needed to track PRs, so a manual was created to keep the PRs where they would be easily accessible to testers. This kept testers from wasting time needed to research PRs that were available for system test checkout.
3. Based on the design of the system, some test items were redundant. When faced with time constraints, the system test team was able to recover schedule by streamlining some test items without jeopardizing the system test objectives.
4. System Test was faced with several occasions where testing was behind schedule, and so the test management team had to develop recovery plans. Some of the actions taken worked (e.g. streamlining test items), and others didn't (adding developers on a short team basis).
5. The Xrunner automated test tool was useful in verification of PRs related to memory leaks.

3.6.2 Recommendations

Based on the system testing of NCC 98, Build A/B, it is recommended that System Test:

1. Continue to provide team members office space in the same physical location, especially during the procedure development phase.
2. Continue to publish test procedures on the Web page.
3. In future releases, plan for formal training on the release functionality.
4. Require SQL and Unix training for all system testers, as well as any other courses that may possibly be applicable.
5. Develop a training session on System Test Methodology, and require this training for new team members.
6. Continue to maintain the Helpful Hints and Procedures manual.
7. Continue to use electronic DTSs.

8. Continue to follow an SSC assignment convention. Assign SSCs to new testers.
9. Ensure that all test items that may impact other testers include a clear warning. The warning should inform the tester that he/she might have to normalize the environment if the test is not completed in a single session. If the environment can not be normalized, this information must be communicated to the other team members.
10. Develop Patch Verification Procedures, and run these tests after the delivery of each patch.
11. Manage test item folders better and always keep them in a central location.
12. Ensure that time is allocated for data preparation (including NTS blocks and SSCs). During the data preparation phase, perform dry runs of the procedures, if possible.
13. Make better use of resources by equally scheduling testers in both test berths, and make sure experienced testers are evenly divided to help inexperienced testers when problems occur.
14. In the future, especially during the design phase of the equipment layout, the test management team should spend more time making the test suite as conducive to testing as possible.
15. Improve communication among team members by implementing the following:
    (a) Test Leads should either schedule a meeting or discuss the change with the tester responsible for testing the modified requirement.
    (b) Make sure all testers know when a workaround has been put in place by sending emails to the entire group. Update the Procedures manual with the change, when necessary.
    (c) Continue to send information e-mails to the test berths.
    (d) Make sure all test suites have white boards in place, and utilize them during shift change to communicate important information.
    (e) Make it part of each testers daily routine to read the previous day's DTS.
16. Maintain the JPIC.

Based on the system testing of NCC 98, Build C it is recommended that System Test:

1. Avoid re-assigning test items to different testers.
2. Continue to use a PR notebook as a central repository for PRs that are not related to test items. Consider possible ways to improve the efficiency of using this notebook.
3. When doing test planning for future release, consider system design in order to avoid redundant testing.

4. Develop generic System Test Recovery Guidelines to be referenced when system testing is behind schedule. The guidelines should be developed such that they would help to recover schedule for any release. Make suggestions as to how to recover quickly (e.g. streamline test run logs, skip lower risk steps, get less screen copies and delogs.) The guidelines must be developed in a way where critical problems are still documented. The guidelines should suggest what things work and what things may not work.

5. Continue to train testers on the Xrunner test tool, and use the tool for verification of memory leak PRs and for regression testing.

Section 4. Year 2000 Validation Testing

4.1 Testing Strategy

The responsibility for performing Year 2000 testing for NCC 98 belonged to the cNMOS GSA D.4 Joint Integration and System Test Team (JISTT). The JISTT formed one integrated test team to verify that NCC 98 is Year 2000 compliant.

Year 2000 testing was performed in multiple phases. Phase One, completed during the final two weeks of the NCC 98 Build C integration test phase, consisted of starting all of the tests items and identifying as many Year 2000 problems as possible. The dates to be tested were selected as per the *NASA Year 2000 Agency Test and Certification Guidelines and Requirements (Volume 1, July 2, 1998)* document, and are as follows:

1999/365 – 2000/001 rollover
2000/365 – 2000/366 rollover
2000/366 – 2001/001 rollover
1999/251 – 1999/252 rollover (rollover to 9/9/99)

Phase Two, completed during the month of August of 1998, was performed after resolutions were developed and delivered for the Year 2000 problems found during Phase One and other impacting problems. The dates to be tested were selected as per the *NASA Year 2000 Agency Test and Certification Guidelines and Requirements (Volume 1, July 2, 1998)* document, and are as follows:

1999/365 – 2000/001 rollover
2000/059 – 2000/060 rollover
2000/365 – 2000/366 rollover
2000/366 – 2001/001 rollover

4.2 Testing Methodology

Year 2000 test activities followed the NCC system test methodology as defined in the *Network Control Center Data System, 1998, System Test Plan*, dated October 1995.

4.3 Test Procedures

Eighteen tests were identified for Year 2000 validation of NCC 98. The tests are listed in Table 4-1. The detailed procedures are documented with the NCC 98, Build C Integration Test Procedures, and the NCC 98, Build C System Test Procedures, and can be found on-line at http://ncc98.gsfc.nasa.gov/doc-list/doctest.stm.

Table 4-1. Year 2000 Test Items

Test Item	Title
INCC119-C.01	Year 2000 - TDRS/SGLT Assignments
INCC119-C.02	Year 2000 - TDRS Resource Blocking
INCC119-C.03	Year 2000 - SGLT Resource Blocking
INCC119-C.05	Year 2000 - Schedule Request Data Retention
INCC119-C.06	Year 2000 - Event Data Retention
INCC119-C.07	Year 2000 - TSW Retention
INCC119-C.08	Year 2000 - Vector Data Retention
INCC119-C.09	Year 2000 - Alert Processing
NCC133-01	User Accounts
NCC133-02	SPSR Database Save
NCC133-03	Batch Processing
NCC133-04	Automatic Scheduling
NCC133-05	Real Time Processing
NCC133-06	Acq/Trk Processing
NCC133-07	Leap Year Processing
NCC133-08	CCS Database Save
NCC133-09	NSM
NCC133-10	September 9, 1999

Four Integration test items were identified for use in test item NCC133-09 as regression tests. The tests are listed in Table 4-2. The detailed procedures are documented with the NCC 98, Build C Integration Test Procedures, and can be found on-line at http://ncc98.gsfc.nasa.gov/doc-list/doctest.stm.

Table 4-2. Year 2000 NSM Regression Test Items

Test Item	**Title**
INCC103-C.17	NSM/Tsrv1 Interface
INCC103-C.18	NSM/Workstation Interface
INCC103-C.20	NSM-Monitor Tsrv1 Processes
INCC103-C.24	NSM Message Processing

4.4 Phase One Test Summary

4.4.1 Status Summary

Phase One of NCC 98 Year 2000 testing began on January 17, 1998 and concluded on January 29, 1998. Testing was performed in the T&T facility in GSFC Building 13, using Test Berth 2 and Test Berth 3.

Testing began daily at 9:00 a.m. From 6:00 a.m. to 9:00 a.m., the System Administration group was responsible for setting the time on all segments and performing any cleanup activities necessitated by the time change. A checklist was developed to help the System Administration and test groups consistently perform the setup activities daily. This checklist is included in Appendix D.

The controlled baseline used for Phase One consisted of the hardware and software configurations identified in Table 4-3.

Table 4-3. Phase One Test Configuration

Segment	Software
CCS	NCC 98, Build C
SPSR	Patch 1.3c
NCD	NCC 98, Release 1
NSM	Omniback II Version 2.5 HP OpenView ITO Version 3.01 HP NetMetrix/UX Version 4.7
WWW Server	NCC 98, Build C
NPG	NCC 98
Firewall	NCC 98, Build C
SCD	NCC 98, Build C
NTS	97.2.2

4.4.1.1 Test Item Status

All 18 of the Year 2000 test items were started. Of those, seven Passed, two Failed, and nine remained in progress. The items that failed uncovered problems that were related to the Year 2000. The items that remained in progress could not be completed due to non-Year 2000 problems.

Table 4-4 identifies each Year 2000 test item, its start and completion dates, Pass/Fail status, Year 2000 problem reports (PRs) written against it, and the PRs that impacted further progress.

Table 4-4. Test Item Summary

Test Item	Title	Start Date	Completion Date	Pass/ Fail	Y2K PRs	Impacting PRs
INCC119-C.01	Year 2000 - TDRS/SGLT Assignments	01/21/98	1/21/98	P		
INCC119-C.02	Year 2000 - TDRS Resource Blocking	01/21/98	1/21/98	P		
INCC119-C.03	Year 2000 - SGLT Resource Blocking	01/20/98	1/20/98	P		
INCC119-C.05	Year 2000 - Schedule Request Data Retention	01/29/98		*		
INCC119-C.06	Year 2000 - Event Data Retention	01/29/98		*		
INCC119-C.07	Year 2000 - TSW Retention	01/28/98		***		1705
INCC119-C.08	Year 2000 - Vector Data Retention	01/28/98		***		1647
INCC119-C.09	Year 2000 - Alert Processing	01/21/98	1/21/98	P		
NCC133-01	User Accounts	01/19/98	1/19/98	P		
NCC133-02	SPSR Database Save	01/22/98	1/22/98	P		
NCC133-03	Batch Processing	01/26/98		***		826, 1575, 1611, 1621
NCC133-04	Automatic Scheduling	01/19/98		***		826, 1611,1613, 1620
NCC133-05	Real Time Processing	01/21/98		F	1620	
NCC133-06	Acq/Trk Processing	01/19/98		***		1477, 1478
NCC133-07	Leap Year Processing	01/26/98		F	1632	1575, 1621, 1633
NCC133-08	CCS Database Save	01/22/98		**		
NCC133-09	NSM	01/22/98		**		
NCC133-10	September 9, 1999	01/29/98	01/29/98	P		

* Test item was not closed because data retention functionality for NCC 98 was not fully tested at the time of Year 2000 testing.

** Test item was not completed because of additional research needed on the impact of database backups/recoveries to the system.

*** Test item was not completed because of impacting problems.

4.4.1.2 Problem Report Status

Two Year 2000 PRs were written during Phase One testing. They are listed in Table 4-5.

Table 4-5. Year 2000-related Problem Reports

PR #	Priority	Segment	Problem Description	Test ID
1632	2	WWW	If an SA event is scheduled on day 366, the TUT, TDRSS unscheduled time, that is available around the event does not show for 366 day of year.	NCC133-07
1620	2	CCS	CCS does not receive events after the year 2000 rollover.	NCC133-05

In addition, two Year 2000 PRs were written against the NCC Test System (NTS), a tool that is used to simulate the external entities. They are listed in Table 4-6.

Table 4-6. Other Year 2000 Problems

PR #	Priority	Segment	Problem Description
1588	2	NTS	Timeline/Year 2000: Executed a timeline to start on 01/01/2000. The timeline would than increase the start time of each subsequent event by 20 minutes. The first request was properly scheduled. However, the start time was increased in a random but increasing manner that spanned over 10 years for a timeline of three events. It seems that NTS is not calculating the event start time properly past the year 2000.
1671	3	NTS	Year 2000 times cannot be set on NTS with the Unix date command (year defaults to 1971). This affects logfile times and timeline execution. Workaround for Y2K rollover is to set time in December 1999 and NTS system time will rollover to proper Y2K time. This workaround does not work for Leap Year 2000 (December 2000) testing, since all times are > Dec 31, 1999.

4.4.2 Future Activities

Those test items that were not completed during Phase One due to Year 2000 and non-Year 2000 problems were deferred to Phase Two testing.

4.5 Phase Two Test Summary

Phase Two of NCC 98 Year 2000 testing began on August 4, 1998 and concluded on August 31, 1998. Testing was performed in the T&T facility in GSFC Building 13, using Test Berth 3. Phase Two testing consisted of executing all of the test items not Passed during Phase One.

As in Phase One, Phase Two testing began daily at 9:00 a.m. From 6:00 a.m. to 9:00 a.m., the System Administration group was responsible for setting the time on all segments and performing any cleanup activities necessitated by the time change.

The controlled baseline used for this test phase was the same as that used for Build C System Testing. This configuration is identified in Appendix B.

4.5.1 Test Item Status

Of the 11 test items that did not pass during Phase One testing, 10 were retested and passed during Phase Two, and one test item was removed because the functionality was deferred to a completion release.

Table 4-7 identifies each Year 2000 test item, its start and completion dates, and its Pass/Fail status.

Table 4-7. Test Item Summary

Test Item	Title	Start Date	Completion Date	Pass/ Fail
INCC119-C.05	Year 2000 – Schedule Request Data Retention	01/29/98	08/06/98	P
INCC119-C.06	Year 2000 – Event Data Retention	01/29/98	08/06/98	P
INCC119-C.07	Year 2000 – TSW Retention	01/28/98		*
INCC119-C.08	Year 2000 – Vector Data Retention	01/28/98	08/06/98	P
NCC133-03	Batch Processing	01/26/98	08/20/98	P
NCC133-04	Automatic Scheduling	01/19/98	08/21/98	P
NCC133-05	Real Time Processing	01/21/98	08/07/98	P
NCC133-06	Acq/Trk Processing	01/19/98	08/19/98	P
NCC133-07	Leap Year Processing	01/26/98	08/31/98	P
NCC133-08	CCS Database Save	01/22/98	08/21/98	P
NCC133-09	NSM Database Save	01/22/98	08/21/98	P

* Test item was removed because the TSW functionality was deferred to a future release.

Appendix E lists each objective for the Year 2000 tests along with the final status of Verified or Not Verified, and any necessary explanations.

4.5.2 Problem Report Status

No Year 2000 problems were encountered during Phase Two testing of the NCC 98.

Table 4-8 identifies the Year 2000 PRs submitted during Phase One, the dates on which the fix for each PR was delivered, and the date on which the fix was verified by the test team. Note that PRs written against the NTS are not included, since the NTS is a test tool that is not part of NCC 98.

Table 4-8. Year 2000 Problem Reports

PR #	Fix Delivery Date	Verification Date
1620	02/05/98	08/06/98
1632	02/26/98	08/26/98

In addition, three NCC Change Requests (NCRs) were submitted, approved, and implemented, between the end of Phase One testing and the beginning of Phase Two testing. These were to upgrade three COTS products on NSM with Year 2000 compliant versions. These NCRs were verified by performing the planned NSM Year 2000 testing. No problems were noted.

Appendix A. Integration Test Items

This appendix contains a listing of all the test items planned for Integration Testing of each build of NCC 98. A waiver was approved by project management for any items not complete by start of System Testing of each build.

Each test item was assigned a priority: High (H), Medium (M), or Low. The Low priority test items were not planned to be executed during any Integration Test phase.

