Testing and Transition: The Final Days of System Development

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ABSTRACT

As part of existing tasking, the Military Traffic Management Command (MTMC) requested that Oak Ridge National Laboratory (ORNL) assist with writing test scenarios for the formal testing of the Worldwide Port System (WPS) Regional Integrated Cargo Database (ICDB). In collaboration with MTMC, ORNL wrote almost 600 Test Conditional Reports (TCRs), which were used to test specific functional processes. In addition, ORNL prepared the overall test order, managed tracking of problem reports and code uploads, and interacted with the testers throughout the entire testing period.

Because ORNL provided analysis and design for ICDB and because ORNL was intimately involved in development, it was unusual to be so deeply involved in system testing. This document reports on the testing process and on lessons learned.

ORNL also assisted MTMC during the initial implementation period and during transition from a developmental to a production system. A maintenance contractor was hired for ICDB, and ORNL assisted this contractor in preparing for system maintenance responsibilities. This document reports on this transition period also.
1. INTRODUCTION

1.1 BACKGROUND

The Worldwide Port System (WPS) Regional Integrated Cargo Database (ICDB) was designed and developed by personnel from the Military Traffic Management Command (MTMC) and personnel from Oak Ridge National Laboratory (ORNL). ICDB provides data integration and worldwide tracking capability for cargo that passes through common-user ocean cargo ports. ICDB is a data repository for the WPS terminal-level system, is a primary source for queries and cargo traffic reports, receives data from and provides data to other MTMC and non-MTMC systems, provides capabilities for processing booking records and cargo shipment documentation, distributes manifests, and provides regional managers with capabilities for managing cargo and monitoring cargo information. ICDB provides an integrated database for efficient and reliable data management, data manipulation, and data distribution.

Conforming to the requirements of Autostrad-2000 (A-2000), which implies an open systems design, ICDB resides on a Unix platform with Oracle7 as the relational database management system (RDBMS). The basic ICDB architectural design consists of a single worldwide central database server and multiple regional processing hubs. In the Continental United States (CONUS), there is a hub on each coast. ORNL was involved only in CONUS development. Port sites are connected to either a west or east coast hub. The primary source of data to ICDB is from the WPS terminal-level system, located at the ports.

System development started in early 1993. The WPS terminal-level system for CONUS functionality was developed by WPS personnel located at MTMC Western Area, Oakland, California. ICDB developers included ORNL personnel and MTMC personnel located at MTMC Information Management, Eastern Area (IME). Formal testing began in early 1995. Testing was completed, the system was accepted, and implementation began on the West Coast in August of 1995.

1.2 OVERVIEW OF THIS TASK

The WPS terminal-level system was implemented Outside the United States (OCONUS) prior to development of the CONUS WPS and ICDB. The OCONUS regional database for the
WPS terminal-level system is a data repository with ad hoc query capabilities, but the CONUS regional database (ICDB) is a sophisticated database with extensive state-of-the-art capabilities. Although the OCONUS WPS had successfully completed Major Army Information System Review Council (MAISRC) testing, the ICDB was significantly different; thus, it was required to undergo MAISRC review as a new system.

Tasking was assigned to ORNL to assist with writing test scenarios for the formal MAISRC testing of the functional requirements of ICDB. ORNL was provided a format for Test Conditional Reports (TCRs) and was assigned responsibility for writing TCRs to test the functionality of the system. Additional TCRs were written to test other portions (e.g., background processes, performance) of ICDB. Some of these TCRs were prepared by ORNL and some by the MAISRC test representative.

ORNL was asked to assist the maintenance contractor during the transition from a development mode to a working system. Because of the demands of development and testing, there was very little time to meet with and train the maintenance contractor. ORNL prepared a booklet of training materials and hosted two training sessions toward the end of ORNL's involvement in the project.

1.3 ACRONYMS AND INITIALISMS

A-2000 Autostrad-2000
CONUS Continental United States
DBA Database Administration
ECP Engineering Change Proposal
FD Functional Description
ICDB Integrated Cargo Database
IME Information Management, Eastern Area
MAISRC Major Army Information System Review Committee
MILSTAMP Military Standard Transportation and Movement Procedures
MTMC Military Traffic Management Command
OCONUS Outside the Continental United States
ORNL Oak Ridge National Laboratory
PMO Product Management Office
PR Problem Report
RDBMS Relational Database Management System
SA System Administration
SDT System Development Test
SQT System Qualification Test
1.4 REFERENCES


2. TESTING

Testing occurred throughout the development period at individual development sites for specific applications and for integration of the code among WPS, IME, and ORNL developers. These tests were limited by the state of development and the architectural platform at any particular point in time. In December 1993, a platform of production hardware was made available. In 1994, ORNL designed and developed a multi-threaded approach to database and code maintenance on the production architecture (the central server and two hubs). The three database threads, which are defined below, provided excellent opportunities for testing ICDB functionality and for managing changes to the developmental code.

- **DEMO.** This database was used by the MTMC ICDB Product Management Office (PMO) to demonstrate ICDB menus and screens to end users.
- **TEST.** This database was for testing of new code.
- **PROD.** After code and/or schema changes were tested (in the TEST thread), they were uploaded to PROD.

In late October until early December of 1994, PMO conducted intensive testing of the system as far as it could be tested at that time. This testing was limited by the fact that code to load data from ICDB into WPS had not been developed at that point in time, and, therefore, this major component could not be tested. During PMO testing, PMO wrote problem reports, and the responsibility for correction was assigned to either IME or ORNL. Most of the problems, though not all, were corrected prior to the end of 1994.

The primary purpose of this document is to report on the more official testing which occurred toward the end of the project (throughout the first nine months of 1995). These tests were monitored by MAISRC testers. The required tests were established by MAISRC and included the System Development Test (SDT) and System Qualification Test (SQT).

2.1 SCHEDULES FOR TESTING

Tests included semiformal (pre-SDT), formal (SDT-I and SDT-II), and very formal (SQT-I and SQT-II) formats. Table 2.1 gives the schedule for these tests.
Table 2.1. Formal testing schedule of the WPS Regional ICDB

<table>
<thead>
<tr>
<th>Test</th>
<th>Dates</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>pre-SDT</td>
<td>Jan 9-Jan 20, 1995</td>
<td>Oakland, California</td>
</tr>
<tr>
<td>SDT-I</td>
<td>Jan 30-Mar 3, 1995</td>
<td>Oakland, California</td>
</tr>
<tr>
<td>SQT-I</td>
<td>Apr 24-Jun 1, 1995</td>
<td>Oakland, California</td>
</tr>
<tr>
<td>SDT-II</td>
<td>Jul 10-Jul 21, 1995</td>
<td>Falls Church, Virginia</td>
</tr>
<tr>
<td>SQT-II</td>
<td>Aug 7-Aug 25, 1995</td>
<td>Oakland, California</td>
</tr>
</tbody>
</table>

When testing began with WPS, representatives of the ICDB development sites (ORNL, IME), PMO, and WPS met at Western Area, along with testers who were selected from the pool of future system users. WPS personnel made all arrangements for the test sites and for testing personnel.

The testing scenarios (TCRs) and the test plan established during SDT were used by MAISRC personnel for the SQT. In addition, MAISRC personnel developed a separate set of TCRs for testing performance — both capacity levels and timing. The TCRs for evaluating performance (see also Section 2.2.4) were used in SQT-I, SDT-II, and SQT-II only.

22 FUNCTIONAL TESTING AND TEST CONDITIONAL REPORTS (TCRs)

ORNL was a primary developer of ICDB and expected that an independent testing organization would be employed to prepare the testing procedures. MAISRC personnel were in charge of the testing process, developed the TCR format, and established the testing procedures as discussed in the following sections. However, ORNL was assigned the responsibilities of writing individual functional TCRs and developing the test order. WPS and PMO also wrote functional TCRs.

22.1 Purposes of TCRs

The purpose of the functional TCRs was to test specific requirements. Because the final test acceptance was determined by MAISRC personnel, a very clearly defined set of tests which
identified and tested each functional process was necessary. In addition, different testers were used in the formal tests (e.g., SDT, SQT); thus, the testers were unfamiliar with the system and had to learn how the system worked at the same time that they were trying to test it. The TCRs were a mechanism to provide sufficient control to both train and test at the same time.

22.2 Format of TCRs

The TCR format provided a very structured scenario for testing. The TCRs were written using a predetermined format established by MAISRC. A diskette with the established format using a word-processing software was provided to ORNL. The format is shown in Figure 2.1 (the front of a TCR form) and Figure 2.2 (the reverse side of a TCR). The front side of a sample TCR, as given to a tester, is shown in Figure 2.3. The reverse side was completed in hand writing by the tester during testing and retained by MAISRC personnel for a permanent record of test results.

In the TCR header block (see Figure 2.1), the following conventions were followed. "TCR No." was a shorthand identifier. TCRs initiated by ORNL used a numbering scheme based on the Functional Description (FD) requirements in the WPS FD, Appendix A, combined with the numbering scheme in the ICDB FD. TCRs initiated by WPS used a numbering scheme based on the cargo status as export or import. The "Date Prepared" and "Preparer's Name" were completed by the preparer. The next entry, "ECP No.," which stood for Engineering Change Proposal, was left blank during writing of the TCR. An ECP number was assigned if a routine problem was identified which did not require changes during the SQT. The ECP number allowed the problem to be tracked for future correction. The entry for "Input Medium" was always screen for the functional TCRs.

In the body of the TCR, the "Test Purpose" stated the functionality to be tested; "FD Reference" was a reference to the pages in the WPS FD, Appendix A, which provided a very brief explanation of the primary functions of ICDB; "Related Programs" listed particular preceding or following TCRs, technical TCRs (written by ORNL) to load required data, or technical TCRs (written by ORNL) to test background processes to ensure that the functionality was successful; "Condition to be Evaluated" was similar to "Test Purpose," although more concise.
<table>
<thead>
<tr>
<th>TCR NO.:</th>
<th>DATE PREPARED:</th>
<th>PREPARER'S NAME:</th>
<th>BCP NO.:</th>
<th>INPUT MEDIUM:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Screen</td>
</tr>
</tbody>
</table>

**TEST PURPOSE:**

**FD REFERENCE:**

**RELATED PROGRAMS:**

**CONDITION TO BE EVALUATED:**

**TEST PROCEDURES:**

**EXPECTED OUTPUT:**

**GENERATED TRANSACTIONS/REPORTS:**

**DATABASE CHANGES EXPECTED:**

---

Figure 2.1. Front page of TCR format used for testing.
TEST CONDITION REQUIREMENT (TCR)
WORLDWIDE PORT SYSTEM (WPS)

<table>
<thead>
<tr>
<th>TCR NO.:</th>
<th>RUN NO.:</th>
<th>DATE PREPARED:</th>
<th>PREPARER'S NAME:</th>
<th>ECP NO.:</th>
<th>INPUT MEDIUM:</th>
</tr>
</thead>
</table>

TEST RESULTS:

SUMMARY OF TEST RESULTS/OUTPUT GENERATED:

TEST CONTROL INFORMATION

DATE TESTED: ________________
PRINTED NAME/ORGANIZATION

SIGNATURE

() ACCEPTED  () NOT ACCEPTED

EXPLAIN:

() PR ________________  () ECP GENERATED ________________

DATE TCR ACCEPTED: ________________
ACCEPTANCE SIGNATURE: ________________

Figure 22. Reverse side of a TCR.
TEST CONDITION REQUIREMENT (TCR)
WORLDWIDE PORT SYSTEM (WPS)

<table>
<thead>
<tr>
<th>TCR NO.:</th>
<th>DATE PREPARED:</th>
<th>PREPARER'S NAME:</th>
<th>ECP NO.:</th>
<th>INPUT MEDIUM:</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4-112a2</td>
<td>June 1995</td>
<td>Truett</td>
<td></td>
<td>Screen</td>
</tr>
</tbody>
</table>

TEST PURPOSE: To ensure that manifest records reported on a hard-copy report of manifests failing quality validation routines can be corrected.

FD REFERENCE: WPS FD Appendix A, pp. 36-37.

RELATED PROGRAMS: G4-tech-112a1, WPS TCR to ensure that the corrected record is transmitted to the appropriate WPS site.

CONDITION TO BE EVALUATED: Error correction.

TEST PROCEDURES:

1. Log on as puser2.
2. Select Regional Processes (5); press Enter.
3. Select Print Reject Listing (4); press Enter.
4. Select Print Manifest Reject Listing (2); press Enter. When the pop-up window appears for identifying a printer, press F9 to obtain a list of available printers. Use the UP/DOWN arrow keys to identify the printer you desire to use; press Enter three times (to select the printer name, to continue, and to return to the application screen).
5. Obtain the printout of rejected records. Note the reject reason on the printout for rejected records. You will be correcting various records.
6. Use the UP/DOWN arrow keys to select Return to Regional Processes Menu (4); press Enter.
7. Select Edit Import Manifests (2); press Enter.
8. The cursor is in the Control NBR field. Enter the Control NBR from the listing printed earlier. Enter the Control NBR that matches TCN = MREJ00XXXXXXXXKK2. Press F8. Notes the reject reason on the listing invalid POD). Tab to POD and change the POD to 3DK. Press F10 to submit the revised POD and its associated trailer data.
9. Press S-F10 to exit the screen.
10. Repeat Steps 7-9 for TCN = MREJ00XXXXXXXXXXZK. Change POD to 3DK. Press F10 to commit.
11. Repeat Steps 7-9 for TCN = MREJ10BBXXXXXXXXXX. Change POD to 3DK. Commit.
12. Repeat Steps 7-9 for TCN = MREJ10XXXXXXXXXXKK2. Change PK to ZB. Commit.
13. Repeat Steps 7-9 for TCN = MREJ20 XX0X00XXXKK2. Change the TCN to MREJ20FINXXX00XXXKK2. Commit.
14. Repeat Steps 7-9 for TCN = MREJ20BBXXXXXXXXXX. Change PK to EX. Commit.
10. Exit.