Pass/fail status was not recorded until Build C, so this column is left blank for the Build A and Build B test items. A test item was not Passed (P) until all PRs written against the Pass/fail criteria were resolved and verified.

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC101-B1.01	SPSR Startup	A	H	3/25/97	4/18/97		
INCC101-B1.02	CCS Startup	A	H	3/11/97	4/8/97		7, 8, 9, 131
INCC101-B1.03	Workstations	A	H	3/25/97	4/7/97		61, 62
INCC101-B1.04	NSM Startup	A	H	3/11/97	3/11/97		
INCC101-B1.05	CCS/SPSR/Workstation Interfaces	A	H	3/3/97	3/4/97		
INCC101-B1.05	CCS/SPSR/Workstation Interfaces ***Post OBU	A	H	3/28/97	4/18/97		
INCC101-B1.06	CCS/SPSR Data Base Interface	A	H	3/3/97	3/28/97		103, 104, 144
INCC101-B1.07	NSM-CCS/SPSR/Workstation Interfaces	A	H	3/3/97	4/18/97		151, 161, 162
INCC101-B1.08	INPG-CCS/SPSR Interfaces	A	H	3/5/97	3/26/97		111
INCC101-B1.09	CCS Warm Start	A	M	3/6/97	4/8/97		36
INCC102-B1.01	Data Base Deadlocks/Rollbacks	A	H				
INCC102-B1.02	SPSR Failure During Receipt of Messages	A	M				
INCC102-B1.03	CCS Failure During Receipt of Messages	A	M				
INCC102-B1.04	LAN Failure During Receipt of SPSR Messages	A	M				
INCC102-B1.05	LAN Failure During Receipt of CCS Messages	A	M				
INCC102-B1.06	Workstation Failure	A	M				
INCC102-B1.07	CCS Failure During Transmission of Messages	A	M				
INCC102-B1.08	SPSR Failure During Transmission of Messages	A	M				
INCC105-B1.01	Main Panel	A	M	3/6/97	3/6/97		21
INCC105-B1.01	Main Panel ***Post OBU	A	M	4/7/97	4/7/97		
INCC105-B1.02	Multiple Windows at One Workstation	A	M	3/3/97			
INCC105-B1.03	Simultaneous Data Base Updates	A	H				
INCC105-B1.04	Data Base List Updates - Valid SUPIDEN & TDRS Window	A	H				
INCC105-B1.05	Data Base List Updates - Inhibit/Enable Transmission Destionations Window	A	H				
INCC107-B1.01	SPSR/CCS-UTC Interface	A	H	3/20/97			115
INCC107-B1.02	Operator Alerts Window	A	H	3/27/97	4/18/97		72, 73, 141, 142, 143, 160
INCC107-B1.03	Create Operator Groups	A	H	3/25/97	4/3/97		
INCC107-B1.04	Assign Windows to Groups	A	H	4/7/97	4/11/97		
INCC108-B1.02	Operator Interface - Space Network Data	A	M	3/3/97	3/3/97		97
INCC108-B1.03	Space Network Summary Window - GT	A	H	3/3/97	3/3/97		

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC108-B1.04	Space Network Summary Window - TDRS	A	H	3/3/97	3/6/97		37
INCC108-B1.05	Space Network Summary Window - MDM	A	H	3/4/97	3/12/97		39
INCC108-B1.06	Space Network Summary Window - HDRM	A	H	3/3/97	3/3/97		
INCC108-B1.08	SGLT Resource Availability Window	A	H	4/11/97	4/14/97		117, 118, 119, 120
INCC108-B1.10	TDRS Configuration Window	A	H	3/11/97	4/11/97		154
INCC108-B1.12	TDRS Operational Names And Mappings Window	A	H				
INCC108-B1.13	MDM Capacities Window	A	H				
INCC108-B1.15	HDRM Capacities Window	A	H				
INCC109-B1.02	Operator Interface - Customer Data	A	M	3/4/97	3/6/97		53, 100
INCC109-B1.03	Customer Database Window	A	M	3/4/97	3/4/97		87
INCC109-B1.04	SIC Editor Window	A	H	3/3/97	3/10/97		
INCC109-B1.06	Schedule Distribution List Window	A	H	3/7/97	4/4/97		164
INCC109-B1.08	Nascom Parameters Window	A	H	3/6/97	3/6/97		
INCC109-B1.10	Customer Information Window	A	H				
INCC109-B1.12	Valid Customer SUPIDENs and TDRSs Window	A	H				
INCC109-B1.14	Data Quality Monitoring Parameters Window	A	H	3/12/97	3/12/97		64, 65, 66, 67, 68, 69, 70
INCC109-B1.16	Customer User Interface Channels Window	A	H	3/3/97	3/3/97		19, 41
INCC109-B1.18	Level of Support Window	A	H	3/4/97	3/11/97		
INCC109-B1.20	Customer Services Window	A	H	3/7/97	3/7/97		
INCC109-B1.22	Schedulable Parameters Window	A	H	4/7/97	4/9/97		132, 133, 134
INCC109-B1.24	Prototype Events Window	A	H				
INCC109-B1.26	Mission Priorities Window	A	M	3/11/97	3/11/97		
INCC110-B1.01	Valid SARs/SRMs 99/10, 99/02	A	H	3/12/97	3/18/97		112, 149
INCC110-B1.02	Invalid SARs/SRMs 99/10, 99/02	A	M				82, 84, 86, 108, 109
INCC110-B1.03	Valid Alternate SARs/SRMs 99/21, 99/02	A	H	3/10/97	3/31/97		
INCC110-B1.05	Valid Replace Requests/SRMs 99/12 , 99/02	A	H	3/14/97	3/20/97		76, 77, 79
INCC110-B1.07	Valid TSWs 99/25	A	H	3/3/97	3/21/97		
INCC110-B1.09	Partially Valid/Overlapping/Empty TSWs 99/25	A	M	3/10/97	3/17/97		
INCC110-B1.10	Valid Delete Requests 99/11	A	H	3/10/97	4/18/97		
INCC110-B1.12	Valid Wait-List Requests/SRMs 99/24, 99/02	A	H	3/12/97	4/8/97		
INCC111-B1.01	Boundary Between Batch and Automatic Scheduling Subphases	A	H	3/26/97			

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC114-B1.01	CCS Startup - SIC Updates	A	H	3/4/97	4/8/97		
INCC114-B1.02	CCS Startup - TDRS Assignment Updates	A	M				
INCC114-B1.03	CCS Startup - DQM Parameter Updates	A	M				
INCC114-B1.04	CCS Startup - Authorized Users Updates	A	M	4/3/97	4/9/97		122
INCC114-B1.05	Automatic Updates - SIC Data	A	M	4/11/97	4/14/97		
INCC114-B1.06	Automatic Updates - TDRS Mapping	A	H				
INCC114-B1.07	Automatic Updates - DQM Parameters	A	H	4/10/97	4/10/97		
INCC114-B1.08	Automatic Updates - Authorized Users	A	H	3/6/97	4/3/97		106
INCC114-B1.19	CCS Review Events - Selection Criteria	A	M	4/7/97	4/7/97		24
INCC114-B1.20	CCS Review Events - Color Coding	A	M	4/11/97	4/17/97		
INCC115-B1.02	Operator Interface ***Post OBU	A	M	4/3/97	4/3/97		
INCC115-B1.03	Removal of Obsolete Software	A	M	3/4/97	3/11/97		
INCC115-B1.04	Network Site Status	A	H	4/3/97	4/8/97		50
INCC115-B1.05	CCS DBA Utility	A	M	3/6/97			
INCC116-B1.02	Operator Interface - Scheduling Control Data/Edit SAR Windows	A	M	3/3/97			54, 55, 57, 58
INCC116-B1.03	Schedule Maintenance Control Parameters Window: Enable Editing	A	H	3/4/97	3/4/97		
INCC116-B1.04	Schedule Maintenance Control Parameters Window: Alert Period Parameters	A	H	4/7/97	4/7/97		124
INCC116-B1.05	Schedule Maintenance Control Parameters Window: Schedule Boundary Parameters	A	H	3/3/97			22, 56, 146
INCC116-B1.07	Data Retention and Purge - Schedule Requests	A	H	3/25/97	4/9/97		92, 135
INCC116-B1.08	Data Retention and Purge - TSWs	A	H				
INCC116-B1.10	Scheduling Priorities Lists Window	A	H	3/21/97			
INCC116-B1.11	Schedule Requests Window	A	H	3/25/97			153
INCC116-B1.13	Edit SAR Window - Valid SARs	A	H	3/10/97			74, 81, 83, 96, 137
INCC116-B1.14	Edit SAR Window - Valid ASARs	A	H				
INCC116-B1.15	Edit SAR Window - Valid Replace Requests	A	H	3/10/97			
INCC116-B1.16	Edit SAR Window - Invalid Requests	A	M	3/17/97	4/11/97		155, 156
INCC116-B1.17	Edit Service Window	A	M	3/11/97	3/26/97		85, 91
INCC116-B1.18	Edit SAR Window - Modify Parameters	A	M	3/12/97	4/9/97		152
INCC116-B1.19	Edit Delete Request Window	A	M	3/17/97	3/19/97		71

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC116-B1.20	Edit Wait - List Request Window	A	M	3/5/97	3/10/97		163
INCC117-B1.01	Operator Interface	A	M	3/5/97	3/10/97		
INCC117-B1.01	Operator Interface ***Post OBU	A	M	4/3/97	4/9/97		126, 127
INCC118-B1.01	Operator Interface	A	M	3/3/97	4/1/97		107
INCC118-B1.03	UPD Request Summary Window	A	H	4/8/97	4/14/97		48, 116, 139
INCC118-B1.04	TDRS Summary Menu	A	H	3/31/97	4/11/97		
INCC118-B1.05	TDRS Summary Window	A	H	4/7/97	4/11/97		
INCC118-B1.06	ODM Window	A	H	3/11/97	4/11/97		101, 102, 114, 129
INCC118-B1.07	Performance Data - Event Termination	A	H	3/28/97	4/7/97		
INCC101-B1.01	SPSR Startup	B	H	6/30/97	8/13/97		613
INCC101-B1.02	CCS Cold Start	B	H	6/30/97	6/30/97		131, 480
INCC101-B1.04	Workstation DTT0	B	H	6/30/97	6/30/97		509, 510, 523
INCC101-B1.05	Workstation DTT1	B	H	6/30/97	6/30/97		345, 352
INCC101-B1.06	Workstation DTT2	B	H	6/30/97	6/30/97		
INCC101-B1.07	Workstation DTT3	B	H	6/30/97	7/1/97		
INCC101-B1.08	Workstation DTT4	B	H	6/30/97	7/3/97		349
INCC101-B1.09	Workstation DTT5	B	H	6/30/97	7/3/97		
INCC101-B1.10	Data Base Access	B	H	7/9/97	8/1/97		
INCC101-B1.11	NSM Interfaces	B	H	6/30/97	8/15/97		350, 351, 533, 609, 611, 617
INCC101-B1.12	NPG Startup	B	H	6/30/97	7/11/97		377, 448
INCC101-B1.13	Workstation DTT6	B	H	7/1/97	7/3/97		344
INCC101-B1.14	Workstation DTT7	B	H	7/1/97	7/3/97		360
INCC105-B1.01	Simultaneous Data Base Updates	B	H	8/6/97			245, 534
INCC105-B1.02	Data Base List Updates - Valid SUPIDEN & TDRS Window	B	H	8/5/97	8/5/97		
INCC105-B1.03	Data Base List Updates - Inhibit/Enable Transmission Destinations Window	B	H	8/15/97	8/18/97		
INCC105-B1.05	Alert Processing	B	H	8/20/97			635, 636, 637, 638
INCC107-B1.01	SPSR/CCS-UTC Interface	B	H	7/11/97			407, 408
INCC107-B1.02	Operator Alerts Window	B	H	7/3/97			211, 354, 366, 383, 507, 568, 576
INCC107-B1.03	Assign Windows to Groups	B	H	8/5/97			524, 539, 552, 563

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Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC107-B1.05	SPSR External Message/Debug Log Server	B	H	8/19/97	8/20/97		235, 385
INCC107-B1.06	Alert Filter Window	B	H				374, 388
INCC107-B1.07	Assign Alerts to Groups	B	H	7/23/97			391, 520
INCC107-B1.08	Information Alert Filtering	B	H				
INCC107-B1.09	Operator SOTC1	B	H	8/22/97	8/22/97		
INCC107-B1.10	Operator SOTC8	B	H	8/22/97	8/22/97		
INCC108-B1.01	TDRS Configuration Window	B	H	7/30/97			298, 482, 518, 577
INCC108-B1.02	TDRS Operational Names And Mappings Window	B	H	7/24/97	7/24/97		476, 477, 501
INCC108-B1.03	MDM Capacities Window	B	H	7/22/97	7/23/97		195, 473, 488, 489
INCC108-B1.04	HDRM Capacities Window	B	H	7/22/97	7/24/97		537
INCC108-B1.06	GT Configuration Window	B	H	8/7/97	8/7/97		580
INCC108-B1.07	TDRS Resource Detail Window	B	H	7/25/97	7/25/97		494, 496
INCC108-B1.08	TDRS Sets Window	B	H	8/12/97	8/12/97		
INCC108-B1.09	User Interface Channels Windows	B	H	8/14/97	8/14/97		208, 320, 581, 652, 653, 654, 656
INCC108-B1.10	Valid Destinations Window	B	H	8/20/97	8/20/97		625
INCC108-B1.11	Transmission Control Parameters Window	B	H	8/20/97	8/20/97		397
INCC108-B1.12	TDRS Operational Name/TDRS ID/SGLT Mappings	B	H	7/9/97	7/29/97		437, 438, 451
INCC109-B1.02	Customer Information Window	B	H	7/31/97	7/31/97		236, 525
INCC109-B1.03	Valid Customer SUPIDEN and TDRS Window	B	H	7/9/97	7/10/97		396, 526, 527, 665
INCC109-B1.04	Service Specification Codes (SSCs) Window	B	H	7/24/97	7/24/97		513
INCC109-B1.05	Schedulable Parameters Windows - Add SMAR	B	H	8/21/97	8/21/97		521, 543, 620, 621, 622
INCC109-B1.06	Schedulable Parameters Windows - Copy KuSAR	B	H	8/20/97	8/21/97		175
INCC109-B1.07	Schedulable Parameters Windows - Modify Tracking	B	H	7/29/97	7/31/97		545
INCC109-B1.08	Prototype Events Window	B	H	7/28/97	7/29/97		302
INCC109-B1.09	Mission Priorities Window	B	H	8/22/97	8/22/97		
INCC109-B1.10	Service Parameter Records Window - Parameter Record Overrides	B	H				483, 484, 546, 610
INCC109-B1.11	Service Parameter Records Window - Service Defaults	B	H	7/10/97	8/20/97		434, 435, 485, 486, 517, 530, 544, 547, 660

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Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC109-B1.12	CCS User IDs and Password Window	B	H	7/16/97			446, 454, 455, 460, 463, 464, 467
INCC109-B1.13	SIC Editor Window - Copy Function	B	H	8/20/97	8/22/97		
INCC110-B1.01	Valid SARs/SRMs 99/10, 99/02 - Automatic Scheduling Subphase	B	H	7/3/97	7/25/97		423
INCC110-B1.02	Invalid SARs/SRMs 99/10, 99/02 - Automatic Scheduling Subphase	B	H	8/18/97	8/20/97		086
INCC110-B1.03	Valid Alternate SARs/SRMs 99/21, 99/02 - Automatic Scheduling Subphase	B	H	7/24/97	8/7/97		
INCC110-B1.04	Valid Replace Requests/SRMs 99/12 , 99/02 - Automatic Scheduling Subphase	B	H	8/19/97			79
INCC110-B1.05	Valid Delete Requests 99/11 - Automatic Scheduling Subphase	B	H	8/12/97	8/12/97		583
INCC110-B1.06	Valid Wait-List Requests/SRMs 99/24, 99/02 - Automatic Scheduling Subphase	B	H	7/25/97			
INCC110-B1.07	Valid SARs/SRMs 99/10, 99/02 - Batch Scheduling Subphase	B	H	7/17/97	8/5/97		
INCC110-B1.09	Valid Alternate SARs/SRMs 99/21, 99/02 - Batch Scheduling Subphase	B	H	7/17/97	8/7/97		556, 557, 558
INCC110-B1.10	Valid Replace Requests/SRMs 99/12 , 99/02 - Batch Scheduling Subphase	B	H				
INCC110-B1.11	Valid Delete Requests 99/11 - Batch Scheduling Subphase	B	H	8/13/97			472, 599
INCC110-B1.12	Valid Wait-List Requests/SRMs 99/24, 99/02 - Batch Scheduling Subphase	B	H	8/5/97	8/8/97		390, 538
INCC111-B1.01	Boundary Between Batch and Automatic Scheduling Subphases	B	H	8/11/97			582, 602
INCC111-B1.02	Valid Automatic Schedule Updates - Operator Requests	B	H	8/8/97			096, 598
INCC111-B1.03	Invalid Automatic Schedule Updates - Operator Requests	B	H	8/8/97			553, 554
INCC111-B1.04	Valid Automatic Schedule Updates - Customer Requests	B	H	8/11/97			
INCC111-B1.07	Operator-Initiated Schedule Delete Requests	B	H	8/12/97	8/12/97		646, 647

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Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC111-B1.08	Customer-Initiated Schedule Delete Requests	B	H	8/8/97			585, 589
INCC111-B1.09	Boundary Between Schedule Generation and Active Periods	B	H	8/22/97			
INCC111-B1.10	Schedule Activation	B	H	8/7/97	8/7/97		560
INCC111-B1.11	Schedule Activation - Wait-List Requests	B	H	8/21/97	8/21/97		
INCC111-B1.12	Automatic Scheduling - Conflict Resolution	B	H	8/7/97			591, 619
INCC111-B1.13	Automatic Scheduling - Data Base Changes	B	H	8/15/97			624, 626, 627
INCC111-B1.14	Operator-Initiated Freeze Requests	B	H				
INCC111-B1.15	Active Schedule Lockout	B	H	8/14/97	8/21/97		603
INCC111-B1.17	Batch Scheduling - with Conflicts	B	H				
INCC111-B1.18	Batch Scheduling - Operator & Customer Requests	B	H				
INCC111-B1.19	Batch Scheduling - Event Start Time Tolerance	B	H	8/11/97			648, 650, 651, 655, 662
INCC111-B1.20	Batch Scheduling - Service Start Time Tolerance	B	H	8/1/97	8/1/97		452
INCC111-B1.21	Batch Scheduling - TDRS Selection	B	H				
INCC111-B1.22	Batch Scheduling - SA Antenna Selection	B	H	8/5/97	8/5/97		540
INCC111-B1.23	Batch Scheduling - Service Duration Flexibility	B	H	8/7/97	8/7/97		
INCC111-B1.24	Batch Scheduling - Alternate SARs	B	H	8/14/97			
INCC111-B1.25	Batch Scheduling - Replace Requests	B	H	8/21/97			
INCC113-B1.01	Receive Valid Vectors 03/10	B	H	8/8/97	8/22/97		578, 657
INCC113-B1.03	Receive Valid Maneuver Sequences 03/15	B	H	8/15/97	8/20/97		633, 639, 661
INCC114-B1.02	CCS Startup - TDRS Assignment Updates	B	H	8/7/97	8/7/97		
INCC114-B1.04	CCS Startup - Authorized Users Updates	B	H	8/8/97	8/14/97		
INCC114-B1.06	Automatic Updates - TDRS Mapping	B	H	7/25/97	7/25/97		
INCC114-B1.10	CCS Startup - Event Data Updates	B	H	7/23/97			474, 506, 584, 592
INCC114-B1.11	CCS Startup - Event Deletions	B	H				
INCC114-B1.13	Automatic Updates - Event Data	B	H				
INCC114-B1.14	Automatic Updates - Event Deletions	B	H				
INCC114-B1.16	Full Data Exchange	B	H	8/8/97	8/15/97		
INCC114-B1.17	CCS Alert Client	B	H	8/20/97	8/20/97		631
INCC115-B1.03	Manual Communication Test Blocks	B	H	7/23/97	8/14/97		342, 586, 587, 588

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC116-B1.03	Schedule Maintenance Control Parameters Window: Alert Period Parameters	B	H	7/30/97			297
INCC116-B1.04	Schedule Maintenance Control Parameters Window: Schedule Boundary Parameters	B	H	8/1/97	8/1/97		297, 343, 508
INCC116-B1.05	Data Retention and Purge - Schedule Requests	B	H				
INCC116-B1.06	Data Retention and Purge - TSWs	B	H				
INCC116-B1.07	Scheduling Priorities Lists Window	B	H	8/11/97	8/11/97		293, 458, 564, 565
INCC116-B1.08	Schedule Requests Window	B	H	8/22/97	8/22/97		440, 447, 500, 616
INCC116-B1.09	Edit SAR Window - Valid SARs	B	H	8/12/97	8/18/97		532, 601, 612
INCC116-B1.10	Edit SAR Window - Valid ASARs	B	H	8/14/97			614, 632
INCC116-B1.11	Edit SAR Window - Valid Replace Requests	B	H	8/19/97			
INCC116-B1.23	View/Update Times/Copy TSWs	B	H	7/31/97	7/31/97		470, 497, 498, 531
INCC116-B1.24	Add/Modify/Remove TSWs	B	H	7/30/97	7/30/97		604
INCC116-B1.25	TSW Updates	B	H	7/29/97	7/29/97		
INCC117-B1.01	GCM Menu Window	B	H	7/17/97	7/31/97		514, 515
INCC117-B1.02	Valid Operator-Initiated SRR with DQM Parameters	B	H	8/5/97			283, 559, 561, 567
INCC117-B1.04	Valid User-Initiated GCMR	B	H	7/29/97			284, 516, 536
INCC117-B1.06	OPM Status (03/62) - GT Rejects	B	H	8/1/97	8/1/97		
INCC117-B1.07	OPM Status Time-out Value	B	H	7/16/97	7/31/97		507, 511, 659
INCC117-B1.08	Retain OPM Status Time-out Value After CCS Cold Start	B	H	8/8/97	8/8/97		529
INCC118-B1.01	UPD Request Summary Window	B	H	7/2/97	8/7/97		363, 491, 492, 529
INCC118-B1.02	TDRS Summary Menu	B	H	7/29/97	7/31/97		640
INCC118-B1.03	TDRS Summary Window	B	H	8/5/97			649
INCC118-B1.04	ODM Window	B	H				
INCC101-C.01	NSM	C	H	11/18/97			1210
INCC101-C.02	NPG/NFW/SCD	C	H	11/17/97			
INCC101-C.03	SPSR	C	H	11/17/97	11/19/97	P	1169, 1170, 1171
INCC101-C.04	CCS	C	H	11/17/97	11/17/97	P	
INCC101-C.11	Workstation DTT6	C	H	11/17/97	11/26/97	P	
INCC101-C.12	Workstation DTT7	C	H	11/17/97	11/18/97	P	1141, 1142
INCC101-C.16	CCS Operator Accounts	C	H	11/17/97	11/18/97	P	

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC101-C.17	SPSR Operator Accounts	C	H	11/17/97	11/17/97	P	
INCC101-C.18	Mixed Operator Accounts	C	H	11/18/97	11/18/97	P	
INCC101-C.23	Workstation DTT0	C	H	11/17/97	11/18/97	P	
INCC102-C.02	SPSR Server Processes Stopped During Receipt of SPSR Messages	C	H				
INCC102-C.04	SPSR Connection Broken During Receipt of SPSR Messages	C	H	12/11/97	12/23/97	F	1304
INCC102-C.08	SPSR Server Processes Stopped During Transmission of SPSR Messages	C	H	12/10/97	12/23/97	P	
INCC102-C.09	SPSR Connection Broken During Full Data Exchange	C	H	12/9/97	12/23/97	P	
INCC102-C.10	CCS Termination During Full Data Exchange	C	H	12/29/97	12/29/97	P	
INCC102-C.11	CCS Removal from Configuration During Full Data Exchange	C	H				
INCC102-C.13	Workstation Connection Broken During Alert Generation	C	H	1/2/98			
INCC102-C.14	SPSR Connection Broken During CCS Alert Generation	C	H	12/16/97	12/23/97	P	
INCC102-C.17	SPSR Connection Broken During Transmission of SPSR Messages	C	H	12/17/97	12/23/97	F	1368, 1369, 1372, 1428
INCC102-C.18	SPSR Server Processes Stopped During Event Deletion	C	H				
INCC102-C.19	CCS Cold Start During Event Processing	C	H	11/24/97	11/26/97	P	1257, 1258
INCC102-C.22	NPG Queuing Capabilities	C	H				
INCC102-C.23	Active STRS Deletion	C	H				
INCC102-C.26	CCS Removal from Configuration During Transmission of CCS Messages	C	H				
INCC103-C.02	Specify NCCDS System Configuration at Startup	C	H	1/7/98			1496
INCC103-C.11	Console Operator ID List	C	H	12/18/97	12/18/97	F	1339
INCC103-C.14	NPG Transport End Point List	C	H				
INCC103-C.15	NSM SNMP Client Component Interface with Server Component	C	H	1/19/98	1/22/98	P	
INCC103-C.16	NSM-CCS Interface	C	H	12/15/97	12/18/97	F	
INCC103-C.17	NSM-SPSR Interface	C	H	12/11/97	12/23/97	P	

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC103-C.18	NSM-Workstation Interface	C	H	12/10/97	12/10/97	P	
INCC103-C.19	NSM-NPG Interface	C	H	12/11/97	12/11/97	P	
INCC103-C.20	NSM-Monitor SPSR Processes	C	H	12/23/97	12/23/97	P	
INCC103-C.21	NSM-Monitor Workstation Processes	C	H	12/22/97	12/22/97	P	
INCC103-C.22	NSM-Monitor NPG Processes	C	H	12/15/97	12/15/97	F	
INCC103-C.23	NSM-DNS to IP Address Translation	C	H	12/29/97	12/30/97	P	
INCC103-C.24	NSM-Message Processing	C	H	12/8/97	12/9/97	P	1261, 1275
INCC105-C.01	Simultaneous Data Base Updates	C	H	12/24/97	12/24/97	P	1373
INCC105-C.03	Data Base List Updates - Inhibit/Enable Transmission Destinations Window	C	H	12/22/97	12/22/97	P	1356
INCC107-C.05	CCS/SPSR Logging	C	H	1/19/98	1/21/98	P	1613, 1614
INCC107-C.06	Cleanup of Logged Messages	C	H				
INCC107-C.13	Data Base Backups & Recoveries	C	H	11/19/97			
INCC107-C.14	SPSR/CCS-UTC Interface	C	H	12/1/97			
INCC107-C.24	Information Alert Filtering: CCS & SPSR Alerts	C	H				
INCC107-C.30	Action Alert Filtering: CCS & SPSR Alerts	C	H				
INCC109-C.14	CCS User IDs and Passwords Window	C	H	12/15/97	12/15/97	P	1305
INCC110-C.07	Valid SARs/SRMs 99/10, 99/02 - TCP Customer	C	H	11/26/97	12/2/97	P	
INCC110-C.19	Valid Delete Requests 99/11, 99/01 - TCP Baseline Customer	C	H	12/15/97	12/30/97	P	1365, 1366, 1374, 1387, 1389, 1396
INCC110-C.21	Receive SHO Status Messages 03/51	C	H	1/12/98	1/14/98	P	1509, 1512
INCC112-C.04	Transmit Normal Fixed USMs 94/01 - TCP Customer	C	H	12/31/97	1/2/98	P	
INCC112-C.05	Transmit Premium Fixed USMs 94/02 - 4800bb Customer	C	H	1/5/98	1/6/98	P	
INCC112-C.06	Transmit Simulation Fixed USMs 94/03 - TCP Customer	C	H	1/20/98			
INCC112-C.09	Schedule Transmission Rule Sets	C	H	12/17/97			
INCC112-C.13	Remote Human Readable Access	C	H				
INCC112-C.14	Transmit Normal SHO to GT 02/01	C	H	1/10/98	1/10/98	P	
INCC112-C.15	Transmit EET SHO to GT 02/03	C	H	1/15/98			1539, 1541, 1631
INCC112-C.16	Transmit IFL SHO to GT 02/06	C	H	1/6/98	1/8/98	P	1497, 1498, 1499, 1500