EXPECTED OUTPUT: None.
GENERATED TRANSACTIONS/REPORTS: None.
DATABASE CHANGES EXPECTED: Corrected record is sent to WPS.

Figure 2.3. Sample of the first page of an actual TCR.
In the next block, the "Test Procedures" were clearly written, step by step. Each procedure began with a verb, and no action (either a choice of data to be entered or a key to be pressed) was left to random choice. Every act of the tester was very carefully orchestrated in advance.

The last section on the front page of the TCR listed the "Expected Output," "Generated Transactions/Reports," and "Database Changes Expected." The tester had the responsibility to ensure that the expected results documented in this section of the TCR matched the actual results demonstrated during the test. If data was passed to WPS, a follow-on TCR checked the conditions at the terminal.

22.3 TCR Usage

Each TCR tested a separate specific function of ICDB. A listing of all functional TCRs is provided in Appendix A. These TCRs were sorted into "test sets" which are discussed in Section 2.4, "Test Plan." All functional TCRs were written as if the user were accessing the functional menu and application screens of the ICDB user interface. This method was ideal for querying or for producing reports, and it was also ideal for the WPS terminal-level functionality of data entry. However, it was not adequate for testing any background processes (e.g., distributing code tables to the hubs and the WPS sites, resending data, and creating and sending data files to other organizations). These processes were initiated through screen applications and might appear to be successful to the functional user, but they actually occurred in the background and could not be checked through the user interface. To check these processes, the tester needed to be able to log into Oracle's SQL*Plus and create SQL*Plus queries to check local and remote Oracle tables. Therefore, ORNL wrote additional technical TCRs which were required for performing and/or testing the background processes. Actions required by the technical TCRs written by ORNL were performed by an ICDB or a WPS System Administrator (SA) or Database Administrator (DBA). A listing of these TCRs is provided in Appendix B.

Because certain kinds of records could enter the system either at the hubs or at WPS terminals, TCRs had to be written to test data flows from all data entry points. Therefore, the TCRs could be either "initiating" or "follow-on" depending on where data entered the system. In addition, records could enter the system either via on-line-build screens (manual data entry) or via flat files that were then processed through validation routines (batch data entry).
For manual data entry, testers were given precise instructions on the data to be entered. For batch data, the flat files were also prepared in advance in order to maintain control. Printouts of the flat file layout of records in Military Standard Transportation and Movement Procedures (MILSTAMP) 80-column format were provided to testers. (Additional information about the data used for testing is supplied in Section 2.3.)

If data entered the system at one of the ICDB hubs, the ORNL TCRs were written from a point of view which tested data initiating at the hubs. WPS wrote follow-on TCRs to test the receipt of that data at the appropriate terminal. The TCRs normally instructed the user to view a specific record on both ICDB and WPS screens and in the flat file printout (for batch-loaded records). The TCRs for these tests are listed in Appendix A, Test Sets 1-1 through 1-24. When the data displayed at ICDB did not equal the data displayed at WPS or when the data at either site did not agree with the flat file layout, a problem was noted. (Additional information about problem reporting is given in Section 2.5.)

If data entered the system at the WPS sites (either as a new record or as status changes), WPS personnel wrote the initiating TCRs, and the follow-on TCRs (written by ORNL and PMO) tested the receipt of that data at the central database. The primary purpose of the follow-on TCR was to ensure that data displayed on the WPS terminal-level screen could also be viewed correctly in ICDB, if required. (Some fields were specific to terminal-level processing and did not appear in ICDB.) A list of these TCRs is given in Appendix A, Test Sets 2-1 through 2-10.

In addition, some ORNL TCRs tested functionality that did not require WPS follow-on testing. And some WPS TCRs did not require follow-on testing at ICDB. These TCRs are also included in the Test Sets listed in Appendix A.

22.4 Technical (MAISRC) TCRs

A totally separate set of technical TCRs was written and tested by the MAISRC test administrator using the same format as was used for the functional TCRs. These technical TCRs tested the following processes: (1) communication processing and the automatic switching from network access to modem access when a normal communication line was unavailable, (2) performance times for queries based on number of users logged in, (3) performance times for transferring specified numbers of records based on the total
number of records in the database, (4) performance times for transferring specified numbers of records from several sites almost simultaneously, (5) ability of users to log in via a 1-800 number, (6) data extracts production of and acceptance by appropriate receiving agencies, (7) security, and (8) backup and restore capabilities.

ORNL reviewed the technical TCRs prepared by MAISRC. During the technical testing, ORNL also supported the testing agency (MAISRC) and responded to issues and problems. The technical testing was very significant because it tested major components of the system (e.g., communications, performance, and automated data extraction). This report, however, emphasizes the functional testing because ORNL did not write the TCRs for the technical tasks. The results of the performance testing are addressed in Section 2.6.

2.3 DATA FOR TESTING FUNCTIONAL TCRs

Obtaining a large volume of data for testing was a major problem. Although MTMC, through the Area Commands, provided certain test data sets, these did not cover all conditions. The PMO established a plan for constructing data sets that would ensure a sample of data within each commodity category (e.g., hazardous, personal property, ammunition). MTMC transportation managers use a Transportation Control Number (TCN) to identify cargo shipments. The PMO plan was to alter this 17-position TCN identifier in such a way that it would provide the following information for test purposes: port indicator (for those ports being used in the test), type of cargo (i.e., containerized or breakbulk), commodity type, container number or piece count, and content number. The remaining positions in the revised TCN were usually filled with "X"s except in special cases (e.g., personal property shipments and unit moves). This TCN structure was provided to the testers as an attachment to the TCRs and was cross-referenced in the TCRs. The PMO also determined that a certain number of each type of record would be required. This information was also provided to the testers. The TCN structure for the test data sets and the list of TCNs in each category are provided in Appendix C.

The original intention of PMO was to obtain sufficient "real" data for each of the appropriate categories and then change the TCNs to match the format shown in Appendix C. However, because of problems on the IME hardware and because cargo in every record category was not shipped during the time frame for obtaining records, actual data for all cargo types was not obtained. Because the TCRs were written in such a precise manner, the exact TCNs were
needed to complete the TCRs. As time grew closer to actual testing and ORNL could not complete the TCRs, ORNL personnel constructed the test data sets from the available data.

ORNL selected files of "real" data, either cargo shipment records or manifests. Because of the desire to have example data from multiple cargo "types," the raw data files were occasionally modified from the "real" data sets. For example, some cargo shipment records were used to make manifest records and some manifest records were modified as cargo shipment records. In addition, the preliminary booking data was adapted from cargo shipment records to ensure that the records would match.

These data sets were used as input to the system (to ensure that certain records with specific TCNs would be available to the testers). The flat files were also printed out, and this hard-copy of the record layouts was provided to the testers. This flat-file record layout was lengthy and is not reproduced in this document. Other data sets were also formulated by ORNL as needed. A list of all of the types of data that was reproduced is given in Appendix D.

Because of the way the data was derived, sometimes the data was "inaccurate." For example, the flat file of data for a cargo shipment might contain a field that was actually a manifest field (e.g., stow location). Although the system was intelligent enough to know during the processing of this file not to insert data into a stow location field in the database for a shipment record of cargo that had not actually been stowed, the appearance of this piece of data on the printout of the flat file was confusing to the testers. Therefore, the testers were instructed to ask the Test Coordinator for assistance if they were unsure about the data in a field.

Sometimes the testers were confused because of system functionality with which they were unfamiliar. For example, ICDB was designed to re-compute the pieces, weight, and cube for a van based on a sum of all of the content records. Therefore, the total summed value for the pieces, weight, and cube of a van's contents on the flat file printout might not agree with the data contained in the database and displayed on the screen. The tester was invited to test the computational powers of the system by summing the pieces, weight, and cube of each content record for the van.

The TCRs that tested the on-line build functionality of the system also had certain limitations, primarily based on the tester's data entry abilities. (For example, the tester performing data entry might type "abcdefg," rather than "mnopQRS" for a van number. When a tester using a
separate TCR queried for van number "mnopqrs" using the instructions on the TCR, that van
number would not exist because it had been mistyped.) Caveats were built into user
instructions for this occurrence. Testers were reminded that records built via the on-line build
screens did not always conform to the instructions provided in the TCR. Therefore, if there
was a discrepancy, the tester was instructed to check with the Test Coordinator.

It is important to note that the data sets described above were developed and used ONLY
for the formal tests described in this document. "Real" data was used throughout ICDB
development for site and integration testing. It is only when using actual real-world data that
real-world problems can be identified.

2.4 TEST ORDER

Prior to formal testing, PMO designed the format for a form that could be used to provide
order to the testing. ORNL was assigned the responsibility to further develop this test order
to ensure that all functionality would be tested. Because some of the intelligence in ICDB is
to match records based on certain criteria (e.g., cargo shipment records to booking records),
the data had to be loaded in a certain order to test all conditions. The sequence in which data
entered the database affected how the information was incorporated into the cargo record,
and a careful control of the sequencing was required to test this logic. ORNL developed a
two-phase approach as the most efficient method. This allowed testing of the WPS terminal-
level data entry to proceed at the same time that data was being entered at the Hubs. This
dual process of adding data at two sources concurrently was possible because different record
identifiers were used. It helped to speed up the data entry part of the test. The test order (a
blank copy is reproduced in Appendix E) allowed the test coordinator to maintain control of
the processes and to ensure that they occurred in the appropriate sequence. The test sets
listed in Appendices B and A, respectively, are referenced in the second and third columns
of the test order (Appendix E). Each day, primary contacts from ORNL, IME, PMO, and
WPS met with the MAISRC tester to update the test order.

2.5 PROBLEM REPORTS AND CODE UPLOADS

During SQT, when testers identified problems, they initiated a problem report (see Appendix
F, Figure F.1). At the end of each day, personnel from WPS, ORNL, PMO, and IME, met
with the MAISRC coordinator to determine if a problem report was really a problem or a misunderstanding on the tester's part. If a problem actually existed, a priority was assigned, and the responsibility for correction was determined. Then the problem was assigned a Problem Report (PR) number and was logged in as needing correction. If the responsibility for correction fell to WPS, usually the problem report was not entered into the log because the functionality of the terminal-level system was outside of the purview of testing for the WPS Regional ICDB.

A procedure was established for uploading code to fix the problems (see Appendix F, Figure F.2). After a correction had been made by the responsible developing agency, ORNL performed all uploads to ICDB, whether the problem was fixed by ORNL, by IME, or by WPS. The terminal-level system had already been approved through the formal MAISRC testing process. Therefore, if the problem was strictly a terminal-level issue, then WPS controlled code uploads to the WPS test system and the problem report was not a formal part of the testing documentation.

Once code had been revised and the fix tested on the development system, ORNL would request a code upload. The MAISRC test coordinator would approve the upload, and the TCR which was being used for testing when the problem report had been written would be used for retesting. In some cases an entire test set of functional TCRs would need to be retested in order to retest one TCR. Based on the results of retesting, the problem log would be updated.

2.6 PERFORMANCE TESTING

Performance testing was of two types: inquiry response time (including reports production) and data transfers/loads with a full database (9 million rows). These performance requirements are given in Appendix G.

Prior to testing with a fully loaded database, all performances easily met required timeframes. Based on ORNL experience, performance tuning is best done with a large amount of data;

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2These priorities were "Emergency" conditions, requiring 24-hour turnaround time for corrections; "Urgent" conditions, requiring correction as quickly as possible; and "Routine" changes, which did not require changes prior to implementation. These labels were assigned according to DA Pamphlet 25-6, "Configuration Management for Automated Information Systems."
Therefore, ORNL had done no performance tuning with the limited data available. Because of other commitments and the prolonged functional testing schedule, MTMC was unable to obtain 9 million rows of cargo data early enough to do performance testing in advance. Therefore, no performance testing was conducted until the end of the first SQT.

Thus, because the system had never been tested with a significant amount of data, ORNL expected that performance tuning would be required, and, when a full database was loaded, performance was identified as a significant problem for both (1) inquiries and (2) data transfers.

The inquiries were performed from the user interface screens (see Appendix G, first, second, fourth, and sixth activities listed). When the system could not meet performance requirements for inquiries, ORNL personnel analyzed the problems and added some additional indexes. This solved the majority of the performance problems for inquiries.

When the system could not meet performance requirements for data transfer processes (see Appendix G, seventh through tenth activities listed), it was a much larger problem and more difficult to solve. The transfer and conversion processes were complicated; usually a single transfer process called many different scripts and procedures.

ICDB was required to poll each WPS terminal site every five minutes and pull all changed records (up to a maximum of 1000 records). This requirement was tested after the requirements for the user interface inquiries had been passed. The data transfer and loading processes had always been very rapid, until the database contained 9 million rows. The procedures for inserting and/or updating 1000 records into a database of this size totally failed the 5-minute requirement. Analyzing the performance problems (while still testing functional ECPs) and finding and implementing solutions took considerable time during the last week of SQT-I. ORNL could not analyze and tune all of the data transfer procedures. Therefore, SDT and SQT had to be repeated after a one-month interruption for performance tuning.

During this month, MTMC personnel, the Oracle corporation, ORNL, and other MTMC contractors worked to tune database parameters, scripts, and procedures. The month was adequate to identify primary performance problems and determine the best solutions. Also, an upgrade to the next version of Oracle's RDBMS was required to use the Trace utility. Oracle's Trace showed exactly which statements were slowing down performance for known
problems. ORNL was able to rewrite the data transfer procedures in order to significantly improve performance.

During the month allotted for performance tuning and the Oracle upgrade, ORNL also rewrote scripts for performing backups and assisted MTMC in establishing guidelines for ensuring that MTMC personnel responsible for backup and restore procedures had an established protocol for completing these responsibilities.

2.7 RESULTS OF TESTING

After the first SQT, ORNL and PMO spent one month upgrading and tuning the system. Then SDT-II retested functionality and performance to ensure that everything was functioning as expected. SQT-II began shortly after SDT-II and was completed in only half the time that had been spent on SQT-I. The system was accepted and implementation began the next weekend!
3. TRANSITION

There is a charged atmosphere when transitioning a development software system into production. The exercise is no longer a practice; it is no longer in testing; it is being put into use. ORNL was not present at the WPS sites or the ICDB hubs or the central server when the system "went live," but ORNL personnel were available to provide assistance and/or advice when needed. This section is a brief overview of the first few weeks of implementation, during which developmental control of the software and maintenance of the software passed from ORNL to MTMC and the maintenance contractor.

3.1 IMPLEMENTATION

Implementation of the system began on the weekend following the successful conclusion of SQT II. As real-world users began using the system, unforeseen problems related primarily to (1) data and (2) performance tuning occurred. After less than three months of actual operation, most CONUS terminals were transitioned into WPS sites, and the data feeds to/from ICDB continued to grow in number and size. Performance tuning situations continued to show up. Although the performance problems that were identified and fixed prior to SQT-II remained "fixed," as new sites were implemented and the volume of data increased, other performance problems arose. ORNL worked with the PMO as requested to resolve these problems during the transition period.

3.2 TRANSITION TO A MAINTENANCE CONTRACTOR

The ORNL team was gradually phased out as the maintenance contractor was brought on. ORNL prepared a "training" document and hosted maintenance contractor personnel for two visits. The training document covered the major components of the system as well as methods for trouble-shooting and performance tuning. The sections of the training document included the following:

- an overview of how/why the system was designed,
- system administration/database administration functions,
- an overview of the "will to live" and communications,
• data transfers to other organizations,
• data transfers from/to the server, hubs, and sites,
• user interface processes,
• trouble-shooting strategies, and
• performance tuning strategies.

The section on troubleshooting used a philosophy that was very valuable to ORNL during the analysis of problems identified during testing. The process included saving data into temporary tables at various stages during data transfer and conversion. Saving data (even temporarily) becomes a performance issue in a real-world situation, and this strategy is no longer used for analyzing problems.

ICDB is an extremely complicated system, and the transition was not altogether smooth. Telephone conferences were valuable. Also, two subcontractors who had been with the ORNL development team for a lengthy period of time were put on contract by the maintenance contractor during the transition. This decision has proved to be very useful.

Because the schedule for testing, fixing, and retesting the code was so short, ORNL staff had very little time when they could be available to the maintenance contractor. During the spring and summer of 1995, some ORNL staff members were often on the West Coast for formal testing. The remaining staff members were supporting the testing effort by addressing those problems that were written up as emergency or critical problem reports.

During SQT II, the maintenance contractor was still staffing positions for the group that would be maintaining the system. They were also getting hardware and software installed to "imitate" the PMO system. They were still working on this task during the last month that ORNL was on the project, so many of the emergency situations that occurred as new sites were added to the "live" system were handled by ORNL and the PMO. Because of these situations and time constraints, the maintenance contractor had little experience with dealing with system problems before they took over maintaining the system.
4. LESSONS LEARNED

ORNL participated actively in the ICDB formal testing process, both in writing the TCRs and in on-site assistance. As a means to an end, the process was worth the time and effort expended. However, from the point of view of resource utilization (ORNL personnel spent the better part of a year on the West Coast), ORNL generally felt that there might have been a better way to accomplish the same results. It certainly would have been more convenient for East Coast residents to have conducted more of the tests on the East Coast; however, the testing was performed in connection with the terminal system whose developers were located on the West Coast. The following list represents the "lessons learned" on both the testing process and the transition period from an ORNL perspective.

* The most important lesson learned is that all testing, including all functionality, integration of code developed at different sites, and technical testing, should have been completed successfully prior to ANY formal, controlled testing. Although each site was responsible for testing the code developed by that site, ORNL was responsible for integrating all modules. Much of the ORNL code written for communications and data transfers could not be tested until development activities at other sites were complete. Thus, it was impossible to test all of the ORNL code in advance. Additional time should have been provided for integration testing.

* In-process reviews of code and functionality were conducted; however, deficiencies were not always corrected in a timely manner. The easy solutions seemed to be accomplished quickly, but the hard problems continued to plague integration testing for much longer than reasonable.

* Less time spent in repetitive testing of the same functions and more time for fixing problems would have been a more efficient use of time. There was hardly time to fix problems before another test (more travel) was scheduled.

* TCRs were not an effective way to test a system because they listed specific steps and used canned data to produce expected results. Nothing was random, and many functional inaccuracies were noticed only when testers stopped using TCRs and just tried to "break" the system.

* The TCRs might have been more effective if someone other than the developers had written them and if they had been prepared earlier. For example, TCRs for some modules were written almost at the last minute because the modules were incomplete or were being revised.
There were a lot of TCRs written for the functional requirements, but one whole subsystem (SA/DBA) was never tested in this manner. It seems to be rather robust; therefore, perhaps the system personnel who used it did a better job of testing than was done through the TCRs.

End-to-end testing before all components were operational was a mistake. It cost a tremendous loss of resources (time and money) to fly the testers and the developers who were supporting the testing to the West Coast for lengthy periods of time, especially when they had to wait for fixes to code that had never previously been tested.

For the developer to provide test data and test scenarios was not wise. PMO determined that TCRs required data sets with certain characteristics and specific TCNs and planned to develop these data sets. Because ORNL did not have the functional knowledge of MTMC data to make all appropriate changes, ORNL's conversion of cargo shipment records to manifest-type records and vice versa caused a lot of unnecessary confusion for the testers.

Large data sets (9,000,000 database rows) should have been available for performance testing prior to SQT. Performance testing for the first time during SQT caused the failure of the first SQT.

New requirements were reassigned from IME to ORNL and to WPS just prior to and during SDT and the first SQT. This functionality was not ready for informal integration testing prior to formal testing, and a lot of the functionality failed SQT.

Testing of data that originated at the hubs was difficult because the WPS process for loading data from the hubs into the terminal system was inconsistent and undependable. This particular process continued to cause problems through SDT-II. The ability of WPS to accept data from the hubs should have been available much earlier than it was, with sufficient time to test and retest this process prior to any formal testing.

The testing process was one method of convincing the end-users of the system that the system was effective. Additional training was also provided.

Either the maintenance contractor should have been on board much sooner or ORNL should have remained on active status much later. The many small problems which occurred upon implementation would have been much easier for ORNL personnel to identify and fix than they have been for the maintenance contractor, who was unfamiliar with the system.
5. CONCLUSIONS

Frequently research and development organizations are immersed in the research, but never reach the end of the development stage. The ORNL team worked from initial requirements gathering, through requirements analysis, and through design activities; they assisted with development tasks, integrated the system components (both software and hardware), participated in testing, provided assistance during initial implementation, and provided partial training materials to the maintenance contractors.

The system testing period was a time filled with a great deal of stress brought about by the tight deadlines and the formal testing environment. Some tasks that were assigned to other organizations were completed by ORNL in order to ensure that they were completed. Though having ORNL write the TCRs for testing was unexpected, it provided a valuable experience with this highly-structured testing methodology.

In the real world, both government and industry must be cost-conscious. It is imperative to accomplish as much as possible within as short a time as possible with whatever resources are available. The very formal SOT with structured TCRs that provided documented evidence and were repeatable as often as necessary provided this environment.

The ORNL team derived substantial satisfaction from the success of ICDB. The project ended with goals met.
APPENDIX A

LIST OF FUNCTIONAL TCRs SORTED BY TEST SET
LIST OF TCRs SORTED BY TEST SETS

PHASE 1: RECORDS ORIGINATING AT THE REGIONAL DATABASE AND PASSED TO WPS VIA ONE HUB

Note: Sets 1-1 through 1-9 test processing of booking and ATCMD records from the Regional to WPS sites

Pass/Fail

Set 1-1: Test booking data load
- R1-113-BKG-1 Data loads of batch loads of booking data (from METS)
- R1-113-BKG-2 Data loads of batch loads of booking data (from METS)
- R1-113-BKG-3 Data loads of batch loads of booking data (from METS)

Set 1-2: Test matchup of booking and ATCMD data
- R1-113-BKG-4 Matches of batch booking and batch ATCMDs (booking loaded first)
- R1-113-BKG-5 Data loads of batch loads of booking data with no matches to ATCMDs

Set 1-3: Build ATCMDs on-line at the Regional
- R1-121-exp02 Add export van records with single consignee
- R1-121-exp03 Add export van HHG records
- R1-121-exp04 Add export van POV records
- R1-121-exp05 Add export van ammo records
- R1-121-HAZ Add export van hazardous records
- R1-121-exp06 Add export refrigerated van records
- R1-121-exp07 Add export van records with three stopoffs
- R1-121-exp08 Add export breakbulk records
- R1-121-exp10 Add export HHG breakbulk records
- R1-121-exp11 Add export POV breakbulk records
- R1-121-exp12 Add export ammo breakbulk records
- R1-121-exp13 Add export unaccompanied baggage breakbulk records
- R1-121-exp14 Add export government vehicle breakbulk records
- R1-121-exp14A Add export outsize breakbulk records
- R1-121-exp15 Add export mail breakbulk records

Set 1-4: Remaining TCRs to test load of ATCMD data
- R1-113-ATCMD-1 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-2 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-3 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-4 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-5 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-6 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-6A Data loads of batch loads of ATCMD data
- R1-113-ATCMD-7 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-8 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-9 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-12 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-13 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-14 Data loads of batch loads of ATCMD data
- R1-113-ATCMD-15 Data loads of batch loads of ATCMD data

TCR List by Test Set 1

August 2, 1995
Set 1-5: Building remaining ATCMDs on-line at Regional
R1-121-exp16 Add export classified breakbulk records
R1-121-exp17 Add export sensitive breakbulk records
R1-121-exp18 Add export controlled breakbulk records
R1-121-exp19 Add export hazardous cargo breakbulk records
R1-121-exp21 Add export empty van records
R1-122-BKG-VAN1 Recall existing container booking data for populating the online build screen
R1-122-BKG-VAN2 Add container booking data to test matchups with batch-loaded booking records
R1-122-refuse Refusal to allow changes via on-line build to an existing ATCMD record

Set 1-6: Test matchup of booking and ATCMD data
R1-113-BKG-6 Matches of batch-loaded booking data and on-line-built ATCMDs
R1-113-BKG-7 Matches of batch-loaded booking data and on-line-built ATCMDs
R1-113-BKG-8 Matches of batch-loaded booking data and ATCMDs (ATCMD loaded first)

Set 1-7: Resend/divert ATCMDs
T6-118a1 Resend ATCMDs by container nbr
T6-118a3 Resend and Divert ATCMDs by container no.
T6-118b1 Resend ATCMDs by TCN
T6-118b2 Divert ATCMDs by container no.
T6-118b2-ext Divert van with CONEX
T6-118b3 Resend and Divert ATCMDs by container no.
T6-118-WPS View Divert to Seattle

Set 1-8: Correct rejected ATCMD record
G4-112a1 ATCSD error correction and resubmission

Set 1-9: Correct invalid TACs
G4-112a3 TAC correction

Set 1-10: View corrections on WPS
G4-112-WPS View corrections to ATCMDs
Note: Sets 1-22 through 1-24 test processing of import manifest records from the Regional to WPS sites

Pass/Fail

Set 1-22: Test load of import manifest data
- R3-21-import-1: Receipt of import manifest data from OCONUS sources
- R3-21-import-2: Receipt of import manifest data from OCONUS sources
- R3-21-import-3: Receipt of import manifest data from OCONUS sources
- R3-21-import-4: Receipt of import manifest data from OCONUS sources
- R3-21-import-5: Receipt of import manifest data from OCONUS sources
- R3-21-import-6: Receipt of import manifest data from OCONUS sources
- R3-21-import-6A: Receipt of import manifest data from OCONUS sources
- R3-21-import-7: Receipt of import manifest data from OCONUS sources
- R3-21-import-9: Receipt of import manifest data from OCONUS sources
- R3-21-import-9A: Receipt of import manifest data from OCONUS sources
- R3-21-import-10: Receipt of import manifest data from OCONUS sources
- R3-21-import-11: Receipt of import manifest data from OCONUS sources
- R3-21-import-12: Receipt of import manifest data from OCONUS sources
- R3-21-import-13: Receipt of import manifest data from OCONUS sources
- R3-21-import-14: Receipt of import manifest data from OCONUS sources
- R3-21-import-15: Receipt of import manifest data from OCONUS sources
- R3-21-import-16: Receipt of import manifest data from OCONUS sources
- R3-21-import-17: Receipt of import manifest data from OCONUS sources
- R3-21-import-18: Receipt of import manifest data from OCONUS sources