Integration Test Items

Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC112-C.17	Transmit Periodic Normal SHO to GT 08/01	C	H	12/2/97	1/13/98	P	1471
INCC112-C.18	Transmit Periodic EET SHO to GT 08/03	C	H	1/15/98			
INCC112-C.19	Transmit Periodic IFL SHO to GT 08/06	C	H	1/13/98	1/14/98	P	1527
INCC112-C.20	Transmit NES 90/01	C	H	1/6/98	1/6/98	P	1470
INCC112-C.21	Transmit NESU 90/04	C	H	1/6/98	1/7/98	P	1470
INCC112-C.22	Transmit NESE 90/05	C	H	1/7/98	1/7/98	P	1470
INCC112-C.23	Transmit Cancel SHO Request 03/12	C	H	1/13/98	1/13/98	P	1608
INCC112-C.24	Transmit NEC 90/02	C	H	1/8/98	1/14/98	P	
INCC113-C.06	Transmit Valid Vectors (03/10) to GT	C	H	1/5/98	1/6/98	P	
INCC113-C.09	Transmit Valid Maneuver Sequences (03/15) to GT	C	H	1/6/98	1/14/98	P	
INCC113-C.12	State Vector Rejection 03/61	C	H				
INCC113-C.13	Valid Real-Time Mode Messages 03/64	C	H	1/10/98	1/10/98	P	
INCC113-C.22	Retention of Acq/Trk Data	C	H				
INCC114-C.02	CCS Startup - SIC Updates	C	H	11/18/97	11/19/97	P	1147, 1148
INCC114-C.03	CCS Startup - TDRS Assignment Updates	C	H	11/19/97	11/24/97	P	
INCC114-C.04	CCS Startup - DQM Parameter Updates	C	H	12/3/97	12/3/97	P	1294, 1295, 1296
INCC114-C.06	Automatic Updates - SIC Data	C	H	11/18/97	11/19/97	P	
INCC114-C.07	Automatic Updates - TDRS Mapping	C	H	11/19/97	11/20/97	P	
INCC114-C.08	Automatic Updates - Authorized Users	C	H	11/19/97	11/20/97	P	
INCC114-C.10	CCS Startup - Event Data Updates	C	H	11/20/97	11/25/97	P	1191
INCC114-C.11	CCS Startup - Event Deletions	C	H	12/2/97	12/16/97	P	1292, 1293
INCC114-C.13	Automatic Updates - Event Data	C	H	11/20/97	11/26/97	P	1209
INCC114-C.14	Automatic Updates - Event Deletions	C	H	11/19/97			1168
INCC114-C.15	Service Parameters Access	C	H				
INCC114-C.17	CCS Review Events & Services - Color Coding	C	H				
INCC115-C.05	Acknowledgments and Retransmissions (03/14, 03/60)	C	H	12/1/97			
INCC116-C.19	Schedule Requests Window - Filter/Sort Option	C	H				
INCC117-C.05	Valid Operator-Initiated SRR - SMAF Service (03/03)	C	H	11/25/97	11/26/97	P	
INCC117-C.06	Valid User-Initiated GCMR (98/04, 03/03) 4800bb MOC - Normal SMAR Service	C	H	1/14/98	1/14/98	P	

Integration Test Items

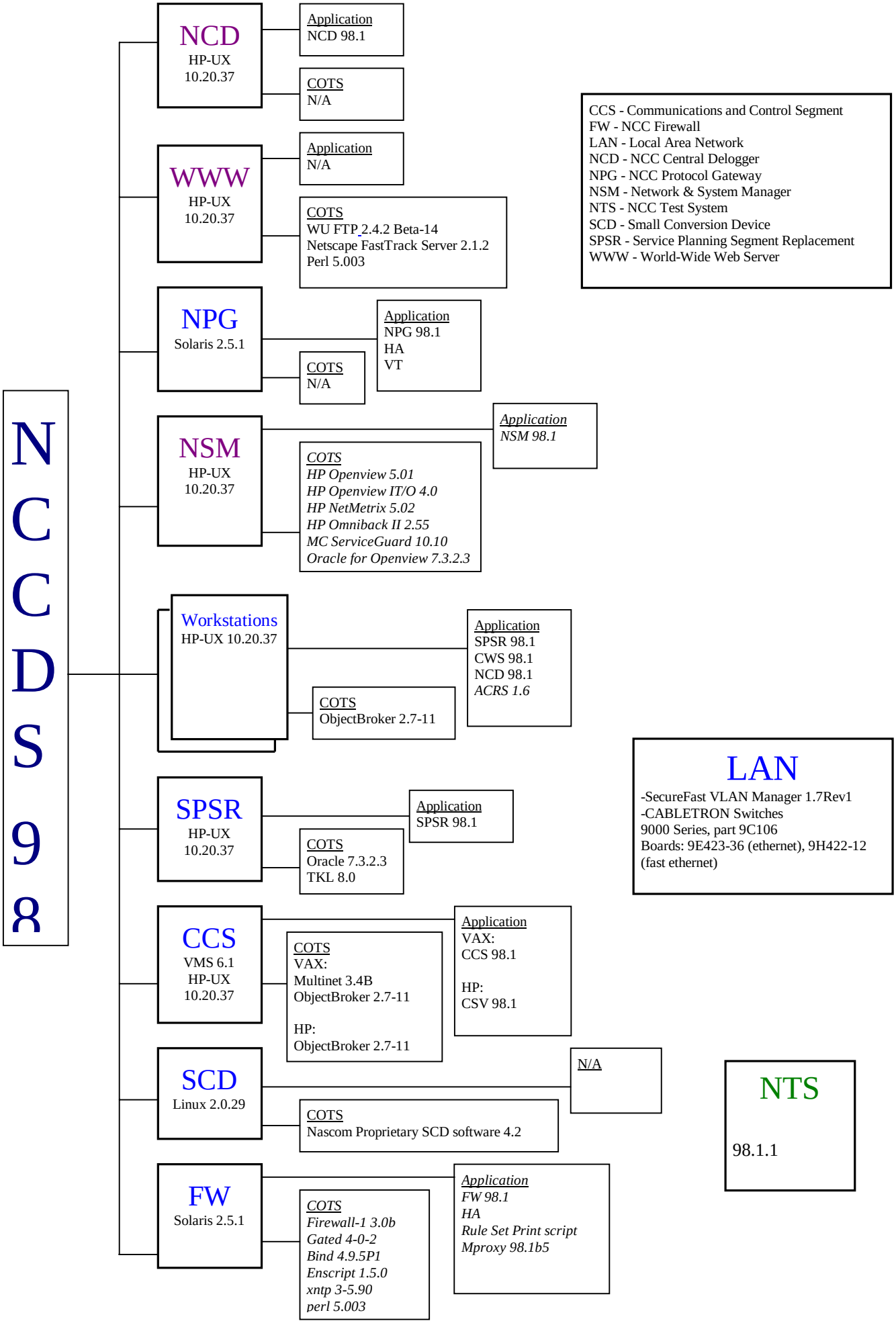
Test Item	Title	Build	Priority	Start Date	Completion Date	Status	PRs Written
INCC117-C.07	Valid User-Initiated GCMR (98/04, 03/03) TCP/IP MOC - Normal SMAR Service	C	H	1/15/98	1/15/98	P	
INCC117-C.08	Valid User-Initiated User Reacq (98/03, 03/02) 4800bb MOC - Normal SMAR Service	C	H	1/13/98	1/14/98	P	
INCC117-C.09	Valid User-Initiated Fwd Link Sweep (98/05, 03/04) TCP/IP MOC - Normal KaSAF	C	H	1/23/98			
INCC117-C.10	Valid User-Initiated Fwd Link EIRP Recon (98/06, 03/06) 4800bb MOC - Shtl KaSAF	C	H	1/21/98	1/21/98	P	
INCC117-C.11	Valid User-Init Exp User Freq Uncert Req (98/07, 03/07) TCP/IP MOC - Shtl KaSAR	C	H	1/23/98			
INCC117-C.12	Valid User-Initiated Doppler Comp Inhibit (98/08, 03/11) 4800bb MOC - SMAF	C	H	12/29/97	1/13/98	P	1381
INCC117-C.13	GCMR Acknowledgment Processing	C	H	12/18/97			1340, 1342, 1382, 1414, 1415
INCC117-C.14	NRR Messages to SDPF (90/06)	C	H				
INCC117-C.16	Valid Operator-Initiated SRR with DQM Parameters	C	H	1/5/98	1/5/98	P	
INCC117-C.18	Valid Operator-Initiated TDRS-Unique GCMR	C	H	12/22/97	12/22/97	P	1370
INCC118-C.03	Transmit UPD (91/01) to 4800bb MOC - KaSAF Service	C	H	12/4/97	12/4/97	P	
INCC118-C.04	Transmit UPD (91/01) to TCP/IP MOC - MA Service	C	H	12/16/97	1/15/98	P	
INCC118-C.05	Return Channel Time Delay msg (03/52, 92/62) TCP/IP MOC - KaSAR Service	C	H	1/23/98			
INCC118-C.06	Acquisition Failure Notification msg (03/63, 92/63) TCP/IP MOC - SMAF Service	C	H	1/15/98	1/15/98	P	
INCC118-C.07	Time-Transfer message (03/66,92/66) 4800bb MOC - SMAR Service	C	H	1/15/98	1/15/98	P	1609
INCC118-C.08	KaSAR ODMs - 05	C	H	1/10/98	1/10/98	P	
INCC118-C.09	SMAF ODMs - 06	C	H	12/30/97	12/31/97	P	
INCC118-C.10	EET ODMs - 07	C	H	1/15/98	1/15/98	P	
INCC118-C.11	TDRS Summary Menu - TDRS HIJ Assignments	C	H	11/25/97	11/25/97	P	
INCC118-C.12	TDRS Summary Display - HIJ Services	C	H	12/31/97	1/8/98	P	1420
INCC118-C.13	ODM Display - KaSAF Service	C	H	12/2/97	1/5/98	P	

Integration Test Items

INCC118-C.14	ODM Display - Link Status Checking - SMAR Service	C	H	1/6/98	1/15/98	P	1504, 1518, 1542
INCC119-C.01	Year 2000 - TDRS/SGLT Assignments	C	H	1/28/98	1/28/98	P	1580, 1581
INCC119-C.02	Year 2000 - TDRS Resource Blocking	C	H	1/28/98	1/28/98	P	
INCC119-C.03	Year 2000 - SGLT Resource Blocking	C	H	1/20/98	1/20/98	P	
INCC119-C.05	Year 2000 - Schedule Request Data Retention	C	H	1/29/98			
INCC119-C.06	Year 2000 - Event Data Retention	C	H	1/29/98			
INCC119-C.07	Year 2000 - TSW Retention	C	H	1/28/98			
INCC119-C.08	Year 2000 - Vector Data Retention	C	H	1/28/98	1/28/98	P	
INCC119-C.09	Year 2000 - Alert Processing	C	H	1/28/98	1/28/98	P	

Appendix B. Build C System Test Configuration

The following figure diagrams the system test configuration for NCC 98, Build C. The NSM was only partially tested during the System Test phase due to resource limitations, but is included in the diagram for completeness.


NCCDS 98
NCD
HP-UX
10.20.37
Application
NCD 98.1
COTS
N/A
WWW
HP-UX
10.20.37
Application
N/A
COTS
WU FTP 2.4.2 Beta-14
Netscape FastTrack Server 2.1.2
Perl 5.003
NPG
Solaris 2.5.1
Application
NPG 98.1
HA
VT
COTS
N/A
NSM
HP-UX
10.20.37
Application
NSM 98.1
COTS
HP Openview 5.01
HP Openview IT/O 4.0
HP NetMetrix 5.02
HP Omniback II 2.55
MC ServiceGuard 10.10
Oracle for Openview 7.3.2.3
Workstations
HP-UX 10.20.37
Application
SPSR 98.1
CWS 98.1
NCD 98.1
ACRS 1.6
COTS
ObjectBroker 2.7-11
SPSR
HP-UX
10.20.37
Application
SPSR 98.1
COTS
Oracle 7.3.2.3
TKL 8.0
CCS
VMS 6.1
HP-UX
10.20.37
Application
VAX:
CCS 98.1
HP:
CSV 98.1
COTS
VAX:
Multinet 3.4B
ObjectBroker 2.7-11
HP:
ObjectBroker 2.7-11
SCD
Linux 2.0.29
N/A
COTS
Nascom Proprietary SCD software 4.2
FW
Solaris 2.5.1
Application
FW 98.1
HA
Rule Set Print script
Mproxy 98.1b5
COTS
Firewall-1 3.0b
Gated 4-0-2
Bind 4.9.5P1
Enscript 1.5.0
xntp 3-5.90
perl 5.003
CCS - Communications and Control Segment
FW - NCC Firewall
LAN - Local Area Network
NCD - NCC Central Delogger
NPG - NCC Protocol Gateway
NSM - Network & System Manager
NTS - NCC Test System
SCD - Small Conversion Device
SPSR - Service Planning Segment Replacement
WWW - World-Wide Web Server
LAN
-SecureFast VLAN Manager 1.7Rev1
-CABLETRON Switches
9000 Series, part 9C106
Boards: 9E423-36 (ethernet), 9H422-12
(fast ethernet)
NTS
98.1.1

Appendix C. System Test Items

This appendix contains a listing of all the System Test items executed during NCC 98 testing.

Each test item was assigned a priority: High (H), Medium (M), or Low. The Low priority test items were not planned to be executed during System Testing, and are not listed in this appendix.

As a risk mitigation, test items related to Candidates for Deferral (as determined by a System Engineering study) were made a medium-low priority (from M01 to M12, based on the ranking in study.) Some, but not all, of the Candidates were deferred to a completion release. The test items that were deferred are not listed in this appendix; however, some test items related to the Candidates for Deferral were completed before it was decided to do a completion release, and so these items are listed here. The following table defines the prioritization of the Candidates:

Functional Capability	Test Item Priority
Keyword Service-Level Flexibility	M01
Replace Request	M02
TSWs and TDRS Flexibility	M03
Wait List	M04
TDRS HIJ Services	M05
CCS ODM GUI	M06
SLR	M07
Delta-T OPM	M08
Free-Text Messages	M09
Year 2000	No Change
Flexible Events	M10
Alternate Add Request	M11
NCD	No Change
Vector Transmission Rule Sets	M12

The status column records the final status of each test's objectives: Passed (P), Failed (F), or Waived (W). In order for System Test to be considered complete, no test item could be in the Failed state. A test item was not Passed until all PRs written against the test objectives were resolved and verified. Because all PRs were not resolved during NCC 98 testing, a test item was considered Waived if any PR remained open. The Waived status was not assigned until the open PRs were approved for conversion.