Set 1-23: Resend and divert manifests
- T2-24a1: Resend entire import manifest by VOYDOC to same port
- T2-24a2: Divert entire import manifest by VOYDOC to a changed port
- T2-24b1: Resend individual manifested container records by van nbr to same WPS POD
- T2-24b2: Divert individual manifested container records by van nbr to changed WPS POD
- T2-24c1: Resend individual manifested records by TCN to same WPS POD
- T2-24c2: Divert individual manifested records by TCN to a changed WPS POD

Set 1-24: Correct rejected manifest record
- G4-112a2: Import manifest error correction and resubmission

Set 1-50: Test all intransit visibility requirements
- G1-41a1: Retrieval of cargo status based on full TCN
- G1-41a2: Retrieval of cargo status based on partial TCN
- G1-41b1: Retrieval of cargo records based on container number
- G1-41c1: Retrieval of cargo records based on SSN
- G1-41d3: Retrieval based on last name

Note: Sets 1-50 through 1-59 test processing of general requirements
<table>
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<tr>
<th>Test Set</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1-41e1</td>
<td>Count of records retrieved</td>
</tr>
<tr>
<td>G1-41e2</td>
<td>Count of records retrieved</td>
</tr>
<tr>
<td>G1-41e3</td>
<td>Count of records retrieved</td>
</tr>
<tr>
<td>G1-42a1</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
</tr>
<tr>
<td>G1-42a2</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a3</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a5</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a7</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a11</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a12</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
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<tr>
<td>G1-42a16</td>
<td>Retrieval of cargo records (Multi Ship-Detail/All Cargo Types)</td>
</tr>
<tr>
<td>G1-42b1</td>
<td>Retrieval of cargo records (Multi Ship-Detail/Hazardous/Explo)</td>
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<tr>
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<td>Retrieval of cargo records (Multi Ship-Detail/Commodity CD)</td>
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<tr>
<td>G1-43g</td>
<td>Retrieval of cargo records (Multi Ship-Summary)</td>
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</table>
Pass/Fail

**Gl-43h**
Retrieval of cargo records (Mult Ship-Summary)

**Gl-43m**
Retrieval of cargo records (Mult Ship-Summary)

**Gl-43n**
Retrieval of cargo records (Mult Ship-Summary)

**Gl-43o**
Retrieval of cargo records (Mult Ship-Summary)

**Gl-44a1**
User's roles to control data access

**Gl-44a2**
User's roles to control data access

**Gl-44a3**
User's roles to control data access

**Gl-44a4**
User's roles to control data access

**Gl-44a5**
User's roles to control data access

**Gl-44a6**
User's roles to control data access

**Gl-44a7**
User's roles to control data access

**Gl-44a8**
User's roles to control data access

**Gl-46a1**
List of values on queryable columns screens.

**Gl-46a2**
List of values on queryable columns screens.

**Gl-46a3**
List of values on queryable columns screens.

**Gl-46a4**
List of values on queryable columns screens.

**Gl-46a5**
List of values on queryable columns screens.

**Gl-46b1**
List of values on response screens

**Gl-46b2**
List of values on response screens

**Gl-46b3**
List of values on response screens

**Gl-46b4**
List of values on response screens

**Gl-46b5**
List of values on response screens

**Gl-46b6**
List of values on response screens

**Gl-46b7**
List of values on response screens

**Gl-46b8**
List of values on response screens

**Gl-46b9**
List of values on response screens

---

**Set 1-51:** Resend GTN files; change frequency of transmittal for GTN files

**T3-gtn3**
Resend data extracts to GTN

**T3-gtn4**
Change timeframes for sending files to GTN

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**Set 1-51A:** Change frequency of transmittal for GTN files

**T3-gtn4A**
Ensure that frequency for sending files to GTN is set to 6 hours

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**Set 1-52:** Resend non-GTN files

**T1-datax3**
Resend capabilities for non-GTN recipients

---

**Set 1-53:** Test Reports production

**G5-exp-onhand**
Functionality to produce export onhand shippable cargo list

**G5-exp-hhg/pov-onhand**
Functionality to produce export hhg/pov onhand shippable cargo list

**G5-exp-baz/exp-onhand**
Functionality to produce export hazardous/explosive shippable cargo list

**G5-imp-onhand**
Functionality to produce import cargo list

**G5-imp-hhg**
Functionality to produce import hhg cargo list

**G5-imp-pov**
Functionality to produce import pov cargo list

**G5-imp-baz/exp**
Functionality to produce import hazardous/explosive shippable cargo list

**G5-tcmd-eff**
Functionality to produce the TCMD Shipper Error Listing

**G5-command-ton**
Functionality to produce command tonnage report

**G5-mnfst-recap**
Functionality to produce manifest recap M/T by POE report

---

TCR List by Test Set

5

August 2, 1995
Set 1-54: Test code table maintenance to add codes

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6-code1</td>
<td>Identification of code tables centrally maintained and distributed to WPS</td>
</tr>
<tr>
<td>G6-code2</td>
<td>Identification of code tables centrally maintained, not distributed to WPS</td>
</tr>
<tr>
<td>G6-comm-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-commg1-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-commg2-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-cdist-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-damage1-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-damage2-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-damage3-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-delreason-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-flag-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-goods-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-hndling-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-numconv-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-ocarr-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-opcode-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-pkg-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-port-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-shipstatus-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-tac-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-typecd-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-typevs1c1-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-vanownr-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-vstat-add</td>
<td>Functionality to add a new code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-cancel-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-delay-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-dodaac-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-gbl-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-ldgterms-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-mode-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-ship-add</td>
<td>Functionality to add a new code (non-distributed functionality)</td>
</tr>
<tr>
<td>G6-add-WPS</td>
<td>View additions to Edit Tables in WPS</td>
</tr>
</tbody>
</table>

Set 1-55: Test code table maintenance to modify a code

<table>
<thead>
<tr>
<th>Function</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G6-comm-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-commg1-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-commg2-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-cdist-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-damage1-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
<tr>
<td>G6-damage2-mod</td>
<td>Functionality to change a code and/or the description of a code (centrally distributed functionality)</td>
</tr>
</tbody>
</table>

TCR List by Test Set 6  
August 2, 1995
G6-damage3-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-delreason-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-flag-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-goods-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-hndling-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-numconv-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-ocearr-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-opcode-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-pkg-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-port-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-shipstatus-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-tac-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-typecd-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-typevslcd-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-vanownr-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-vstat-mod Functionality to change a code and/or the description of a code (centrally distributed functionality)
G6-cancel-mod Functionality to change a code and/or the description of a code (non-distributed functionality).
G6-delay-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-dodaac-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-ldgterms-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-mode-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-ship-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-gbl-mod Functionality to change a code and/or the description of a code (non-distributed functionality)
G6-mod-WPS View modifications to Edit Tables in WPS
Set 1-56: Test code table maintenance to delete a code

- G6-comm-del: Functionality to delete a code (centrally distributed functionality).
- G6-commg1-del: Functionality to delete a code (centrally distributed functionality).
- G6-commg2-del: Functionality to delete a code (centrally distributed functionality).
- G6-cdist-del: Functionality to delete a code (centrally distributed functionality).
- G6-damage1-del: Functionality to delete a code (centrally distributed functionality).
- G6-damage2-del: Functionality to delete a code (centrally distributed functionality).
- G6-damage3-del: Functionality to delete a code (centrally distributed functionality).
- G6-delreason-del: Functionality to delete a code (centrally distributed functionality).
- G6-damagel-del: Functionality to delete a code (centrally distributed functionality).
- G6-damage2-del: Functionality to delete a code (centrally distributed functionality).
- G6-damage3-del: Functionality to delete a code (centrally distributed functionality).
- G6-ocarr-del: Functionality to delete a code (centrally distributed functionality).
- G6-opcode-del: Functionality to delete a code (centrally distributed functionality).
- G6-pkg-del: Functionality to delete a code (centrally distributed functionality).
- G6-port-del: Functionality to delete a code (centrally distributed functionality).
- G6-shipstatus-del: Functionality to delete a code (centrally distributed functionality).
- G6-tac-del: Functionality to delete a code (centrally distributed functionality).
- G6-typecd-del: Functionality to delete a code (centrally distributed functionality).
- G6-typevslcd-del: Functionality to delete a code (centrally distributed functionality).
- G6-vanownr-del: Functionality to delete a code (centrally distributed functionality).
- G6-vstat-del: Functionality to delete a code (centrally distributed functionality).
- G6-cancel-del: Functionality to delete a code (non-distributed functionality).
- G6-delay-del: Functionality to delete a code (non-distributed functionality).
- G6-dodaac-del: Functionality to delete a code (non-distributed functionality).
- G6-gbl-del: Functionality to delete a code (non-distributed functionality).
- G6-ldgterms-del: Functionality to delete a code (non-distributed functionality).
- G6-mode-del: Functionality to delete a code (non-distributed functionality).
- G6-ship-del: Functionality to delete a code (non-distributed functionality).
- G6-del-WPS: Verify deletions to Edit Tables in WPS

Set 1-57: Reviewing outstanding discharge dates: entering/checking discharge dates

- R6-disch-dts: Reviewing vessels with outstanding discharge dates.
- R6-voy4: Dates entered by functional manager.
- R6-voy5: Dates received from OCONUS via TTU data extract.

Set 1-58: Checking discharge dates

- R6-voy5: Dates received from OCONUS via TTU data extract.
Set 1-59: Utilities
  G6-util-unix1  Printing UNIX files (not IQ) to user's PC
  G6-util-unix2A Downloading UNIX files (not IQ) to user's PC drive A
  G6-util-unix2B Downloading UNIX files (not IQ) to user's PC drive B
  G6-util-unix2C Downloading UNIX files (not IQ) to user's PC drive C
  G6-util-iq1   Printing IQ files to user's PC
  G6-util-iq2A Downloading IQ files to user's PC drive A
  G6-util-iq2B Downloading IQ files to user's PC drive B
  G6-util-iq2C Downloading IQ files to user's PC drive C

Set 1-60: Export Manifest distribution
  Reg-G-mfst-001 Distributing export manifest files

Set 1-61: Export Manifest distribution
  Reg-G-mfst-002 Printing export manifest at Hub

Set 1-62: Export Manifest distribution
  Reg-G-mfst-003 Prepare export manifest distribution tables at Hub

Set 1-63: IQ
  RG-IQ-001 Use of IQ for ad hoc queries

Set 1-64: IQ
  Reg-G-Port-to-Port Process to add/change/delete unit cargo

Set 1-70: WPS autoload of a dataset with multiple data conditions
  GTR-01 Dataset to test interfaces, reports, etc.

Set 1-71: WPS tally transactions on selected records and vessels
  Import tally transaction 01 Discharge records on import manifests
  Import tally transaction 02 Discharge vessel on import manifests
  Import tally transaction 03 Disposition records on import manifests
  Export tally transaction 01 Receipt records on export cargo

Set 1-72: WPS loading of records to test reject processing
  Export T06-rej Rejected duplicate records

Set 1-73: WPS manifest call (export manifest)
  MFST-Call-WPS Call of manifest at WPS terminal
PHASE 2: RECORDS ORIGINATING AT WPS AND PASSED TO THE REGIONAL DATABASE VIA ONE HUB

Set 2-1: Perform export data loads (R2-Export-xxx on Regional)

Export 01 Add - Vessel Control Register and export onload from floppy
Export 02 Add - Van records with single consignee
Export 03 Add - Van HHGS records
Export 04 Add - Van POV records
Export 05 Add - Van AMMO records
Export 06 Add - Refrigerated Van records
Export 07 Add - Breakbulk records
Export 08 Add - Breakbulk records
Export 09 Add - Breakbulk records
Export 10 Add - General Cargo Breakbulk records
Export 11 Add - HHGS Breakbulk records
Export 12 Add - POV Breakbulk records
Export 13 Add - AMMO Breakbulk records
Export 14 Add - Unacc Baggage Breakbulk records
Export 15 Add - Gov’t Vehicle Breakbulk records
Export 16 Add - Mail Breakbulk records
Export 17 Add - Classified Breakbulk records
Export 18 Add - Sensitive Breakbulk records
Export 19 Add - Controlled Breakbulk records
Export 20 Add - Hazardous Cargo Breakbulk records
Export 21 Add - Unitized/CONEX records
Export 22 Add - Empty Van records
Export 23 Add - Loaded Ro/Ro Van records
Export 23A Assign booking number to breakbulk records and run query
Export B01 Create records to test Tally, Regression, Manifest Call, Manifest Adjustment and History

Set 2-2: Perform import data loads (R3-Import-xxx on Regional)

Import 01 Create - Vessel Control Register
Import 01F Upload of floppy disk to test import tally
Import 01FF Create van with multiple commodities
Import T01 Autoload to test Import Tally and Regression

Set 2-3 Perform export status changes (R5-Export-xxx on Regional)

Export 24 Correct - Van Records by RECNO
Export 25 Correct - Van Records by TCN
Export 26 Correct - Van HHGS Records by RECNO
Export 27 Correct - HHGS Van Records by TCN
Export 28 Correct - POV Van Records by RECNO
Export 29 Correct - POV Van Records by TCN
Export 30 Correct - AMMO Van Records by RECNO
Export 31 Correct - AMMO Van Records by TCN
Export 32 Correct - Refrigerated Van Records by RECNO (add second seal)
Export 33 Correct - Refrigerated Van Records by TCN (add second seal)
Export 34 Correct - Breakbulk Records by RECNO
Export 35 Correct - Breakbulk Records by TCN
Export 36 Correct - Breakbulk Records by RECNO
Export 37 Correct - Breakbulk Records by TCN
Export 38 Correct - Breakbulk Records by RECNO
Export 39 Correct - Breakbulk Records by TCN
Export 40 Correct - Breakbulk General Cargo Records by RECNO
Export 41 Correct - Breakbulk general cargo records by TCN
Export 42 Correct - HHGS Breakbulk records by RECNO
Export 43 Correct - HHGS Breakbulk Records by TCN
Export 44 Correct - POV Breakbulk records by RECNO
Export 45 Correct - POV Breakbulk Records by TCN
Export 46 Correct - AMMO Breakbulk records by RECNO
Export 47 Correct - AMMO Breakbulk Records by TCN
Export 48 Correct - Unaccompanied Baggage Breakbulk records by RECNO
Export 49 Correct - Unaccompanied Baggage Breakbulk Records by TCN
Export 50 Correct - Government Vehicle Breakbulk Records by RECNO
Export 51 Correct - Government Vehicle Breakbulk Records by TCN
Export 52 Correct - Mail Breakbulk Records by RECNO
Export 53 Correct - Mail Breakbulk records by TCN
Export 54 Correct - Classified Breakbulk Records by RECNO
Export 55 Correct - Classified Breakbulk Records by TCN
Export 56 Correct - Sensitive Breakbulk Records by RECNO
Export 57 Correct - Sensitive Breakbulk Records by TCN
Export 58 Correct - Controlled Breakbulk Records by RECNO
Export 59 Correct - Controlled Breakbulk Records by TCN
Export 60 Correct - Hazardous Cargo Breakbulk Records by RECNO
Export 61 Correct - Hazardous Cargo Breakbulk Records by TCN
Export 62 Correct - Unitized/CONEX Records by RECNO
Export 63 Correct - Unitized/CONEX Records by TCN
Export 64 Correct - Empty Van Records by RECNO
Export 65 Correct - Empty Van records by TCN
Export 66 Correct - Loaded Ro/Ro Van by RECNO
Export 67 Correct - Loaded Ro/Ro Van by TCN
Export 68 Change - TCN by RECNO
Export 69 Change - TCN by TCN
Export 70 Delete - Records by TCN
Export 71 Delete - Records by RECNO
Export 72 Delete - Records by Container Numbers
Export 73 Mode to Lift - by RECNO
Export 74 Mode to Lift - by TCN
Export 75 Mode to Lift - by Container Number
Export 76 Change - STOW by TCN
Export 77 Change - STOW by RECNO
Export 78 SPLIT/STOW Location - by RECNO
Export 79 SPLIT/STOW Location - by TCN
Export 80 SPLIT/LIFT - by RECNO
Export 81 SPLIT/LIFT - by TCN
Export 82 MASS CORRECTION - by TCN
Export 83 MASS CORRECTION - by BVOY
Pass/Fail

Export 84  MASS CORRECTION - by VOYDOC

Set 2-4 Perform export status changes (R5-Export B-xx on Regional)

Export B02 Tally - Source stuff by RECNO
Export B03 Tally - Source stuff by TCN
Export B04 Tally - Source Stuff by container #
Export B05 Tally - Receipt by RECNO
Export B06 Tally - Receipt by TCN
Export B07 Tally - Receipt by container #
Export B08 Tally - Receipt by BVOY
Export B09 Tally - Stuff single stop van by RECNO
Export B10 Tally - Stuff single stop van by TCN
Export B11 Tally - Stuff single stop van by container #
Export B12 Tally - Stuff multi stop van by RECNO
Export B13 Tally - Stuff multi stop van by TCN
Export B14 Tally - Stuff multi stop van by container #
Export B15 Tally - Split stuff single stop van by RECNO
Export B16 Tally - Split stuff single stop van by TCN
Export B17 Tally - Split stuff single stop van by container #
Export B18 Tally - Transfer by RECNO
Export B19 Tally - Transfer by TCN
Export B20 Tally - Transfer by container #
Export B22 Tally - Lift by RECNO
Export B23 Tally - Lift by TCN
Export B24 Tally - Lift by container #
Export B26 Regress - Lifted to previous status by TCN
Export B27 Regress - Lifted to previous status by RECNO
Export B28 Regress - Lifted to previous status by container #
Export B30 Regress - Lifted to previous status by VOYDOC
Export B31 Regress - Tml stuffed contents to onhand BB by TCN
Export B32 Regress - Tml stuffed contents to onhand BB by RECNO
Export B33 Regress - Tml stuffed contents to onhand BB by container #
Export B34 Regress - Received to previous status by TCN
Export B35 Regress - Received to previous status by RECNO
Export B36 Regress - Received to previous status by container #
Export B38 Regress - Deleted to previous status by TCN
Export B39 Regress - Deleted to previous status by RECNO
Export B40 Regress - Deleted to previous status by container #
Export B42 Regress - Deleted to previous status by VOYDOC
Export B43 Manifest Export Cargo Records
Export B44 Adjust Manifested Export Cargo Records/Deletions, Corrections and Call Manifest Adjustments By TCN, RECNO or CNTNR
Export B45 Inactivate Export Vessel

Set 2-5 Perform import status changes (R5-Import-xxx on Regional)

Import 13 Correct - by TCN
Import 14 Correct - by VSNR and POSTNO
Import 15 Correct - STOW
Import 16 Correct - TCN
Import 17 Correct - Breakbulk baggage
Import 18 Correct - Breakbulk Ammo
Import 19 Correct - Breakbulk Mail
Import 20 Correct - Breakbulk HHG
Import 21 Correct - Breakbulk HazMat
Import 22 Correct - Breakbulk POV
Import 23 Correct - Breakbulk Government vehicle
Import 24 Correct - HHG van
Import 25 Correct - Baggage van
Import 26 Correct - Ammo van
Import 27 Correct - Mail van
Import 28 Correct - HazMat van
Import 29 Correct - POV van
Import 30 Correct - Government vehicle van
Import 30a Correct - Empty Van by TCN
Import 31 Stuff - Baggage in a van by TCN
Import 32 Stuff - Ammo in a van by TCN
Import 33 Stuff - Mail in a van by TCN
Import 34 Stuff - HHG in a van by TCN
Import 35 Stuff - HazMat in a van by TCN
Import 36 Stuff - POV in a van by TCN
Import 37 Stuff - Govn't vehicle in a van by TCN
Import 38 Correct - Baggage contents by TCN
Import 39 Correct - Ammo contents by TCN
Import 40 Correct - Mail contents by TCN
Import 41 Correct - HHG contents by TCN
Import 42 Correct - HazMat contents by TCN
Import 43 Correct - POV by TCN
Import 44 Correct - Govn't veh contents by TCN
Import 45 Correct - Van prime w content by TCN
Import 46 Correct - Van prime w content by POSTNO
Import 47 Correct - Baggage contents by POSTNO
Import 48 Correct - Ammo contents by POSTNO
Import 49 Correct - Mail contents by POSTNO
Import 50 Correct - HHG contents by POSTNO
Import 51 Correct - HazMat contents by POSTNO
Import 52 Correct - POV contents by POSTNO
Import 53 Correct - Govn't veh content by POSTNO
Import 54 Mass Change - By TCN
Import 55 Delete - Van by TCN
Import 56 Delete - Breakbulk by TCN
Import 57 Delete - Van with contents by TCN
Import 58 Delete - Records by range
Import 59 Delete - Record by container #
Import 60 Delete - Record by POSTNO
Import 61 Regress - Record by POSTNO
Import 62 Regress - Record by container #
Import 63 Regress - Van by TCN
Import 64 Regress - Breakbulk by TCN
**Import 65** Regress - Van with contents by TCN  
**Import 66** Regress - By POSTNO range  
**Import 67** Delete - By mass  
**Import 68** Regress - By mass  
**Import 69** Add Van with stop-offs and Contents  
**Import 70** Mass/Other Changes - By TCN  
**Import 71** Mass Correction by TCN  
**Import 72** Mass/Other Changes by VSNR & POSTNO  
**Import 75** TCN Change by TCN  
**Import 76** STOW Change by TCN  
**Import 77** Add contents to Unitized/CONEX  
**Import 78** Add additional contents Unitized/CONEX  
**Import 79** Correct contents Unitized/CONEX by TCN  
**Import 80** Correct contents in Unitized/CONEX by VSNR & POSTNO  
**Import 81** Add contents to a Loaded Ro/Ro by TCN  
**Import 82** Correct Contents in Loaded Ro/Ro by TCN  
**Import 83** Correct Contents in Loaded Ro/Ro by VSNR & POSTNO  

**Set 2-6** Perform import status changes (R5-Import-T-xx on Regional)  
**Import T-02** Review IQ Reports  
**Import T-03** Tally/Discharge - Container # & TCN  
**Import T-03a** Transfer & Regress - Container # & TCN  
**Import T-04** Tally/Discharge - By Single Postno  
**Import T-04a** Transfer and Regress - By Single POSTNO  
**Import T-05** Tally/Discharge - By Postno Range  
**Import T-05a** Transfer and Regress - By Postno Range  
**Import T-06** Tally/Discharge - By Consignee  
**Import T-06a** Transfer by Consignee - Regress by Mass  
**Import T-07** Tally/Discharge - By VSNR  
**Import T-07a** Transfer and Regress - By Mass  
**Import T-08** Tally/Discharge to Mode & Regress - By Container # & TCN  
**Import T-09** Tally/Discharge to Mode & Regress - By Single Postno  
**Import T-10** Tally/Discharge to Mode & Regress - By Postno Range  
**Import T-11** Tally/Discharge to Mode by Consignee Regress by Mass  
**Import T-12** Tally/Discharge to Mode by VSNR - Regress by Mass  
**Import T-13** Tally/Discharge - By VSNR  
**Import T-14** Tally/Disposition - By Container # and TCN  
**Import T-14a** Regress - By Container # and TCN  
**Import T-15** Tally/Disposition - By Single Postno  
**Import T-15a** Regress - By Single Postno  
**Import T-16** Tally/Disposition - By Postno Range  
**Import T-16a** Regress - By Postno Range  
**Import T-17** Tally/Disposition - By Consignee  
**Import T-17a** Regress - By Mass  
**Import T-18** Tally/Disposition - By VSNR  
**Import T-18a** Regress - By Mass  
**Import T-19** Unstuff Container - by single post number  
**Import T-20** Unstuff Container - by TCN  
**Import T-21** Unstuff Container - by container #
Import T-22 Unstuff Container - by Post number range
Import T-23 Unstuff Contents - by single post number
Import T-24 Unstuff Contents - by TCN
Import T-25 Split Disposition - change TCN and split disposition by single post number
Import T-26 Unstuff Contents - by post number ranges

Set 2-7 Perform WPS export autoload from diskette (R2-Export 85-Reg)
   Export 85  Autoload from Floppy

Set 2-8 Perform Interterminal transfer (R2-Export-xxx)
   Export 87  Interterminal Transfer - by RECNO
   Export 88  Interterminal Transfer - by TCN
   Export 89  Interterminal Transfer - by Container Number

Set 2-9 Add POV records (R2-Export-xxx on Regional)
   Export 91  Add - POV
   Export 92  Add - Advance POV
   Export 93  Add - POV Van Prime

Set 2-10 Change POV records (R5-Export-xxx on Regional)
   Export 94  Change - TCN by RECNO
   Export 95  Change - TCN by TCN
   Export 96  Change - STOW by RECNO
   Export 97  Change - STOW by TCN
   Export 98  Delete - by TCN
   Export 99  Delete - by RECNO
   Export 100 Regress - by TCN
   Export 101 Regress - by RECNO

Set 2-11 Automatic Purge (R5-TML-Exp-001 on Regional)
   TML-Exp-001  Automatic purge on terminal system

Set 2-12 Flat File Transmittals
   R1-flatfiles-to-WPS  Transmittal of flat files (booking files and contractor pay)
                      from Area Command to WPS terminal

Set 2-13 Flat File Transmittals
   R1-fmsfiles-from-WPS  Transmittal of flat files (FMS files) through Hub to FMS

Set 2-14 Flat File Transmittals
   R1-atcmds-from-WPS-to-recipients  Transmittal of flat files (ATCMDS) through Hub to ETADs and NAOMIS

Set 2-15 History
   History-WPS  Reading from WPS History

TCR List by Test Set 15  August 3, 1995
APPENDIX B

LIST OF TECHNICAL TCRS PREPARED BY ORNL TO SUPPORT FUNCTIONAL TCR TESTING
**TECHNICAL TCRs**

**PREPARED FOR TESTING THE WPS CONUS REGIONAL DATABASE**

*Technical TCRs to support "Receive Data" test requirements*

R1-dataload-BKG1  
To load booking data prior to batch-loading ATCMDs

R1-dataload-BKG2  
To load booking data after batch-load of ATCMDs

R1-dataload-ATCMD  
To load ATCMD/ASPUR data

R1-dataload-ATCMD-2  
To load ATCMD data to check correction of rejected atcmd records and invalid TACs

R1-dataload-arejrecords  
To load records that will be rejected during preprocessing

R1-tech-areject  
To check for rejected ATCMD/ASPUR records (formerly R1-dataload-arejrecords)