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
INCC102-C.02	SPSR Server Processes Stopped During Receipt of SPSR Messages	H	5/14/98	5/15/98	P	
INCC102-C.11	CCS Removal from Configuration During Full Data Exchange	H	7/13/98	7/16/98	P	
INCC102-C.13	Workstation Connection Broken During Alert Generation	H	1/2/98	3/3/98	P	
INCC102-C.18	SPSR Server Processes Stopped During Event Deletion	H	2/17/98	2/18/98	P	
INCC102-C.22	NPG Queuing Capabilities	H	8/1/98	8/3/98	P	
INCC102-C.23	Active STRS Deletion	H	6/26/98	7/13/98	P	
INCC102-C.26	CCS Removal from Configuration During Transmission of CCS Messages	H	7/13/98	7/31/98	P	2676
INCC119-C.01	Year 2000 - TDRS/SGLT Assignments	H	1/21/98	1/21/98	P	
INCC119-C.02	Year 2000 - TDRS Resource Blocking	H	1/21/98	1/21/98	P	
INCC119-C.03	Year 2000 - SGLT Resource Blocking	H	1/20/98	1/20/98	P	2680
INCC119-C.05	Year 2000 - Schedule Request Data Retention	H	1/29/98	8/6/98	P	
INCC119-C.06	Year 2000 - Event Data Retention	H	1/29/98	8/6/98	P	
INCC119-C.08	Year 2000 - Vector Data Retention	H	1/28/98	8/6/98	P	1647
INCC119-C.09	Year 2000 - Alert Processing	H	1/21/98	1/21/98	P	
NCC101-02	CCS Startup	M	8/27/97	8/27/97	P	1946, 1947, 2090, 2858
NCC101-03	Workstation Startup Build 1	M	8/25/97	8/25/97	P	
NCC102-01	TDRS ID	H	2/2/98	4/9/98	P	1697, 1698, 1706,
NCC102-02	TDRS Operational Names	H	11/17/97	11/19/97	P	
NCC102-03	Ground Terminal Sets	H	9/30/97	10/1/97	P	830, 1689
NCC102-04	SGLT Sets	H	10/1/97	10/13/97	P	
NCC102-05	TDRS ID/TDRS Operational Name/SGLT Mapping	H	10/13/97	10/13/97	P	901, 1868
NCC102-06	TDRS ID Resource Blocking - MAF Services	H	12/30/97	12/30/97	P	1386, 1388, 1390, 1392, 1394
NCC102-07	TDRS ID Resource Blocking - MAR Services	H	12/31/97	12/31/97	P	
NCC102-08	TDRS ID Resource Blocking - SMAF Services	M05	12/31/97	12/31/97	P	1410
NCC102-09	TDRS ID Resource Blocking - SMAR Services	M05	12/31/97	12/31/97	P	
NCC102-10	TDRS ID Resource Blocking - SSAF Services	H	12/23/97	1/7/98	P	1439, 1462
NCC102-11	TDRS ID Resource Blocking - SSAR Services	H	1/13/98	1/14/98	P	1530, 2060
NCC102-12	TDRS ID Resource Blocking - KuSAF Services	H	1/8/98	1/13/98	P	1874
NCC102-13	TDRS ID Resource Blocking - KuSAR Services	H	3/11/98	3/12/98	P	
NCC102-14	TDRS ID Resource Blocking - KaSAF Services	M05	6/12/98	6/13/98	P	
NCC102-15	TDRS ID Resource Blocking - KaSAR Services	M05	6/13/98	6/13/98	P	

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC102-16	SGLT Resource Availability - MAF/SMAF	H	2/6/98	4/9/98	P	1681, 1690
NCC102-17	SGLT Resource Availability - MAR/SMAR	H	10/7/97	6/24/98	P	930, 934
NCC102-18	SGLT Resource Availability - SSAF	H	5/7/98	5/7/98	P	2225
NCC102-19	SGLT Resource Availability - SSAR	H	10/16/97	10/16/97	P	901, 919, 920, 2225
NCC102-20	SGLT Resource Availability - KuSAF/KaSAF	H	10/15/97	10/15/97	P	901, 919, 920, 2225
NCC102-21	SGLT Resource Availability - KuSAR/KaSAR	H	10/27/97	3/27/98	P	1064
NCC102-22	SGLT Resource Availability - End-To-End Test	H	11/11/97	3/30/98	P	1064, 2053
NCC102-23	Effects Of TDRS/SGLT Mapping Updates	H	2/11/98	10/1/98	P	1812, 2610, 2618
NCC102-24	MDM And HDRM Capacities	H	11/12/97	11/13/97	P	1106, 1110
NCC102-25	General Customer Parameters - Spacecraft	H	9/25/97	4/30/98	P	773, 820, 917, 1104, 1956, 1997
NCC102-26	General Customer Parameters - Supiden	H	10/13/97	10/13/97	P	
NCC102-27	User Interface Channels	H	10/27/97	7/10/98	W	968, 2549, 2554
NCC102-28	General Customer Parameters - Schedule Distribution	H	10/14/97	10/15/97	P	
NCC102-29	Level Of Support	H	10/16/97	10/16/97	P	
NCC102-30	Service Parameter Records - Default Sets	H	1/12/98	1/14/98	W	1403, 1534, 1535, 1536, 1537, 1545, 1546, 1548, 1551, 1552, 1554, 1555
NCC102-31	Service Parameter Records - Customer Sets	H	2/12/98	3/6/98	P	1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1889, 1890, 1892, 1893, 1896, 1897, 1899
NCC102-32	SSC - MAF and SMAF Services	H	10/6/97	4/29/98	P	836, 843, 853, 860, 861, 862, 863, 864, 866, 2044, 2150, 2199
NCC102-33	SSC - Mar Services	H	3/30/98	4/28/98	P	1413
NCC102-34	SSC - Normal SMAR and SSAR Services	H	10/9/97	4/30/98	P	952, 953, 954, 955, 958, 959, 1008, 1126, 2200
NCC102-34a	SSC - Normal SMAR and SSAR Services	H	4/6/98	4/27/98	P	2152, 2388
NCC102-35	SSC - Normal SSAF Services	H	11/3/97	5/11/98	P	963, 1007, 1008, 1009, 1010, 1011, 2258
NCC102-35a	SSC - Shuttle SSAF Services	H	10/23/97	5/18/98	P	864, 866, 952, 959, 960, 961, 962, 963, 2286
NCC102-36	SSC - Normal KuSAF and KaSAF Services	H	12/2/97	5/22/98	P	1233, 1245, 2305, 2306
NCC102-36a	SSC - Shuttle KuSAF Services	H	11/4/97	5/20/98	P	1013, 1228, 1230, 1233, 1245, 2305, 2306

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC102-37	SSC - Normal KuSAR and KaSAR Services	H	2/12/98	7/30/98	P	2208
NCC102-37a	SSC - Shuttle KuSAR and KaSAR Services	H	12/4/97	12/17/97	W	1228, 1245, 1385, 1395, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1411, 1417, 1418, 1419, 2392, 2476, 2973
NCC102-38	SSC -EET Services	H	6/4/98	6/12/98	W	2409, 2380, 2381, 2409, 2430, 2432, 2436, 2448, 2449, 2488
NCC102-40	SSC - Tracking Services	H	4/9/98	4/14/98	P	
NCC102-42	SSC - Playback Services	H	7/1/98	7/6/98	W	1891, 1895, 2520, 2521, 2522
NCC102-43	Data Quality Monitoring Setup Parameters	H	11/5/97	5/27/98	P	1035, 1052, 1058, 1083, 1125, 1136, 2329
NCC102-44	Nascom Parameters	H	12/1/97	8/10/98	P	
NCC102-45	Prototype Events	H	11/3/97	12/4/97	P	
NCC102-46	Password Management	H	12/15/97	12/22/97	P	1317, 1347, 1348
NCC102-47	Scheduling Priorities	H	12/4/97	9/30/98	W	1505, 1803, 2158, 2160, 2202, 2885
NCC102-48	TDRS Sets	M03	9/25/97	9/30/97	P	803
NCC102-49	Batch and Automatic Scheduling Boundaries	H	10/6/97	6/5/98	P	869, 876, 878, 881, 888, 2321, 2382, 2383
NCC102-50	Establishing Automatic Alert Periods	H	10/6/97	5/7/98	P	874, 929
NCC102-51	Retention of Time-Dependent Data -- Window	M	3/13/98	3/16/98	P	
NCC102-52	Retention of Time-Dependent Data -- Functionality	H	4/14/98	7/9/98	P	
NCC102-54	SA Antenna Slew Time	H	10/6/97	10/6/97	P	
NCC102-55	Effects of Scheduling an Event then Modifying the Customer Database	M	6/29/98	7/23/98	P	2504
NCC102-56	Adding the Maximum Number of SICs to the Database	H	12/15/97	3/11/98	P	1783
NCC102-57	Database Reports	H	4/29/98	8/17/98	P	2133
NCC103-01	Identification of Customer Requests/Event	H	10/7/97	4/30/98	P	854, 886, 1218, 1219, 1220, 1755, 1823, 2603
NCC103-02	Authorized User/Supiden Validation- Automatic	H	10/23/97	5/11/98	P	1046, 1051
NCC103-02a	Client Identification Validation- Automatic Scheduling	H	7/10/98	7/22/98	P	1904
NCC103-03	Authorized User/Supiden Validation- Batch	H	11/3/97	5/11/98	P	
NCC103-03a	Client Identification Validation- Batch Scheduling	H	1/14/98	7/15/98	P	2201

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC103-04	Invalid SARs - Automatic Scheduling	H	10/13/97	11/24/97	P	1115, 1116, 1117, 1119
NCC103-05	Invalid SARs - Batch Scheduling	H	11/12/97	11/25/97	P	1194
NCC103-06	Valid SARs - Automatic Scheduling	H	9/25/97	8/28/98	P	810, 824, 825, 826, 1941, 1991, 2143, 2524
NCC103-07	Valid SARs - Batch Scheduling	H	2/3/98	8/20/98	P	1746, 2067, 2076, 2132, 2145, 2177, 2182, 2187, 2207, 2208, 2209, 2210, 2219
NCC103-08	Operator Requests - SARs - Automatic Scheduling	H	11/26/97	8/9/98	P	1195
NCC103-12	Invalid Alternate SARs - Automatic Scheduling	M11	10/9/97	2/17/98	P	
NCC103-24	Invalid Replace Requests - Automatic Scheduling	M02	10/1/97	11/12/97	P	
NCC103-25	Invalid Operator Requests - Replace Requests -Automatic Scheduling	M02	12/4/97	6/1/98	P	1248, 1330, 2472, 2506
NCC103-26	Build 2 Invalid Replace Requests - Automatic Scheduling	M02	5/27/98	6/1/98	P	2399, 2400, 2401
NCC103-27	Invalid Replace Requests - Batch Scheduling	M02	11/24/97	11/26/97	P	
NCC103-28	Invalid Operator Requests - Replace Requests - Batch Scheduling	M02	7/27/98	7/27/98	P	
NCC103-29	Build 2 Invalid Replace Requests - Batch Scheduling	M02	6/9/98	6/24/98	P	2457, 2461, 2462
NCC103-30	Valid Replace Requests - Automatic Scheduling	M02	11/26/97	4/30/98	P	
NCC103-31	Valid Operator Requests - Replace Requests - Automatic Scheduling	M02	12/10/97	12/22/97	P	1325
NCC103-32	Build 2 Valid Replace Requests - Automatic Scheduling	M02	7/27/98	7/30/98	P	2619
NCC103-33	Valid Replace Requests - Batch Scheduling	M02	12/23/97	12/23/97	P	
NCC103-34	Valid Operator Requests - Replace Requests - Batch Scheduling	M02	1/5/98	1/6/98	P	
NCC103-35	Build 2 Valid Replace Requests - Batch Scheduling	M02	8/7/98	8/17/98	P	2459
NCC103-44	Delete Request Validation	H	2/3/98	5/7/98	P	1668, 1762, 2231
NCC103-45	Operator Requests - Delete Request Validation	H	2/11/98	2/11/98	P	1931, 2078
NCC103-46	Valid Delete Request Processing	H	4/13/98	8/20/98	P	
NCC103-47	Operator Requests - Delete Request Processing	H	2/23/98	2/27/98	P	1841, 1842, 1843, 1845, 1870, 1872
NCC103-50	User Schedule Messages - Premium Support	H	2/9/98	11/13/98	P	1809, 2243, 2244, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2421, 2422, 2749, 2784, 2930, 3006

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC103-51	Fixed USMs - Simulation Support	H	7/24/98	9/9/98	P	
NCC103-53	Fixed USMs - Normal Support	H	7/24/98	11/13/98	P	
NCC103-55	Periodic IFL SHOs	H	4/3/98	10/16/98	P	2101, 2169, 2170, 2171, 2172, 2175, 2623, 2853
NCC103-56	Routine IFL SHOs	H	4/22/98	10/16/98	P	2169, 2170, 2171, 2172, 2175, 2853
NCC103-57	Periodic EET SHOs	H	3/19/98	10/2/98	P	2094, 2189,2190,2191, 2192, 2193, 2194, 2195, 2309, 2310, 2529, 2748, 2764, 2765
NCC103-58	Routine EET SHOs	H	7/24/98	10/2/98	P	
NCC103-59	Periodic Normal SHOs	H	4/7/98	11/13/98	P	2290, 2421, 2579, 2748, 2906, 2907, 2922, 2925, 2926, 3014
NCC103-60	Routine Normal SHOs	H	8/1/98	11/13/98	P	
NCC103-61	Normal Nascom Event Schedule	H	3/5/98	8/7/98	P	1926, 1927, 1928
NCC103-62	Emergency Nascom Event Schedule	H	7/29/98	8/10/98	P	
NCC103-63	Update Nascom Event Schedule	H	8/1/98	8/11/98	P	
NCC103-68	Operator Control of TSWs	M03	10/13/97	10/14/97	P	897, 898, 899, 977
NCC103-73	Schedule Messages for Events that Use the MDM	H	5/5/98	8/10/98	P	2428
NCC103-74	Schedule Messages for Events that Use the HDRM	H	5/29/98	8/8/98	P	2390
NCC103-75	Schedule Messages for Events that Use Video	H	3/2/98	5/15/98	P	
NCC103-76	Schedule Messages for Events that Use Analog	H	5/20/98	5/21/98	P	
NCC103-77	Schedule Messages for Events that Use the Recorder	H	7/28/98	7/30/98	W	2643
NCC103-78	Schedule Messages for Events that Use the Local Interface	H	5/11/98	7/15/98	P	2282, 2283, 2285, 2287
NCC103-79	Schedule Messages for Events that Use the EDOS Ports	H	7/22/98	9/16/98	P	2614, 2615
NCC103-80	Schedule Result Request Validation	H	7/30/98	8/7/98	P	2712
NCC104-05	TDRS Antenna Availability - Automatic Scheduling	H	2/23/98	3/30/98	P	1384, 1830
NCC104-05a	TDRS Schedulable Characteristic Availability - Automatic Scheduling	H	2/25/98	3/17/98	P	1969
NCC104-06	TDRS Antenna Availability - Batch Processing	H	5/7/98	5/14/98	P	
NCC104-06a	TDRS Schedulable Characteristic Availability - Batch Scheduling	H	5/14/98	6/2/98	P	2324
NCC104-07	SGLT Antenna Availability - Automatic Processing	H	3/2/98	4/7/98	P	
NCC104-08	SGLT Antenna Availability - Batch Processing	H	12/18/97	3/20/98	P	1519, 1521, 1953, 2008, 2009
NCC104-09	SA Ground Rules - Automatic Scheduling	H	2/4/98	5/18/98	P	1949, 1950, 2012, 2013