R1-dataload-unit  
To load unit move data with "A" in first position of TCN

R1-dataload-correct  
To load data to change atcmds (add/delete contents, change LWH, change TAC)

R1-dataload-shipeff  
To load data for checking all 39 errors on the TCMD Daily Error Report

R2-load-exp01-VSL-REG  
To load vessel register data from the WPS xvoydoc table

R3-dataload-IMPORT-MAN  
To load import manifest data

R3-dataload-IMPORT-MAN-2  
To load import manifest data to check correction of rejected records

R3-dataload-IMPORT-MAN-3  
To load import manifest data to check correction of rejected records

R3-dataload-mrejrecords  
To load records that will be rejected during preprocessing

R3-tech-mreject  
To check for rejected import manifest records (formerly R3-dataload-mrejrecords)

R3-load-imp01-VSL-REG  
To load data from the WPS voydoc table

R4-tech-expmandist  
To check export manifest distribution processes

R5-dataload-ACI  
To load ACI data

R6-dataload-VSL-REGIST  
To accept the vessel register from METS and send it to WPS

R6-dataload-TTU  
To load TTU data from OCONUS sites

R6-tech-voy4  
To test logic for updating discharge dates from screen

R6-tech-disch-dts  
To ensure that manifest records exist which outstanding discharge dates

*Technical TCRs to support the "Transmit Data" test requirements*

T1-tech-datax1  
To ensure that data files are generated, transmitted, and moved to a storage directory

T1-tech-datax3  
To test resend capability for specific data file

T1-tech-datax6  
To ensure that CDCP data files are generated, transmitted, and moved to a storage directory

T2-tech24a  
To test for resend/divert entire manifest

T2-tech24b  
To check that individual manifest records were resent or diverted

T2-tech-portdodaac  
To check transfer when consignee = dodaac of a port

T3-tech-gtn1  
To ensure that GTN data files are generated, transmitted, and moved to a storage directory

T3-tech-gtn4  
To check changed frequency for GTN

T3-tech-gtn3  
To test resend capability for specific GTN data file(s)

T6-tech118  
To check that individual atcmd records were resent or diverted

T6-tech-rejects  
To check records sent from ICDB that are rejected by WPS

TCRs for WPS Regional Database 1

August 3, 1995
Technical TCRs to support "General Requirements" test requirements

<table>
<thead>
<tr>
<th>TCR</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G4-tech-112a1</td>
<td>To check screen corrections of rejected ATCMDs</td>
</tr>
<tr>
<td>G4-tech-112a2</td>
<td>To check screen corrections of rejected manifests</td>
</tr>
<tr>
<td>G4-tech-112a3</td>
<td>To check screen corrections of invalid TACs</td>
</tr>
<tr>
<td>G6-tech-code1-add</td>
<td>To check addition of distributed code table data</td>
</tr>
<tr>
<td>G6-tech-code1-mod</td>
<td>To check modification of distributed code table data</td>
</tr>
<tr>
<td>G6-tech-code1-del</td>
<td>To check deletion of distributed code table data</td>
</tr>
<tr>
<td>G6-tech-code2-add</td>
<td>To check addition of non-distributed code table data</td>
</tr>
<tr>
<td>G6-tech-code2-mod</td>
<td>To check modification of non-distributed code table data</td>
</tr>
<tr>
<td>G6-tech-code2-del</td>
<td>To check deletion of non-distributed code table data</td>
</tr>
<tr>
<td>GX-tech-WTL1</td>
<td>To check that, when the server is down, the data is saved on the Hub and then, when the server comes back up, the data automatically goes to the server.</td>
</tr>
<tr>
<td>GX-tech-WTL2</td>
<td>To check that, when a site connection is down, the data is transmitted via SLIP</td>
</tr>
</tbody>
</table>
APPENDIX C

DESCRIPTION OF THE TEST DATA SCHEMA

This handout was provided to the testers during all tests as Attachment 4 to their test packet. It includes a list of TCNs sorted by category and the total number of records in each set. The test data schema assisted testers in using the flat-file printout of individual records. TCRs cross-referenced this handout for record counts within each cargo type category.

March 1, 1996
Test Data Schema for WPS/WPS CONUS Regional Testing

The first 6 positions of the TCN for individual shipment unit records will be changed to enable testers to easily identify the specific cargo type and the source of data. The following is the schema for numbering:

Position
1 = Port Indicator
2 = Source of data/Container vs. Breakbulk
3-4 = Commodity Type
5 = Container Number or piece count
6 = Content Number

Port Indicator (TCN position 1)
0, 4 = Oakland (ports beginning 3xx; all ports not otherwise assigned to a termac)
1 = socal
2, 5 = Seattle (ports beginning 4xx)
3 = new orleans (ports beginning 2xx)

Source of data: Container vs. Breakbulk and batch vs. online (TCN position 2)
1 = ATCMD container batch
2 = ATCMD container online
3 = ATCMD breakbulk batch
4 = ATCMD breakbulk online
5 = import manifest container batch
6 = import manifest breakbulk batch
7 = import manifest breakbulk batch

Commodity type codes (TCN positions 3-4)
01 Ammo/explosives
02 POV
03 HHG
04 Outsize
09 Conex vehicles
10 General cargo
11 Reefer cargo
12 General cargo with stopoffs
13 Mail
14 Loaded RO/RO
15 Unaccompanied baggage
16 Classified
17 Sensitive
18 Controlled
19 Empty van
20 Reserved
21 General cargo
22 CONEX-related records
23-29 Reserved
30-31 Hooking records (with matches to batch ATCMDs)
32-33 Booking records (with matches to on-line builds)
36 Booking records (with no matches to ATCMDs)

Container number, piece count, or CONEX indicator where CONEX is not in a van (TCN position 5)
0-9 (container nbr, piece count)
A, B, C (CONEX indicator, where CONEX is not in a van)

Contents indicator (TCN position 6)
0 (container record or a breakbulk prime record)
1-9 (number of specific content record)
A, B (CONEX contained in a van)

Remainder of TCN will be filled with “X”s (except as noted, e.g., S in position 8 for unit cargo; see in positions 6-14 for HHG/POV cargo; booked voydoc in positions 7-10 for booking data sets only); also last three positions will be as given in the TCN of the original dataset.

Test Data Schema, July 7, 1995
Data Set – Booking (batch data load):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Tot. records</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booking Set 1A</td>
<td>0130008888V</td>
<td>0130908888V</td>
<td>10 vans</td>
<td>Match to batch ATCMDs, loaded before ATCMDs</td>
</tr>
<tr>
<td>(Container)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Booking Set 2A</td>
<td>0131008888V</td>
<td>0131908888V</td>
<td>10 vans</td>
<td>Match to batch ATCMDs, loaded after ATCMDs</td>
</tr>
<tr>
<td>(Container)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Booking Set 1C</td>
<td>0232008888V</td>
<td>0232908888V</td>
<td>10 vans</td>
<td>Match to ATCMDs built online, loaded before ATCMDs</td>
</tr>
<tr>
<td>(Container)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Booking Set 2B</td>
<td>0233008888V</td>
<td>0233908888V</td>
<td>10 vans</td>
<td>Match to ATCMDs built online, loaded after ATCMDs</td>
</tr>
<tr>
<td>(Container)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Booking Set 1B</td>
<td>0136008888V</td>
<td>0136908888V</td>
<td>10 vans</td>
<td>No matches to any ATCMD records</td>
</tr>
</tbody>
</table>

Total of 50 booking records loaded to database, 40 of which will be matched to ATCMDs.
## Data Set 1 — ATCMD Container (batch data load):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Act'l records loaded</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explos: Container</td>
<td>010000</td>
<td>010060</td>
<td>7 vans</td>
<td></td>
</tr>
<tr>
<td>Ammo/Explosive: Contents</td>
<td>010001</td>
<td>010061</td>
<td>15 contents</td>
<td></td>
</tr>
<tr>
<td>Hazardous: Container</td>
<td>010100</td>
<td>010190</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>Hazardous: Contents</td>
<td>010101</td>
<td>010199</td>
<td>77 contents</td>
<td>orig. 57 haz &amp; 21 gen; 1 reject (flat †)</td>
</tr>
<tr>
<td>POV: Containers</td>
<td>010200</td>
<td>010290</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>POV: Contents</td>
<td>010200(ssn)</td>
<td>010290(ssn)</td>
<td>20 contents</td>
<td>Use 2 per container</td>
</tr>
<tr>
<td>HHG: Container</td>
<td>010300</td>
<td>010390</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>HHG: Content</td>
<td>010390(ssn)</td>
<td>010390(ssn)</td>
<td>28 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>General: Container Set 1</td>
<td>011000</td>
<td>011090</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>General: Contents</td>
<td>011001</td>
<td>011099</td>
<td>14 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>General: Reefer Container</td>
<td>011100</td>
<td>011190</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>General: Reefer Contents</td>
<td>011101</td>
<td>011199</td>
<td>40 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>Loaded RO/RO</td>
<td>011400</td>
<td>011410</td>
<td>2 Ro/Ros</td>
<td></td>
</tr>
<tr>
<td>RO/RO Contents</td>
<td>011401</td>
<td>011411</td>
<td>3 contents</td>
<td></td>
</tr>
<tr>
<td>General: Empty Container</td>
<td>011900</td>
<td>011990</td>
<td>10 emp.vans</td>
<td>Actually breakbulk cargo</td>
</tr>
<tr>
<td>General: Container Set 2</td>
<td>012100</td>
<td>012190</td>
<td>9 vans</td>
<td></td>
</tr>
<tr>
<td>General: Contents</td>
<td>012101</td>
<td>012199</td>
<td>63 contents</td>
<td>Orig. 64 contents; 1 reject</td>
</tr>
<tr>
<td>Van with CONEX</td>
<td>012200</td>
<td>012200</td>
<td>1 van</td>
<td></td>
</tr>
<tr>
<td>CONEX in van</td>
<td>01220A</td>
<td>01220A</td>
<td>1 CONEX</td>
<td>CONEX in van (TCN = 012200)</td>
</tr>
<tr>
<td>Content in CONEX in van</td>
<td>012201</td>
<td>012201</td>
<td>1 content</td>
<td>Content in CONEX (TCN = 012200A in van)</td>
</tr>
<tr>
<td>CONEX not in van</td>
<td>0122A0</td>
<td>0122B0</td>
<td>2 CONEXs</td>
<td>2 CONEXs not in a van</td>
</tr>
<tr>
<td>CONEX contents</td>
<td>0122A1</td>
<td>0122B1</td>
<td>2 contents</td>
<td>2 contents in CONEXs</td>
</tr>
<tr>
<td>Booking Set 1A</td>
<td>0130008888V</td>
<td>0130908888V</td>
<td>10 vans</td>
<td>Matches to booking records</td>
</tr>
<tr>
<td>Booking Set 2A</td>
<td>0131008888V</td>
<td>0131908888V</td>
<td>10 vans</td>
<td>Matches to booking records</td>
</tr>
</tbody>
</table>

*A total of 365 ATCMD prime records (vans and contents) are actually loaded to the database. Two records from the original flat files are rejected.

†This rejected record is corrected during testing.
Data Set 2 — ATCMD Container (online build):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Tot. records</th>
<th>TCR &amp; attachment No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explos: Container</td>
<td>020000</td>
<td>020003</td>
<td>1 van</td>
<td>R1-121-EXP05</td>
</tr>
<tr>
<td>Ammo/Explosive: Contents</td>
<td>020001</td>
<td>02003</td>
<td>3 contents</td>
<td>R1-121-EXP05-C1, C2, C3</td>
</tr>
<tr>
<td>Hazardous: Container</td>
<td>020100</td>
<td>020103</td>
<td>1 van</td>
<td>R1-121-HAZ</td>
</tr>
<tr>
<td>Hazardous: Contents</td>
<td>020101</td>
<td>020103</td>
<td>3 contents</td>
<td>R1-121-HAZ-C1, C2, C3</td>
</tr>
<tr>
<td>POV: Containers</td>
<td>020200</td>
<td>020200</td>
<td>1 van</td>
<td>R1-121-EXP04</td>
</tr>
<tr>
<td>POV: Contents</td>
<td>020200(ssn)</td>
<td>020200(ssn)</td>
<td>2 contents</td>
<td>R1-121-EXP04-C1, C2</td>
</tr>
<tr>
<td>HHG: Container</td>
<td>020300</td>
<td>020300</td>
<td>1 van</td>
<td>R1-121-EXP03</td>
</tr>
<tr>
<td>HHG: Contents</td>
<td>020300(ssn)</td>
<td>020300(ssn)</td>
<td>5 contents</td>
<td>R1-121-EXP03-C1</td>
</tr>
<tr>
<td>General: Container</td>
<td>021000</td>
<td>021000</td>
<td>1 van</td>
<td>R1-121-EXP02</td>
</tr>
<tr>
<td>General: Contents</td>
<td>021001</td>
<td>021005</td>
<td>5 contents</td>
<td>R1-121-EXP02-C1</td>
</tr>
<tr>
<td>General: Reefer van</td>
<td>021100</td>
<td>021100</td>
<td>1 van</td>
<td>R1-121-EXP06 (and trailers)</td>
</tr>
<tr>
<td>General: Reefer contents</td>
<td>021101</td>
<td>021102</td>
<td>2 contents</td>
<td>R1-121-EXP06-C1, C2</td>
</tr>
<tr>
<td>General: Van with stopoffs</td>
<td>021200</td>
<td>021200</td>
<td>1 van</td>
<td>R1-121-EXP07</td>
</tr>
<tr>
<td>General: Stp van contents</td>
<td>021201</td>
<td>021202</td>
<td>2 contents</td>
<td>R1-121-EXP07-C1, C2</td>
</tr>
<tr>
<td>Booking Set 1C</td>
<td>0232008888V</td>
<td>0232008888V</td>
<td>10 vans</td>
<td>10 matches to booking: R1-122-BKG-VAN1</td>
</tr>
<tr>
<td>Booking Contents</td>
<td>0232018888V</td>
<td>0232018888V</td>
<td>10 contents</td>
<td>1 content built for each booked van</td>
</tr>
<tr>
<td>Booking Set 2B</td>
<td>0233008888V</td>
<td>0233008888V</td>
<td>10 vans</td>
<td>10 matches to booking: R1-122-BKG-VAN2</td>
</tr>
<tr>
<td>Booking Contents</td>
<td>0233018888V</td>
<td>0233018888V</td>
<td>10 contents</td>
<td>1 content built for each booked van</td>
</tr>
</tbody>
</table>