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC104-10	SA Ground Rules - Batch Scheduling	H	5/19/98	8/5/98	P	2319, 2323, 2328, 2756
NCC104-11	MA Ground Rules - Automatic Scheduling	H	12/15/97	3/16/98	P	1479, 1700
NCC104-12	MA Ground Rules - Batch Processing	H	2/3/98	3/27/98	P	1976, 1977, 1990
NCC104-13	SMA Ground Rules - Automatic Scheduling	M05	6/9/98	6/12/98	P	1761
NCC104-14	SMA Ground Rules - Batch Processing	M05	6/15/98	6/17/98	P	
NCC104-15	Coherent Pairs - Automatic Scheduling	H	5/14/98	10/8/98	P	2043, 2471, 2611
NCC104-16	Coherent Pairs - Batch Scheduling	H	3/23/98	4/3/98	P	2043
NCC104-17	Maximum Composite Data Rate Rules - Return Services	H	5/12/98	5/14/98	P	1702
NCC104-18	Maximum Composite Data Rate Rules - Forward Services	H	2/10/98	4/22/98	P	1722, 2131
NCC104-19	Tracking Ground Rules - Automatic Scheduling	H	2/4/98	5/29/98	P	1669, 1670, 1677, 1709, 1717, 1718, 1720, 1721
NCC104-20	Tracking Ground Rules - Batch Processing	H	2/11/98	6/4/98	P	1677, 1718, 1745, 1773, 1776
NCC104-21	EET Ground Rules - Normal - Automatic Scheduling	H	4/9/98	10/30/98	P	2111, 2134, 2136, 2139, 2146, 2147, 2148, 2149, 2257, 2747, 2772, 2776
NCC104-22	EET Ground Rules -Normal - Batch Processing	H	4/27/98	10/30/98	P	2139, 2146, 2203, 2221, 2776
NCC104-23	EET Ground Rules - Shuttle - Automatic Scheduling	H	7/29/98	10/30/98	P	2733, 2776
NCC104-24	EET Ground Rules - Shuttle - Batch Scheduling	H	7/29/98	10/30/98	P	
NCC104-25	Tape Playback Services - Automatic Scheduling	H	10/1/97	9/30/98	P	1891, 1895, 2073
NCC104-26	Tape Playback Services - Batch Processing	H	7/31/98	9/28/98	P	2861
NCC104-27	MDM Duty Factors - Automatic Scheduling	H	5/27/98	6/1/98	P	2006
NCC104-28	MDM Duty Factors - Batch Processing	H	12/17/97	8/26/98	P	2005, 2055, 2317
NCC104-29	HDRM Duty Factors - Automatic Scheduling	H	1/13/98	2/9/98	P	1307, 1683
NCC104-30	HDRM Duty Factors - Batch Processing	H	2/11/98	2/24/98	P	
NCC104-31	Data Sources And Destinations - Automatic Scheduling	H	4/14/98	6/5/98	P	1380,1412,1686, 2221
NCC104-32	Data Sources And Destinations - Batch Processing	H	6/3/98	7/2/98	P	2469
NCC104-35	Flexibility Parameter Rules - Event Tolerances - Automatic Scheduling	H	4/3/98	11/6/98	P	1983, 2069, 2070, 2075, 2081, 2518, 2917, 2977, 2997
NCC104-36	Flexibility Parameter Rules - Event Tolerances - Batch Scheduling	H	7/26/98	8/25/98	P	
NCC104-37	Active Period Events	H	3/11/98	8/18/98	P	1959, 1960, 1982, 1988, 2001, 2002, 2072, 2412
NCC104-38	Invalid Requests - Automatic Scheduling	H	11/19/97	6/5/98	P	1143, 1164, 1167

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC104-39	Invalid Requests - Batch Processing	H	12/15/97	6/24/98	P	1320, 1326, 1327, 1432, 1434, 1435, 1436, 1437, 2477
NCC104-40	Minimum Gap Parameters - Automatic Scheduling	H	5/11/98	6/12/98	P	
NCC104-41	Minimum Gap Parameters - Batch Processing	H	6/12/98	7/30/98	P	
NCC105-01	Automatic Scheduling Lockout	H	9/25/97	8/8/98	P	816, 1524, 2121
NCC105-02	Batch Scheduling Data Selection	H	12/10/97	5/13/98	P	1300, 1302, 1779, 1796, 1797, 1967
NCC105-03	Initiate Batch Scheduling Process	H	2/3/98	3/23/98	P	1970
NCC105-06	Batch Scheduling Modification	H	2/24/98	3/6/98	P	1774
NCC105-07	Select Schedule for Activation	H	5/21/98	6/11/98	P	1236, 2203
NCC105-08	Resources Allocated at Schedule Activation	H	6/2/98	6/3/98	P	
NCC105-09	Completeness and Notification of Incomplete Schedule	H	4/27/98	5/1/98	W	1951, 2163
NCC105-10	Conflicts	H	6/24/98	7/31/98	P	2059, 2505
NCC105-12	TDRS Mapping Updates	H	1/12/98	7/17/98	P	2557
NCC105-17	Schedule SAR - Automatic Schedule Update	H	3/12/98	3/17/98	P	
NCC105-18	Reset Boundary Between Batch and Automatic Update Subphases	H	6/15/98	8/17/98	P	2482
NCC105-19	Replace Request	M02	7/24/98	7/30/98	P	2627
NCC105-20	Delete Request	H	6/24/98	9/15/98	W	1808, 2512, 2513
NCC105-23	Additional Operator Capabilities	H	4/1/98	4/6/98	W	2051, 2062, 2063, 2071
NCC105-24	Management of Edited Schedule Requests	H	3/19/98	4/8/98	P	
NCC105-25	Requests Referencing Edited Requests	H	7/20/98	8/21/98	P	2602
NCC105-26	Editing the Content of Any Schedule Request	H	10/30/97	3/17/98	P	1821, 1858, 1859, 1878, 1900, 1965
NCC105-26a	Editing Content of Schedule Requests--ASAR,RR,WaitList	M02	7/27/98	7/29/98	P	
NCC105-28	Schedule Messages for Reprocessed Events	H	6/18/98	9/24/98	P	
NCC106-01	Initial Activation Mode Transmission - Forecast	H	3/10/98	9/18/98	P	1908, 1986, 2227, 2228, 2577
NCC106-02	Initial Activation Mode Transmission - Active	H	3/4/98	9/28/98	P	1940, 1941, 1942, 1944, 1945, 2577
NCC106-03	Manual Mode Transmission To MOCs	H	2/2/98	2/23/98	P	1804, 1873
NCC106-04	Manual Mode Transmission To SDPF	H	2/23/98	2/26/98	P	1820
NCC106-05	Manual Mode Transmission To GTs	H	4/3/98	5/4/98	P	
NCC106-06	Create New STRS	H	6/26/98	7/10/98	P	2018, 2135

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC106-07	Manipulate Existing STRSs	M	6/8/98	7/10/98	P	2391
NCC106-08	Semiautoma0tic Mode Transmission Execution	H	4/7/98	10/7/98	P	2127, 2128, 2180, 2204, 2205, 2350, 2866, 2916, 2929
NCC106-09	Semi-Automatic Mode Transmission -Operator Options	H	6/18/98	8/10/98	P	2096, 2097
NCC106-10	Automatic Mode Transmission	H	4/30/98	8/17/98	P	2223, 2224, 2242, 2277, 2278
NCC106-13	Time Limit	H	6/1/98	8/17/98	P	2458
NCC106-14	Transmission Segmentation	M	6/30/98	7/17/98	P	2501, 2571
NCC106-15	Schedule Status Messages	M	7/11/98	7/24/98	P	2566, 2567, 2568, 2604, 2605, 2606
NCC106-17	Manual Transmission Control	H	6/15/98	6/25/98	W	2373
NCC106-18	Transmission Inhibits	H	8/5/98	9/11/98	P	2415
NCC106-19	Free Text Messages And Printouts	H	7/1/98	7/8/98	P	
NCC106-20	Schedule Result Request Routing	H	7/1/98	7/8/98	P	2560
NCC107-01	TDRS Scheduling Windows	M03	10/15/97	10/15/97	P	
NCC107-02	Space Network (SN) Resources	M	10/15/97	10/16/97	P	
NCC107-13	CCS Retrieval of Scheduling Updates	H	7/29/98	7/30/98	P	2657
NCC107-16	CCS Retrieval of Event Deletion Updates	H	2/13/98	8/26/98	P	1763
NCC109-01	Baseline Customers - Delete	H	9/25/97	9/30/97	P	
NCC109-02	Baseline Customers - Non-Applicable Schedule Requests	H	10/27/97	11/11/97	P	
NCC109-03	Baseline Customers - Non-Applicable Schedule Messages	H	10/27/97	4/21/98	P	974
NCC109-04	Baseline Customers- Unsupported Scheduling Features	H	3/26/98	4/29/98	P	2049
NCC109-05	Minimum Impact Customers- Delete	H	11/13/97	1/15/98	P	1563
NCC109-08	Minimum Impact Customers- New Scheduling Features	H	3/16/98	3/19/98	P	
NCC110-01	Receipt of Valid IIRV Messages	H	11/26/97	1/7/98	P	1488
NCC110-02	Vector Storage	H	2/10/98	2/17/98	P	1478, 2437, 2992
NCC110-03	Entry, Editing, Copying and Deleting Vectors	H	3/12/98	3/16/98	P	1925
NCC110-04	Manual Transmission	H	11/12/97	8/13/98	P	1664, 1665
NCC110-05	Semiautomatic Transmission with Final Review Option Selected	M12	7/14/98	9/15/98	P	2575
NCC110-06	Normal Throughput Mode Transmission with Final Review Option Selected	M12	7/21/98	9/15/98	P	2612
NCC110-10	Real-Time Mode Messages	M	3/11/98	3/12/98	P	
NCC110-12	Interaction of Real-Time Throughput Mode Transmissions	M12	7/27/98	10/8/98	P	2746

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC110-13	Interaction of Normal Throughput Mode Transmissions	M12	8/12/98	8/24/98	P	
NCC110-14	Interaction of Manual Mode Transmissions	H	3/30/98	7/14/98	P	2226
NCC110-15	Interaction of Semiautomatic Mode Transmissions	M12	6/19/98	6/30/98	P	
NCC110-16	Separation of Acquisition Data	H	4/6/98	6/12/98	P	2087
NCC110-17	Semiautomatic Mode Transmission Rule Sets	M12	6/15/98	8/18/98	P	2446
NCC110-18	Retention of Vectors	H	4/15/98	4/20/98	P	2103
NCC110-19	Control Parameters	H	4/2/98	4/3/98	P	
NCC110-20	Vector Data Audits	H	2/18/98	8/12/98	W	1793, 2688
NCC110-23	Receipt of Invalid IIRV Messages	H	2/17/98	2/21/98	P	
NCC110-24	Receipt of Valid Maneuver Sequences	H	5/22/98	8/7/98	P	2370
NCC110-25	Receipt of Invalid Maneuver Sequences	H	2/23/98	3/5/98	P	1785
NCC110-26	Semiautomatic Transmission without Final Review Option Selected	M12	7/30/98	8/10/98	P	
NCC110-27	Normal Throughput Mode Transmission without Final Review Option Selected	M12	8/4/98	8/13/98	P	
NCC110-28	Real-Time Throughput Mode Transmission	M12	7/31/98	8/5/98	P	
NCC110-29	Manual Transmission Termination	H	3/5/98	3/10/98	P	
NCC110-30	Manual Transmission Inhibits	H	11/10/97	1/6/98	P	
NCC110-31	Epoch Time Changes	H	5/7/98	11/5/98	P	1645, 2259
NCC110-33	Real-Time Throughput Transmission Inhibits	M12	7/31/98	8/3/98	P	2644
NCC110-34	Normal Throughput Transmission Inhibits	M12	8/3/98	8/9/98	P	2681
NCC110-35	Semi-automatic Throughput Transmission Inhibits	M12	7/28/98	8/6/98	P	
NCC111-01	TDRS -Unique GCMRs of MAF Service from MOC	M	9/16/97	9/19/97	P	729, 730
NCC111-02	User Reconfiguration GCMRs of MAF Service from MOC	M	5/19/98	6/1/98	P	
NCC111-03	TDRS-Unique GCMRs of MAF Service from Operator	M	9/16/97	9/16/97	P	
NCC111-04	User Reconfiguration GCMRs of MAF Service from Operator	H	2/10/98	2/11/98	P	
NCC111-05	TDRS -Unique GCMRs of MAR Service from MOC	H	3/6/98	3/11/98	P	
NCC111-06	User Reconfiguration GCMRs of MAR Service from MOC	H	2/10/98	8/6/98	P	1748, 1888
NCC111-07	TDRS-Unique GCMRs of MAR Service from Operator	M	9/16/97	9/19/97	P	
NCC111-10	User Reconfiguration GCMRs of Non-Shuttle SSAR Service from MOC	H	2/23/98	5/6/98	P	1814
NCC111-11	TDRS-Unique GCMRs of Non-Shuttle SSAF Service from Operator	H	2/24/98	3/3/98	P	

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC111-12	User Reconfiguration GCMRs of Non-Shuttle SSAF Service from Operator	M	9/4/97	9/15/97	P	
NCC111-13	TDRS -Unique GCMRs of Non-Shuttle SSAR Service from MOC	H	2/24/98	3/4/98	P	
NCC111-14	User Reconfiguration GCMRs of Non-Shuttle SSAR Service from MOC	M	7/20/98	8/5/98	P	683, 691
NCC111-15	TDRS-Unique GCMRs of Non-Shuttle SSAR Service from Operator	M	8/25/97	6/26/98	P	
NCC111-16	User Reconfiguration GCMRs of Non-Shuttle SSAR Service from Operator	H	3/19/98	5/19/98	P	2031, 2289, 2508
NCC111-17	TDRS -Unique GCMRs of Non-Shuttle KuSAF Service from MOC	H	4/22/98	5/5/98	P	
NCC111-18	User Reconfiguration GCMRs of Non-Shuttle KuSAF Service from MOC	H	2/23/98	3/4/98	P	1834
NCC111-19	TDRS-Unique GCMRs of Non-Shuttle KuSAF Service from Operator	H	4/15/98	5/1/98	P	
NCC111-20	User Reconfiguration GCMRs of Non-Shuttle KuSAF Service from Operator	H	3/5/98	3/5/98	P	
NCC111-21	TDRS -Unique GCMRs of Non-Shuttle KuSAR Service from MOC	M	9/2/97	9/15/97	P	667
NCC111-23	TDRS-Unique GCMRs of Non-Shuttle KuSAR Service from Operator	M	9/2/97	9/5/97	P	
NCC111-24	User Reconfiguration GCMRs of Non-Shuttle KuSAR Service from Operator	H	5/14/98	6/17/98	P	
NCC111-25	TDRS -Unique GCMRs of Shuttle SSAF Service from MOC	H	2/26/98	3/4/98	P	
NCC111-26	User Reconfiguration GCMRs of -Shuttle SSAF Service from MOC	M	3/5/98	3/10/98	P	1875, 1902
NCC111-28	User Reconfiguration GCMRs of -Shuttle SSAF Service from Operator	M	7/7/98	7/10/98	P	
NCC111-29	TDRS -Unique GCMRs of Shuttle SSAR Service from MOC	M	3/12/98	4/22/98	P	
NCC111-30	User Reconfiguration GCMRs of Shuttle SSAR Service from MOC	M	3/12/98	4/28/98	P	
NCC111-31	TDRS-Unique GCMRs of Shuttle SSAR Service from Operator	H	4/2/98	4/6/98	P	

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC111-32	User Reconfiguration GCMRs of Shuttle SSAR Service from Operator	H	3/10/98	3/11/98	P	
NCC111-33	TDRS -Unique GCMRs of Shuttle KuSAF Service from MOC	H	4/28/98	5/4/98	P	
NCC111-34	User Reconfiguration GCMRs of Shuttle KuSAF Service from MOC	M	7/10/98	7/29/98	P	
NCC111-35	TDRS-Unique GCMRs of Shuttle KuSAF Service from Operator	M	6/19/98	7/21/98	P	
NCC111-36	User Reconfiguration GCMRs of Shuttle KuSAF Service from Operator	M	9/5/97	9/8/97	P	685
NCC111-37	TDRS -Unique GCMRs of Shuttle KuSAR Service from MOC	M	9/5/97	9/15/97	P	
NCC111-38	User Reconfiguration GCMRs of Shuttle KuSAR Service from MOC	H	5/4/98	5/21/98	P	2212, 2213
NCC111-39	TDRS-Unique GCMRs of Shuttle KuSAR Service from Operator	M	6/19/98	6/19/98	P	
NCC111-40	User Reconfiguration GCMRs of Shuttle KuSAR Service from Operator	H	6/3/98	7/7/98	P	
NCC111-41	TDRS -Unique GCMRs of Non-Shuttle KaSAF Service from MOC	M05	7/2/98	7/8/98	P	2526
NCC111-42	User Reconfiguration GCMRs of Non-Shuttle KaSAF Service from MOC	M05	7/8/98	7/10/98	P	
NCC111-43	TDRS-Unique GCMRs of Non-Shuttle KaSAF Service from Operator	M05	6/12/98	7/20/98	P	2484, 2498, 2584
NCC111-44	User Reconfiguration GCMRs of Non-Shuttle KaSAF Service from Operator	M05	7/21/98	9/9/98	P	2626, 2663, 2664
NCC111-45	TDRS -Unique GCMRs of Non-Shuttle KaSAR Service from MOC	M05	6/9/98	6/11/98	P	
NCC111-46	User Reconfiguration GCMRs of Non-Shuttle KaSAR Service from MOC	M05	6/12/98	6/22/98	P	
NCC111-47	TDRS-Unique GCMRs of Non-Shuttle KaSAR Service from Operator	M05	6/12/98	6/15/98	P	
NCC111-48	User Reconfiguration GCMRs of Non-Shuttle KaSAR Service from Operator	M05	6/15/98	6/24/98	P	
NCC111-49	TDRS -Unique GCMRs of SMAF Service from MOC	M05	6/3/98	6/4/98	P	2389
NCC111-50	User Reconfiguration GCMRs of SMAF Service from MOC	M05	6/15/98	8/17/98	P	2416

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC111-51	TDRS-Unique GCMRs of SMAF Service from Operator	M05	6/12/98	7/20/98	P	2586
NCC111-52	User Reconfiguration GCMRs of SMAF Service from Operator	M05	7/20/98	9/23/98	P	2750, 2752, 2753
NCC111-53	TDRS -Unique GCMRs of SMAR Service from MOC	M05	6/19/98	6/30/98	P	
NCC111-54	User Reconfiguration GCMRs of SMAR Service from MOC	M05	6/5/98	8/17/98	P	
NCC111-55	TDRS-Unique GCMRs of SMAR Service from Operator	M05	6/2/98	6/5/98	P	
NCC111-56	User Reconfiguration GCMRs of SMAR Service from Operator	M05	7/22/98	9/2/98	P	2475
NCC111-58	Reconfiguration in Progress	H	9/2/97	3/23/98	P	
NCC111-60	NCCDS Validation Rejects	H	9/8/97	4/7/98	P	689, 690, 1854
NCC111-62	Status Before Acknowledgement	H	2/9/98	2/17/98	P	
NCC111-63	OPM Status Message -- Format Validation	H	3/27/98	4/14/98	P	
NCC111-66	Cancel SHO Request and OPM Rejects	H	3/20/98	4/15/98	P	2102
NCC111-67	No NRR When No Schedule Message Sent	H	3/4/98	3/10/98	P	
NCC111-68	NRR Status Message	H	4/21/98	8/13/98	P	
NCC111-71	GCMR Validation of Customer Overrides	H	3/23/98	4/21/98	W	2113
NCC111-72	GCMR Validation of Customer Overrides (SMA & Ka)	M05	6/19/98	7/2/98	W	
NCC111-73	SHO Subheader Reconfiguration	H	2/19/98	9/23/98	P	1827, 1828, 1835,1836, 1911, 1916, 1917, 1918, 1923, 1924, 1932, 1927
NCC112-01	Valid UPD Requests From MOCs	M	8/25/97	9/11/97	P	
NCC112-02	Valid UPD Requests From The Operator	H	3/10/98	3/13/98	P	1903, 1914
NCC112-03	Invalid UPD Requests From MOCs	M	9/9/97	9/9/97	P	
NCC112-04	Invalid UPD Requests From The Operator	M	9/4/97	3/11/98	P	674
NCC112-07	Invalid SA ODMs	H	2/18/98	2/24/98	P	
NCC112-08	Invalid SA ODMs - TDRS H, I, & J	M05	7/31/98	7/31/98	W	
NCC112-10	Invalid SMAR ODMs	M05	6/12/98	7/31/98	W	2427
NCC112-12	Invalid MA ODMs	M	8/26/97	6/24/98	P	669, 670, 679, 680, 681
NCC112-14	Invalid SMAF ODMs	M05	8/5/98	8/6/98	W	
NCC112-16	Invalid EET ODMs	M	9/3/97	3/19/98	P	676
NCC112-17	UPD Transmission - Normal	M	8/25/97	8/28/97	P	663
NCC112-18	UPD Transmission - Shuttle	M	9/4/97	9/5/97	P	
NCC112-19	UPD Transmission - Normal, TDRS H, I, & J	M05	7/30/98	8/7/98	P	

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC112-22	DQM Data Packaging - Normal, TDRS H, I, & J	M05	6/15/98	6/17/98	P	
NCC114-05	Maximum ODM Processing	H	3/16/98	3/19/98	P	
NCC115-01	Return Channel Time Delay Measurement	H	2/25/98	3/23/98	P	
NCC115-02	Return Channel Time Delay Measurement - TDRS H, I And J	M05	6/3/98	6/3/98	P	2410, 2411, 2374
NCC115-03	Time Transfer Messages	H	8/28/97	3/9/98	P	
NCC115-04	Time Transfer Messages	M05	7/15/98	7/27/98	P	
NCC115-05	Acquisition Failure Notification	H	5/15/98	8/5/98	P	
NCC115-06	Acquisition Failure Notification (SMA And Ka)	M05	6/16/98	8/18/98	P	2558
NCC116-01	Designate Alerts as Information or Action	H	5/22/98	6/1/98	P	
NCC116-02	Assign Alerts	H	3/12/98	3/12/98	P	1948
NCC116-03	Assign Operator Entries	H	10/9/97	3/2/98	P	932, 933
NCC117-04	Alerts	H	6/2/98	6/9/98	P	1688, 2553
NCC117-07	Log-off While Work-in-progress	M	6/18/98	6/18/98	P	2489, 2510, 2511
NCC118-01	Communications With Simulated TCP MOC and GT	H	5/19/98	8/6/98	P	2340
NCC118-02	Communications With Simulated 4800 BB Entities	H	5/6/98	7/10/98	P	2384, 2388
NCC118-03	Control of External Message Lines	H	5/11/98	6/20/98	P	2291
NCC119-01	Accounting Management	H	2/4/98	4/29/98	W	1765, 1933, 2129, 2254
NCC119-02	System Configuration Management	H	7/27/98	9/16/98	P	1933, 2129, 2235, 2254
NCC119-03	NSM Database	H	8/5/98	8/5/98	W	1933, 2129, 2254, 2479
NCC119-04	Displays	H	5/26/98	8/21/98	P	1933, 2129, 2237, 2238, 2254, 2255
NCC119-06	System Performance Management	H	6/17/98	6/17/98	W	1933, 2129, 2254, 2485, 2486
NCC119-07	General Systems Management	H	7/27/98	8/5/98	W	1933, 2129, 2254, 2728, 2822, 2823
NCC119-08	NSM Security Management	H	2/9/98	8/6/98	P	1687, 1933, 2129, 2254
NCC119-10	Data Storage and Manipulation	H	2/12/98	2/12/98	P	1749, 1750, 1933, 2129, 2254
NCC119-11	Data Integrity	H	2/11/98	7/31/98	W	1933, 2129, 2236, 2254, 2727
NCC122-01	Operator Access Control - SPSR	H	2/9/98	2/12/98	P	
NCC122-02	Operator Access Control - CCS	H	2/17/98	3/3/98	P	
NCC122-05	Operator Identification And Authentication - SPSR	H	2/12/98	2/17/98	P	
NCC122-06	Operator Identification And Authentication - CCS	H	2/17/98	2/17/98	P	
NCC122-07	Operator Identification And Authentication - NSM	H	3/19/98	3/19/98	P	
NCC122-09	System Entry - SPSR	H	3/30/98	5/11/98	P	

System Test Items

Test Item	Title	Priority	Start Date	Completion Date	Status	PRs Written
NCC122-10	System Entry - CCS	H	3/30/98	5/11/98	P	
NCC122-11	System Entry - NSM	H	3/13/98	3/13/98	P	
NCC122-12	System Entry - NPG	H	3/13/98	3/13/98	P	
NCC122-13	Operator Masquerade - SPSR	H	3/16/98	3/16/98	P	
NCC122-14	Operator Masquerade - CCS	H	3/16/98	3/16/98	P	
NCC122-15	Operator Masquerade - NPG	H	4/23/98	4/23/98	P	
NCC122-24	Database Management System Security	H	3/18/98	3/18/98	P	
NCC122-26	UDP Encapsulation/Decapsulation	H	5/11/98	7/31/98	P	
NCC123-01	External Message Logging	H	3/17/98	5/20/98	P	2261
NCC123-02	Ncc Console Operator Action Logging	H	5/26/98	6/1/98	P	2351, 2397
NCC123-05	Centralized Logging Control	M	6/22/98	6/24/98	P	
NCC133-01	Year 2000 - User Accounts	H	1/19/98	1/19/98	P	
NCC133-02	Year 2000 - SPSR Database Save	H	1/22/98	1/22/98	P	1619
NCC133-03	Year 2000 - Batch Processing	H	1/26/98	8/20/98	P	1628, 1629
NCC133-04	Year 2000 - Automatic Scheduling	H	1/19/98	8/21/98	P	1610, 1611
NCC133-05	Year 2000 - Real Time Processing	H	1/21/98	8/7/98	P	1612, 1620, 2672, 2673
NCC133-06	Year 2000 - Acq/Trk Processing	H	1/19/98	8/19/98	P	
NCC133-07	Year 2000 - Leap Year Processing	H	1/26/98	8/31/98	P	1626, 1632, 1633, 1634, 1656
NCC133-08	Year 2000 - CCS Database Save	H	1/22/98	8/21/98	P	
NCC133-09	Year 2000 - NSM Database Save	H	1/22/98	8/21/98	P	2736
NCC133-10	September 9, 1999	H	1/29/98	1/29/98	P	1638
NCC134-01	NPG Local Interfaces	M	6/24/98	6/24/98	P	
NCC137-01	TUT - SA Antenna	H	3/11/98	10/7/98	W	2631, 2633, 2634, 2911, 2912, 2913
NCC137-02	TUT - MAF/SMAF Antenna	H	7/27/98	8/12/98	P	1673, 2634, 2684
NCC137-03	TUT - MAR/SMAR Antenna	H	8/6/98	8/10/98	P	2634
NCC137-04	TUT Generation	H	7/27/98	8/1/98	P	2217, 2620, 2621
NCC137-05	Remote Human-Readable Access To TUT	H	5/8/98	8/13/98	P	1634, 1674, 2033, 2034, 2036, 2184, 2185, 2217, 2218, 2230, 2632
NCC137-06	Inhibiting TUT Generation	H	8/1/98	8/1/98	P	
NCC137-07	Simultaneous TUT Requests	H	7/29/98	8/19/98	P	2705, 2716

Appendix D. Year 2000 Daily Checklist

The following checklist documents the setup activities performed each day of Year 2000 testing.

Time (EST Local)	Segment (both test strings where applicable)	Action	Responsible Group
before 8:30 am	SPSR	Delete selected log files, including log files on workstations attached to the test string	SPSR SysAdmin
before 8:30 am	Workstations	Shutdown workstations except NSM1, tsrv0, tsrv1	SPSR SysAdmin
before 8:30 am	CCS	Purge CCS log files from previous days.	SysAdmin
before 8:30 am	CCS004 & tsrv0	NTP processes : set times to 12/31 1999 19:MM Z or as requested by Y2K test lead in table of rollback times	SPSR SysAdmin
before 8:30 am		Reload saved password file	SPSR SysAdmin
before 8:30 am		"touch" everything in /etc/hosts, /etc/passwd.nis, etc/group, and /var/yp/dtt.nasa.gov/	SPSR SysAdmin
before 8:30 am	NSM1, tsrv0, tsrv1	Reboot	SPSR SysAdmin
before 8:30 am	NPG	Restore NPG to initial state (delete log files, reset time and reboot)	SysAdmin
before 8:30 am	Workstations	Reboot all workstations when NTP is stable	SPSR SysAdmin
before 9:00 am	NTS	Set times to 12/31 1999 19:MM Z or as requested by Y2K test lead, clean out log files and renew file name table per developer's instructions	SysAdmin
before 9:00 am	SPSR	Import most recent SPSR database schemas that were saved when system had 1998 times	Y2K test lead or test personnel

Appendix E. Year 2000 Test Objectives

The following table documents the status of the Year 2000 test objectives as of the end of Phase Two testing.