* A total of 69 ATCMDs are built online and loaded to the database.
Data Set 3 -- ATCMD Breakbulk (batch data load):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Act'l tot. records</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explosives</td>
<td>030000</td>
<td>030010</td>
<td>2 pieces</td>
<td></td>
</tr>
<tr>
<td>Hazardous</td>
<td>030100</td>
<td>030190</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>POV</td>
<td>03020(ssn)</td>
<td>03021(ssn)</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>HHG</td>
<td>030300</td>
<td>030390</td>
<td>0 pieces</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>030700XS</td>
<td>030790XS</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>Outsize</td>
<td>030800</td>
<td>030830</td>
<td>4 pieces</td>
<td></td>
</tr>
<tr>
<td>Government Vehicles</td>
<td>030900</td>
<td>030990</td>
<td>19 pieces</td>
<td>10 orig. pieces, exploded to 19; see last 3 positions of TCN for TCN beginning 030900</td>
</tr>
</tbody>
</table>

*A total of 55 ATCMDs are loaded to the database.

Data Set 4 -- ATCMD Breakbulk (online build):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Act'l tot. records</th>
<th>TCR &amp; attachment: No.; comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explosives</td>
<td>040000</td>
<td>040020</td>
<td>3 pieces</td>
<td>R1-121-EXP12</td>
</tr>
<tr>
<td>Hazardous</td>
<td>040100</td>
<td>040120</td>
<td>3 pieces</td>
<td>R1-121-EXP19</td>
</tr>
<tr>
<td>POV</td>
<td>04020(ssn)</td>
<td>04022(ssn)</td>
<td>3 pieces</td>
<td>R1-121-EXP11</td>
</tr>
<tr>
<td>HHG</td>
<td>04030(ssn)</td>
<td>04032(ssn)</td>
<td>3 pieces</td>
<td>R1-121-EXP10</td>
</tr>
<tr>
<td>Outsize</td>
<td>040800</td>
<td>040820</td>
<td>3 pieces</td>
<td>R1-121-EXP14A</td>
</tr>
<tr>
<td>Government Vehicles</td>
<td>040900</td>
<td>040920</td>
<td>3 pieces</td>
<td>R1-121-EXP14</td>
</tr>
<tr>
<td>General BB Cargo</td>
<td>041000</td>
<td>041020</td>
<td>3 pieces</td>
<td>R1-121-EXP08</td>
</tr>
<tr>
<td>Mail</td>
<td>041300</td>
<td>041320</td>
<td>3 pieces</td>
<td>R1-121-EXP15</td>
</tr>
<tr>
<td>Unaccomp'd Baggage</td>
<td>04150(ssn)</td>
<td>04152(ssn)</td>
<td>3 pieces</td>
<td>R1-121-EXP13</td>
</tr>
<tr>
<td>Classified</td>
<td>041600</td>
<td>041620</td>
<td>3 pieces</td>
<td>R1-121-EXP16</td>
</tr>
<tr>
<td>Sensitive</td>
<td>041700</td>
<td>041720</td>
<td>3 pieces</td>
<td>R1-121-EXP17</td>
</tr>
<tr>
<td>Controlled</td>
<td>041800</td>
<td>041820</td>
<td>3 pieces</td>
<td>R1-121-EXP18</td>
</tr>
<tr>
<td>Empty Van</td>
<td>041900</td>
<td>041920</td>
<td>3 pieces</td>
<td>R1-121-EXP21</td>
</tr>
</tbody>
</table>

*A total of 42 ATCMDs are built online and loaded to the database.
### Data Set 5 — Import Manifest Containers (batch data load):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Actual records loaded</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explosive: Container</td>
<td>050000</td>
<td>050090</td>
<td>7 vans</td>
<td></td>
</tr>
<tr>
<td>Ammo/Explosive: Contents</td>
<td>050001</td>
<td>050061</td>
<td>15 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>Hazardous: Container</td>
<td>050100</td>
<td>050190</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>Hazardous: Contents</td>
<td>050101</td>
<td>050199</td>
<td>77 contents</td>
<td>orig. 57 haz + 21 gen; 1 reject</td>
</tr>
<tr>
<td>POV: Containers</td>
<td>050200</td>
<td>050290</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>POV: Contents</td>
<td>05020(ssn)</td>
<td>05029(ssn)</td>
<td>20 contents</td>
<td>Usu 2 per container</td>
</tr>
<tr>
<td>HHG: Container</td>
<td>050300</td>
<td>050390</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>HHG: Contents</td>
<td>05030(ssn)</td>
<td>05039(ssn)</td>
<td>34 contents</td>
<td>26 HHG and 8 general</td>
</tr>
<tr>
<td>General: Container Set 1</td>
<td>051000</td>
<td>051090</td>
<td>10 vans</td>
<td></td>
</tr>
<tr>
<td>General: Contents</td>
<td>051001</td>
<td>051099</td>
<td>10 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>General: Reefer Container</td>
<td>051100</td>
<td>051190</td>
<td>10 vans</td>
<td>2 of these are reefer RO/ROs</td>
</tr>
<tr>
<td>General: Reefer Contents</td>
<td>051101</td>
<td>051199</td>
<td>28 contents</td>
<td>Max of 9 per container</td>
</tr>
<tr>
<td>Loaded RO/RO</td>
<td>051400</td>
<td>051410</td>
<td>2 Ro/ROs</td>
<td></td>
</tr>
<tr>
<td>RO/RO Contents</td>
<td>051401</td>
<td>051411</td>
<td>3 contents</td>
<td></td>
</tr>
<tr>
<td>General: Empty Container</td>
<td>051900</td>
<td>051990</td>
<td>10 vans</td>
<td>Actually considered breakbulk</td>
</tr>
<tr>
<td>General: Container Set 2</td>
<td>052100</td>
<td>052180</td>
<td>9 vans</td>
<td></td>
</tr>
<tr>
<td>General: Contents</td>
<td>052101</td>
<td>052189</td>
<td>9 contents</td>
<td></td>
</tr>
<tr>
<td>Van with CONEX</td>
<td>052200</td>
<td>052210</td>
<td>1 van</td>
<td></td>
</tr>
<tr>
<td>CONEX in van</td>
<td>05220A</td>
<td>05220A</td>
<td>1 CONEX</td>
<td>CONEX in van (TCN = 052200)</td>
</tr>
<tr>
<td>Content in CONEX</td>
<td>052201</td>
<td>052201</td>
<td>1 content</td>
<td>Content in CONEX (TCN = 052200) in van</td>
</tr>
<tr>
<td>CONEX not in van</td>
<td>0522A0</td>
<td>0522B0</td>
<td>2 CONEXs</td>
<td>CONEXs not in van</td>
</tr>
<tr>
<td>CONEX contents</td>
<td>0522A1</td>
<td>0522B1</td>
<td>2 contents</td>
<td>Contents in CONEX</td>
</tr>
</tbody>
</table>

*A total of 281 actual cargo records loaded to the database.
†This rejected record is corrected during testing.
Data Set 7 - Import Manifest Breakbulk (batch data load):

<table>
<thead>
<tr>
<th>Cargo type category</th>
<th>TCN beg. No.</th>
<th>TCN end. No.</th>
<th>Act'l tot. records</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ammo/Explosives</td>
<td>070000</td>
<td>070010</td>
<td>2 pieces</td>
<td></td>
</tr>
<tr>
<td>Hazardous</td>
<td>070100</td>
<td>070190</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>POV</td>
<td>07020(ssn)</td>
<td>07029(ssn)</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>HHG</td>
<td>07030(ssn)</td>
<td>07039(ssn)</td>
<td>0 pieces</td>
<td></td>
</tr>
<tr>
<td>Unit</td>
<td>070700XS</td>
<td>070790XS</td>
<td>10 pieces</td>
<td></td>
</tr>
<tr>
<td>Outsize</td>
<td>070800</td>
<td>070830</td>
<td>4 pieces</td>
<td></td>
</tr>
<tr>
<td>Government Vehicles</td>
<td>070900</td>
<td>070990</td>
<td>10 pieces</td>
<td></td>
</tr>
</tbody>
</table>

A total of 46 actual cargo records are loaded to the database.
APPENDIX D

A LIST OF HANDOUTS OF
FLAT FILE LAYOUTS OF DATA LOADED VIA BATCH INPUT

This handout was provided to the testers during all tests. It provided a list to the testers of all of the flat-file printouts they were receiving. Attachments 7A-7E were printouts of individual records that matched the criteria described in Appendix C of this document.

Attachment 7A: ATCMD Containers and Breakbulk --PRIME DATA ONLY. These are the data sets defined in Attachment 4 as Data Sets 1 (container batch input) and 3 (breakbulk batch input).

Attachment 7B: ATCMD Containers and Breakbulk -- PRIMES AND TRAILERS. These are the data sets defined in Attachment 4 as Data Sets 1 (container batch input) and 3 (breakbulk batch input).

Attachment 7C-1: BOOKING DATA. These are the data sets defined in Attachment 4 as Booking Sets 1A, 1B, and 1C.

Attachment 7C-2: BOOKING DATA. These are the data sets defined in Attachment 4 as Booking Sets 2A and 2B.

Attachment 7D: Import Manifest Containers and Breakbulk --PRIME DATA ONLY. These are the data sets defined in Attachment 4 as Data Sets 5 and 7.

Attachment 7E: Import Manifest Containers and Breakbulk -- PRIMES AND TRAILERS. These are the data sets defined in Attachment 4 as Data Sets 5 and 7.

Attachment 7F: ACI Data

Attachment 7G: Vessel Register Data

Attachment 7H: Discharge and Disposition Data (TTU Records) from OCONUS

Attachment 7I: Unit Move Records for Army, with an "A" in the first position of the TCN (10 records).

Attachment 7J: ATCMD batch changes/corrections (add/delete content, change LWH, change TAC) to previously submitted records.

Attachment 7K: Data for testing the TCMD Effectiveness Report

Attachment 7L: Duplicate Records, testing reject processing.
APPENDIX E

TEST ORDER

This handout was provided to the test leaders to assist in maintaining control over the order of the testing.
### TEST ORDER FOR TCRS (WPS Regional Database)

**Phase 1: Records Originating at the Regional Database and Passed to WPS via One Hub**

*Note: these tasks may be run concurrently with Phase 2 tasks*

<table>
<thead>
<tr>
<th>Approval Date</th>
<th>Regional Technical Tasks</th>
<th>Regional Functional Tasks</th>
<th>WPS Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>THIS SECTION TESTS PROCESSING OF ATCMD DATA FROM REGIONAL TO WPS SITES (SDR, 3DR, THROUGH WACK)</strong></td>
<td><strong>1-1 Test booking data load (R1-113-BKG-1, -2, -3)</strong></td>
<td>Load METS vessel register</td>
</tr>
<tr>
<td></td>
<td>Load 1st set of booking data (R1-dataload-BKG1)</td>
<td>1-2 Test matchup of booking and ATCMD data (R1-113-BKG-4, -5)</td>
<td>WPS &quot;follow-on&quot; TCRs to R1-121-EXP02 thru R1-121-EXP15 (note: first TCR contains manual autoload)</td>
</tr>
<tr>
<td></td>
<td>Load vessel register from METS (R6-dataload-VSL-REGIST)</td>
<td>1-3 Build ATCMDs on-line (R1-121-EXP02 thru R1-121-EXP15)</td>
<td>WPS &quot;follow-on&quot; TCRs to R1-113-atcmd-xxx and R1-117 (R1-atcmd-xxx)</td>
</tr>
<tr>
<td></td>
<td>Load ATCMDs (R1-dataload-ATCMD)</td>
<td>1-4 Remaining TCRs to test load of ATCMD data (all R1-121-atcmd-xxx and R1-117)</td>
<td>Allow nightly autoload to load these ATCMDs and check for receipt on WPS; WPS &quot;follow-on&quot; TCRs to R1-121-EXP16 thru R1-121-refuse</td>
</tr>
<tr>
<td></td>
<td>Load set of Army unit move data (R1-dataload-unit)</td>
<td>1-5 Build remaining ATCMDs on-line (R1-121-EXP16 thru R1-122-refuse)</td>
<td>WPS follow-on TCRs to T6-118xxx (T6-118-WPS; note: TCR contains manual autoload)</td>
</tr>
<tr>
<td></td>
<td>Load 2nd set of booking data (R1-dataload-BKG2)</td>
<td>1-6 Test matchup of booking and ATCMD data (R1-113-BKG-6, -7, -8)</td>
<td>Print and reprint ACI data and enter data into WPS</td>
</tr>
<tr>
<td></td>
<td>Check for resends/diverted ATCMDs on WPS work tables (T6-tech118)</td>
<td>1-7 Resend/Divert ATCMDs (T6-118a1, a3, b1, b2's, b3)</td>
<td>Print and reprint ACI data and enter data into WPS</td>
</tr>
<tr>
<td></td>
<td>Load ACI data (R5-dataload-ACI)</td>
<td>Load batch correction records (R1-dataload-correct)</td>
<td></td>
</tr>
</tbody>
</table>