Test Item	Objective	Verified	Comments
NCC133-01	Password expiration dates are correctly calculated for the year 1999 to 2000 rollover.	Yes	
NCC133-01	Operators can successfully logon in the year 2000.	Yes	
NCC133-02	The year 2000 dates are formatted correctly on SPSR.	Yes	
NCC133-02	The year 2000 SPSR database records are correctly stored, retrieved, and sorted by date before, during, and after rollover.	Yes	
NCC133-02	SPSR DB saves are successful in the year 2000.	Yes	
NCC133-02	SPSR DB recoveries are successful in the year 2000.	Yes	
NCC133-03	TSWs are stored correctly over the year 2000 rollover.	Yes	
NCC133-03	TSWs are used correctly by Schedule Requests in the year 2000	No	Deferred to a completion release.
NCC133-03	The event durations are calculated correctly over the year 2000 rollover.	Yes	
NCC133-03	SARs are correctly stored in appropriate queues over the year 2000 rollover.	Yes	
NCC133-03	Alternate SARs are stored and reference the appropriate requests correctly over the year 2000 rollover.	No	Deferred to a completion release.
NCC133-03	Replace Requests are stored and reference the appropriate requests correctly over the year 2000 rollover.	Yes	
NCC133-03	The event tolerances are calculated correctly over the year 2000 rollover.	Yes	
NCC133-03	SRMs are sent to the MOCs for declined requests in the year 2000.	Yes	

Test Item	Objective	Verified	Comments
NCC133-03	USMs are sent to the MOCs for scheduled requests in the year 2000.	Yes	
NCC133-03	A batch schedule is activated correctly over the year 2000 rollover.	Yes	
NCC133-03	A batch schedule is appended to the active schedule correctly in the year 2000 rollover.	Yes	
NCC133-03	The active period boundary is moved correctly over the year 2000 rollover.	Yes	
NCC133-04	TSWs are stored correctly over the year 2000 rollover.	Yes	
NCC133-04	TSWs are used correctly by Schedule Requests in the year 2000	No	Deferred to a completion release.
NCC133-04	The event durations are calculated correctly over the year 2000 rollover in the automatic scheduling period.	Yes	
NCC133-04	Event and service tolerances are calculated correctly over the year 2000 rollover in the automatic scheduling period.	*	Event tolerances were verified. Service tolerances were deferred to a completion release.
NCC133-04	USMs are sent to the MOCs for scheduled requests in the year 2000.	Yes	
NCC133-04	The automatic scheduling boundary is moved correctly over the year 2000 rollover.	Yes	
NCC133-04	Review CCS Events correctly displays events for an interval spanning the year 2000 rollover.	Yes	
NCC133-04	Review SPSR Events correctly displays events for an interval spanning the year 2000 rollover.	Yes	
NCC133-04	The 2000 dates are formatted correctly.	Yes	
NCC133-04	All events in the year 2000 are processed as expected.	Yes	
NCC133-04	In dates with two digit years, 00 is greater than 99.	Yes	
NCC133-04	TUT is generated and displayed correctly over the year 2000 rollover.	Yes	
NCC133-04	STRS and manual schedule transmissions function correctly over the year 2000 rollover.	Yes	

Test Item	Objective	Verified	Comments
NCC133-04	Event and Service Tolerances are used correctly over the year 2000 rollover in the automatic scheduling period.	*	Event tolerances were verified. Service tolerances were deferred to a completion release.
NCC133-04	SAR Start Time Interval is calculated correctly over the year 2000 rollover.	Yes	
NCC133-05	Event listings can be properly transferred over to CCS during Y2K.	Yes	
NCC133-05	Reconfigurations can be performed in the year 2000.	Yes	
NCC133-05	User Performance Data (UPD) can be enabled in the year 2000.	Yes	
NCC133-05	UPD messages can be transmitted to the MOCs in the year 2000.	Yes	
NCC133-05	Communication Test Messages (CTMs) can be enabled for events in the year 2000.	Yes	
NCC133-05	For events that start less than 5 minutes before the year 2000 rollover, the event start alert is received 5 minutes prior to the event start time.	Yes	
NCC133-05	For events that start less than 5 minutes before the year 2000 rollover, CTMs are sent to the MOCs at approximately the same time as the event start alert is received.	Yes	
NCC133-05	Acquisition Failure messages are sent to the MOCs in the year 2000.	Yes	
NCC133-05	Time Transfer messages are sent to the MOCs in the year 2000.	Yes	
NCC133-05	Return Time Channel Delay Measurement messages are sent to the MOCs in the year 2000.	Yes	
NCC133-06	The 2000 dates are formatted correctly for acquisition data.	Yes	
NCC133-06	Year 2000 acquisition data is correctly validated, stored, retrieved and sorted by date when applicable.	Yes	
NCC133-06	Vectors can be transmitted in Y2K	Yes	
NCC133-06	VTRS transmissions function correctly over the year 2000 rollover.	Yes	

Test Item	Objective	Verified	Comments
NCC133-06	Delta –T adjustments work as expected in Y2K.	No	Functionality was not tested in NCC 98.
NCC133-07	TDRS/SGLT assignments are able to span the last day of the year for 2000.	Yes	
NCC133-07	The epoch times for vectors are displayed correctly on day 366 for the year 2000.	Yes	
NCC133-07	Vectors are transmitted, received and stored correctly on day 366 for the year 2000.	Yes	
NCC133-07	A batch schedule can be generated and activated on day 366 for the year 2000.	Yes	
NCC133-07	Upon activation, a batch schedule is appended correctly to the active schedule for the year 2000.	Yes	
NCC133-07	Requests in a batch schedule are stored in the appropriate queues on day 366 for the year 2000.	Yes	
NCC133-07	User Schedule Messages (USMs) are sent to the MOCs for scheduled requests for day 366 of the year 2000.	Yes	
NCC133-07	Schedule Result Messages (SRMs) are sent to the MOCs for declined requests for day 366 of the year 2000.	Yes	
NCC133-07	TDRS Unscheduled Time (TUT) can be generated on day 366 for the year 2000.	Yes	
NCC133-07	Resource availability is correctly reported for the leap year TUT generation.	Yes	
NCC133-07	Schedule Add Requests (SARs) (99/10s) can be transmitted and displayed correctly for the 2000 leap year.	Yes	
NCC133-07	Reconfigurations can be performed successfully on day 366 of the year 2000.	Yes	
NCC133-07	The appropriate Operations Performance Messages (OPMs) are generated and transmitted to the correct ground terminal after a reconfiguration is received on day 366 of the year 2000.	Yes	
NCC133-07	User Performance Data messages (UPDs) (91/01s) are sent to the correct MOCs and are formatted properly on day 366 of the year 2000.	Yes	

Test Item	Objective	Verified	Comments
NCC133-07	After receiving an Acquisition Failure request (03/63), a Acquisition Failure Notification (92/63) is sent to the correct MOC on day 366 of the year 2000.	Yes	
NCC133-07	After receiving a Time Transfer request (03/66), a Time Transfer message (92/66) is sent to the correct MOC on day 366 of the year 2000.	Yes	
NCC133-07	After receiving a Return Channel Time Delay Data request (03/53), a Return Channel Time Delay Measurement message (92/62) is sent to the correct MOC on day 366 of the year 2000.	Yes	
NCC133-07	Information and action alerts are labeled correctly on day 366 for the year 2000.	Yes	
NCC133-07	A database save and recovery can be performed successfully on day 366 for the year 2000.	*	Saves and recoveries had the potential to cause system problems. Limited verification was performed.
NCC133-08	CCS saves are successful in the year 2000.	Yes	
NCC133-08	CCS recoveries are successful in the year 2000.	Yes	
NCC133-09	The year 2000 dates for NSM are formatted correctly.	Yes	
NCC133-09	The year 2000 database records for NSM are correctly stored, retrieved, and sorted by date before, during, and after rollover.	Yes	
NCC133-09	The NSM/TSRV1 interface is successfully monitored.	Yes	
NCC133-09	The NSM/workstation interface is successfully monitored.	Yes	
NCC133-09	Tsrv1 and SPSR ITO agents are properly monitored by the NSM.	Yes	
NCC133-09	The operator can highlight NSM messages.	Yes	
NCC133-09	The operator can own/disown NSM messages.	Yes	
NCC133-09	The operator can perform operator-initiated actions from the Message Details window.	Yes	
NCC133-09	The operator can escalate a message to another ITO server.	Yes	
NCC133-09	The operator can acknowledge/unacknowledge NSM messages.	Yes	

Test Item	Objective	Verified	Comments
NCC133-09	NSM DB saves are successful in the year 2000.	Yes	
NCC133-09	NSM DB recoveries are successful in the year 2000.	Yes	
INCC119-01	The NCCDS properly handles TDRS/SGLT assignments for the Year 2000 Rollover.	Yes	
INCC119-02	The NCCDS properly handles TDRS resource blocking of data base records for the Year 2000 Rollover.	Yes	
INCC119-03	The NCCDS properly handles SGLT resource blocking of data base records for the Year 2000 Rollover.	Yes	
INCC119-05	Schedule request data is purged or retained according to the retention criteria around the Year 2000 Rollover.	Yes	
INCC119-06	Events and associated schedule messages are purged or retained according to the retention criteria around the Year 2000 Rollover.	Yes	
INCC119-07	TSW data is purged or retained according to the retention criteria around the Year 2000 Rollover.	No	Deferred to a completion release.
INCC119-08	Vector data is purged or retained according to the retention criteria around the Year 2000 Rollover.	Yes	
INCC119-09	Alerts with timestamps before and after the Year 2000 Rollover are displayed and processed properly.	Yes	
INCC119-09	The Acknowledged time field is displayed properly for alerts received before and Acked before, alerts received before and Acked after, and alerts received after and Acked after the Year 2000 rollover.	Yes	

Abbreviations and Acronyms

The following is list of terms and abbreviations found in this document and in other test-related documentation and reference documents.

ACQ/TRK	acquisition/tracking
ACRS	automated conflict resolution system
AIS	automated information system
ATRR	acceptance test readiness review
ATSC	Allied Signal Technical Services Corporation
BVT	build verification test
CCB	configuration control board
CCR	configuration change request
CCS	communications and control segment
CDR	critical design review
CM	configuration management
cNMOS	consolidated Network and Mission Operations Support
COTS	commercial off the shelf
CSC	Computer Sciences Corporation
CSCI	computer software configuration item
CSS	Nascom Control and Status System
CTB	communication test block
CTM	communication test message
DB	database
DBA	database administrator
DFCD	data format control document
DG	data group
DIS	data interface system
DQM	data quality monitoring

DSID	data stream ID
DTS	daily test summary
EET	end-to-end test
EIF	engineering interface
FDF	Flight Dynamics Facility
FTP	file transfer protocol
FW	firewall
GCM	ground control message
GCMR	ground control message request
GSFC	Goddard Space Flight Center
GUI	graphical user interface
GT	ground terminal
HA	high availability
HDRM	high data rate multiplexer
I&A	identification and authentication
I&T	integration and test
I/O	input/output
ICD	interface control document
IFL	interfacility link
IIR	interface incidence report
IIRV	improved interrange vector
INPG	interim NCC protocol gateway
ITRR	integration test readiness review
JISTT	Joint Integration and System Test Team
JPIC	Joint Process Improvement Committee
JSC	Johnson Space Center
KaSA	Ka-band single access
KaSAF	Ka-band single access forward
KaSAR	Ka-band single access return
KuSA	Ku-band single access

KuSAF	Ku-band single access forward
KuSAR	Ku-band single access return
LAN	local area network
LI	local interface
MA	multiple access
MAF	multiple access forward
MAR	multiple access return
MDM	multiplexer/demultiplexer
MO&DSD	Mission Operations and Data Systems Directorate
MOC	Mission Operations Center
NASA	National Aeronautics and Space Administration
Nascom	NASA communications
NCC	Network Control Center
NCCDS	NCC Data System
NCC 98	Network Control Center Data System 1998
NCD	NCC Central Delogger
NCR	NCC change request
NSM	Network and System Manager
NES	Nascom event schedule
NFE	NCC front-end
NPG	NCC Protocol Gateway
NRR	Nascom reconfiguration request
NTS	Network Testing System
OCR	Operations Control Room
ODM	operations data message
OPM	operations message
PR	problem report
RID	review item disposition
RMA	reliability/maintainability/availability
RR	requirements review

SA	single access
SAR	schedule add request
SAS	service accounting segment
S/C	sensitivity/criticality
SCD	small conversion device
SDE	software development environment
SDF	software development facility
SDPF	Sensor Data Processing Facility
SGLT	space-to-ground link terminal
SHO	scheduled service order
SHO ID	scheduled service order identification
SIC	spacecraft identification code
SLR	service level report
SMA	enhanced multiple access
SMAF	enhanced multiple access forward
SMAR	enhanced multiple access return
SN	space network
SPSR	service planning segment replacement
SQL	structured query language
SRIS	system resources infrastructure segment
SRD	system requirements document
SRM	schedule result message
SRR	system requirements review
SSA	S-band single access
SSAF	S-band single access forward
SSAR	S-band single access return
SSC	service specification code
STDN	Spaceflight Tracking and Data Network
STGT	Second TDRSS Ground Terminal
STRR	system test readiness review

STRS	schedule transmission rule set
SUPIDEN	support identification
SWO	security watch officer
T&T	Test and Training
TBD	to be determined
TBS	to be supplied
TCP/IP	transmission control protocol/internet protocol
TDRS	tracking and data relay satellite
TDRSS	Tracking and Data Relay Satellite System
TLAS	TDRS look angle system
TNC	TDRS Network Controller
TRR	test readiness review
TRS	transmission rule set
TSW	TDRS scheduling window
TT&C	tracking, telemetry and command
TUT	TDRSS Unscheduled Time
UPD	user performance data
User ID	user identification
USM	user schedule message
UTC	coordinated universal time
VIC	vehicle identification code
VID	vehicle ID
VT	vector translator
VTRS	vector transmission rule set
WSC	White Sands Complex
WSGTU	White Sands Ground Terminal Upgrade
WWW	World Wide Web
Y2K	Year 2000