**Test Order for TCRs 1 August 3, 1995**
| Load batch set of records for testing reject processing (R1-dataload-arejrecords) | 1-8 Correct rejected ATCMD record (G4-112a1) |
| Check ATCMD reject list (R1-tech-arej) | 1-9 Correct invalid TACs (G4-112a3) |
| Load dataset to initiate automated correction processes (R1-dataload-ATCMD-2); check correction of rejected ATCMD (G4-tech-112a1) | 1-10 Process batch corrections, on-line ATCMD corrections, and on-line TAC corrections on WPS (G4-112-WPS - note TCR contains manual autoload) |
| Check correction of invalid TACs (G4-tech-112a3) | THIS SECTION TESTS PROCESSING OF IMPORT MANIFEST DATA FROM REGIONAL TO WPS SITES (3DK, 4DK) THROUGH WAXX |
| Load import manifests (R3-dataload-IMPORT-MAN and R3-dataload-IMPORT-MAN-2) | |
| Load data for testing manifest reject processing (R3-dataload-mrejrecords) | 1-22 Test load of import manifest data (all R3-21-import-xxx) |
| | WPS "follow-on" TCRs to R3-21-import-xxx (note: first TCR contains manual autoload) |
| Check for resent/diverted manifests on WPS work tables (T2-tech24a and 24b) | 1-23 Resend and divert manifests after receipt of documentation; resend and divert by entr nbr; resend and divert by TCN (all T2-24ax, bx, and cx) |
| Check manifest reject list (R3-dataload-mrej) | WPS follow-on TCRs to all T2-24's (note: first TCR contains manual autoload for 4DS) |
| Load data to initiate automated correction processing (R3-dataload-IMPORT-MAN-3); check correction of rejected manifest record (G4-tech-112a2) | 1-24 Correct rejected manifest record (G4-112a2) |

Test Order for TCRs

Test Order for TCRs 2 August 3, 1995
<table>
<thead>
<tr>
<th>Test Order for TCRs</th>
<th>August 3, 1995</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-30 Test all intranet visibility requirements (all G1-xxx)</td>
<td>1-70 WPS autoloading of data sets with multiple data conditions (GTR-01)</td>
</tr>
<tr>
<td>Check data extracts for GTN (T3-tech-gtn1)</td>
<td>1-71 WPS performs tally transaction on selected records and vessels (Import tally transactions-01 - 03 and Export tally transactions-01)</td>
</tr>
<tr>
<td>Check non-GTN data extracts (T1-tech-datax1, 6)</td>
<td></td>
</tr>
<tr>
<td>1-51 Resend GTN files; change frequency of transmittal for GTN files (T1-gtn3, 4)</td>
<td></td>
</tr>
<tr>
<td>Check resent GTN and non-GTN files (T3-tech-gtn3 and T3-tech-gtn4; T1-tech-datax3)</td>
<td>1-52 Resend non-GTN files (T1-datax3)</td>
</tr>
<tr>
<td>1-51A Ensure that GTN frequency is set to 6 hours after testing is complete (T3-gtn4a)</td>
<td></td>
</tr>
<tr>
<td>Load dataset for testing ATCMD shipper effectiveness conditions (R1-dataload-shipoff)</td>
<td>1-53 Test reports production (G5-xxx)</td>
</tr>
<tr>
<td>1-54 Test code table maintenance and distribution (all G6-xxx-add); note: do only the ones to add a code here</td>
<td>WPS &quot;follow-on&quot; TCR (G6-add-WPS)</td>
</tr>
<tr>
<td>Check for code table distribution on WPS work tables (G6-tech-code1-add and G6-tech-code2-add)</td>
<td>1-55 Test code table maintenance and distribution (all G6-xxx-mod); note: do only the ones to modify a code here</td>
</tr>
<tr>
<td>Task</td>
<td>Code Table Distribution on WPS Work tables (G6-tech-code1-mod and G6-tech-code2-mod)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Check for code table distribution on WPS work tables (G6-tech-code1-del and G6-tech-code2-del)</td>
<td>1-55 Test code table maintenance and distribution (all G6-xxx-del); note: do only the ones to delete a code here</td>
</tr>
<tr>
<td>Ensure that outstanding discharge dates are available for updating (R6-tech-disch-dts)</td>
<td>1-57 Reviewing outstanding discharge dates (R6-disch-dts)</td>
</tr>
<tr>
<td>Monitor functional process for updating discharge dates (R6-tech-voy4)</td>
<td>1-57a Entering/checking discharge dates (R6-voy4)</td>
</tr>
<tr>
<td>Load of discharge dates via TTU (R6-dataload-TTU)</td>
<td>1-58 Checking discharge dates updated via TTU process (R4-voy5)</td>
</tr>
<tr>
<td>Check records that were rejected by WPS (T6-tech-rejects)</td>
<td>1-59 Utilities for printing unix and IQ files and saving to a disk (G6-util-xxx)</td>
</tr>
<tr>
<td>Check export manifest distribution processes (R4-tech-expmandist)</td>
<td>1-60 Export Manifest dist. processes (Reg-G-mfst-001)</td>
</tr>
<tr>
<td>1-61 Export Manifest print process (Reg-G-mfst-002)</td>
<td>1-62 Export manifest distribution table preparation (Reg-G-mfst-003)</td>
</tr>
<tr>
<td>1-63 IQ (RG-IQ-001)</td>
<td>1-64 Port-to-port processing (Reg-G-Port-to-Port)</td>
</tr>
</tbody>
</table>

Test Order for TCRs August 3, 1995
**PHASE 2: RECORDS ORIGINATING AT WPS AND PASSED TO THE REGIONAL DATABASE VIA ONE HUB**

*Note: these tasks may be run concurrently with Phase 1 tasks*

<table>
<thead>
<tr>
<th>Approval Date</th>
<th>Regional Technical Tasks</th>
<th>Regional Functional Tasks</th>
<th>WPS Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>All req's related to receiving WPS ATCMD data (all R2-Export-xxx)</td>
<td>2-1 Perform all export data loads (Nita's and Kitty's data entry -- Export 01 - Export 23 and Export B01)</td>
</tr>
<tr>
<td></td>
<td>Test transfer of voyage data (R2-load-EXP01-VSL-REG)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test transfer of voyage data (R3-load-IMP01-VSL-REG)</td>
<td>All req's related to receiving WPS import-manifest-loaded-at-port data (all R3-Import-xxx)</td>
<td>2-2 Perform all import data loads (Georgia and Rod's data entry -- Import 01 - Import 12 and Import T01)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All req's related to receiving WPS status changes (all R5-Export-24-Reg - R5-Export-84-Reg)</td>
<td>2-3 Perform export status changes (Export 24 - Export 84)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-4 Perform export status changes (Export B02 - Export B45)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2-5 Perform import status changes (Import 13 - Import 83)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>All req's related to receiving WPS status changes (R5-Import T-02-Reg - R5-Import T-26-Reg)</td>
<td>2-6 Perform import status changes (Import T-02 - Import T-26)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Test Order for TCRs*  
*August 3, 1995*
<table>
<thead>
<tr>
<th>Test Order for TCRs</th>
<th>6</th>
<th>August 3, 1995</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Req's Related to Receiving WPS Data (R2-Export 85-Reg)</th>
<th>2-7 Perform WPS export autoload from diskette (Export 85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Receiving Interterminal Transfer (R2-Export-87-Reg - R2-Export-89-Reg)</td>
<td>2-8 Perform Interterminal transfer (Export 87 - Export 89)</td>
</tr>
<tr>
<td>Receive new POV records (R2-Export 91-Reg - R2-Export-93-Reg)</td>
<td>2-9 Add POV records (Export 91 - Export 93)</td>
</tr>
<tr>
<td>Receive changes to POV records (R5-Export 94-Reg - R5-Export-101-Reg)</td>
<td>2-10 Change POV records (Export 94 - Export 101)</td>
</tr>
<tr>
<td>Follow-on TCRs to automatic purge (TML-Exp-001-Reg)</td>
<td>2-11 Automatic purge (TML-EXP-001)</td>
</tr>
<tr>
<td>Flat file transmittals of booking files and contractor pay to WPS (Bob Watts to coordinate)</td>
<td>2-12 Flat file transmittals of booking files and contractor pay to WPS (Bob Watts to coordinate)</td>
</tr>
<tr>
<td>Flat file transmittals of FMS files from WPS thru Hub (Bob Watts to coordinate)</td>
<td>2-13 Flat file transmittals of FMS files from WPS thru Hub (Bob Watts to coordinate)</td>
</tr>
<tr>
<td>Flat file transmittals of ATCMDs to ETADs and NAOMIS (Bob Watts to coordinate)</td>
<td>2-14 Flat file transmittals of ATCMDs to ETADs and NAOMIS (Bob Watts to coordinate)</td>
</tr>
<tr>
<td>Accessing records in WPS History</td>
<td>2-15 Accessing records in WPS History</td>
</tr>
</tbody>
</table>
APPENDIX F

FORMS THAT WERE USED DURING MAISRC TESTING OF ICDB

Figure F.1 DA Form 5005-R. Engineering Change Proposal — Software. This form was used for writing up problems that were identified during testing. Whoever identified the problem described it in sufficient detail that the developers could then assign priority, responsibility, and a recommended solution.

Figure F.2 SQT - WPS Regional Code Upload Log. This form was used to keep track of the status of code uploads to correct problem reports. It was constantly updated, sometimes multiple times a day. This form was developed and maintained by ORNL.
**ENGINEERING CHANGE PROPOSAL—SOFTWARE (ECP-S)**

For use of this form, see AR 25-2; the present agency is DODCSA

<table>
<thead>
<tr>
<th>1. TO:</th>
<th>2. FROM:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. ORIGINATOR NUMBER</th>
<th>4. POINT OF CONTACT (Name and telephone no.)</th>
<th>5. PRIORITY (Check one of ECP-S)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>☐ EMERGENCY ☐ URGENT ☐ ROUTINE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. APPLICATION/BASELINE/VERSION</th>
<th>7. EXECUTIVE SW BASELINE/VERSION</th>
<th>8. PROBLEM DATE (YY/MM/DD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>9. JOB/FUNCTION/PROGRAM(0)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. TITLE OF PROBLEM/CHANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>11. DESCRIPTION OF PROBLEM/CHANGE (List all attachments and referenced statements) (If additional space is needed, use form 15. Remarks)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>12. EFFECT ON USER (If additional space is needed, use form 15. Remarks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>13. RECOMMENDED SOLUTION/JUSTIFICATION (If additional space is needed, use form 15. Remarks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>14. DATE (YY/MM/DD)</th>
<th>NAME AND TITLE OF SUBMITTING AUTHORITY</th>
<th>SIGNATURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DA FORM 5005-R, NOV 81

REPLACES DA FORM 4167-R, 1 FEB 74, WHICH IS OBSOLETE.
16. MACOM (Check one and include any comments)
   □ APPROVE
   □ DISAPPROVE

17. DATE (MMDD)

18. NAME AND TITLE

19. SIGNATURE

20. DATE (MMDD) NAME AND TITLE

21. SIGNATURE

22. USER/MACOM ACTION (ECP-8 Only)

23. ASSIGNED RESPONSIBLE AGENCY (Problem Report Only)

24. PROBLEM REPORT ACTION TAKEN (Check one)
   □ DUPLICATE OF EXISTING ECP: NO.
   □ RESOLVED BY CUSTOMER ASSISTANCE
   □ IDENTIFIED AS URGENT OR ROUTINE
   □ EMERGENCY ECP FORMALIZED
   □ CANCELED BY ORIGINATOR
   □ CANCELED FOR INSUFFICIENT IDENTIFICATION
   □ CANCELED FOR INSUFFICIENT DOCUMENTATION

25. DATE (MMDD)

26. NAME AND TITLE

27. SIGNATURE

28. PROPONENT AGENCY AND/or ASSIGNED RESPONSIBLE AGENCY (ECP-8 Only)

29. CLASS OF ECP (Check one)
   □ I
   □ II
   □ III

30. ECP TYPE (Check one)
   □ PRELIMINARY
   □ FORMAL

31. JUSTIFICATION CODE

32. ECP NUMBR

33. ESTIMATED COST/SAVINGS

34. OTHER SYSTEMS AFFECTED

35. CHANGE IDENTIFICATION (Check one in each column)
   □ FUNCTIONAL
   □ MAJOR
   □ MAINTENANCE
   □ TECHNICAL
   □ MINOR
   □ MODIFICATION

36. PROJECTED IMPLEMENTATION

37. APPROVAL AUTHORITY (Check agency and action)
   □ PROPONENT AGENCY
   □ ASSIGNED RESPONSIBLE AGENCY
   □ APPROVED
   □ DISAPPROVED

38. DATE (MMDD)

39. NAME AND TITLE

40. SIGNATURE

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