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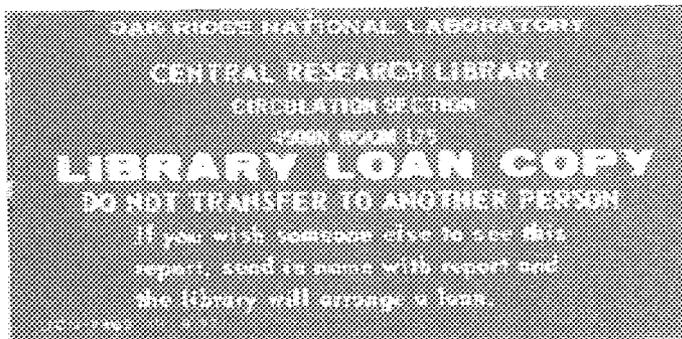
**OAK RIDGE
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MARTIN MARIETTA

Test Plan and Implementation Procedures for the Integrated Booking System Prototype (IBS-P)

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FOR THE UNITED STATES
DEPARTMENT OF ENERGY

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Energy Division

TEST PLAN AND IMPLEMENTATION PROCEDURES
FOR THE
INTEGRATED BOOKING SYSTEM PROTOTYPE (IBS-P)

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PREFACE

The Oak Ridge National Laboratory (ORNL), under contract with the Directorate of International Traffic, Military Traffic Management Command (MTMC), completed tasking to design and develop a prototype for the Integrated Booking System (IBS). The final prototype software was completed at the end of March 1991. A second task was to provide documentation on the prototype. These documents, which have been delivered to MTMC, are being produced as a series of ORNL Technical Memorandums:

- ORNL/TM-11831 Database Specifications for the Integrated Booking System Prototype (IBS-P)
- ORNL/TM-11832 Test Plan and Implementation Procedures for the Integrated Booking System Prototype (IBS-P)
- ORNL/TM-11833 User Interface Guidelines for the Integrated Booking System Prototype (IBS-P)
- ORNL/TM-11834 End-User's Handbook for the Integrated Booking System Prototype (IBS-P)

A primary purpose of these documentation deliverables is to provide a baseline for life cycle management (LCM) documentation for the target IBS, which will be developed by MTMC. All of the reports follow the format recommended by Department of Defense Standard (DOD-STD) 7835A. Documentation for any software development project is critical to the success and maintainability of the system. Because the target IBS has a rapid development and deployment schedule, these reports, which are being provided by ORNL to MTMC in both hard-copy and electronic form, will be important sources of initial LCM support for the final IBS.

This particular document contains two parts: the first part is a reproduction of the Test Plan for the IBS-P; the second part contains the IBS-P Implementation Procedures. These documents were delivered to MTMC as two separate reports.

ABSTRACT

The Test Plan for the Integrated Booking System -- Prototype (IBS-P) describes system testing procedures and schedules. It also provides a specific list of requirements specifications. The testing of the IBS-P was conducted by Headquarters, Military Traffic Management Command (HQ MTMC), and by each of the MTMC Area Commands (ACs). As a result of testing, modifications to the software were made, as appropriate, and text was added to the Functional Description of the target system. The prototype system was accepted by MTMC.

The Implementation Procedures outlined the process for installing the IBS-P at three sites: HQ MTMC, MTMC Eastern AC, and MTMC Western AC. This report is a guidebook for this installation. Implementation was successful at each of the three sites.

**TEST PLAN AND IMPLEMENTATION PROCEDURES
FOR THE
INTEGRATED BOOKING SYSTEM PROTOTYPE (IBS-P)**

**PART I
TEST PLAN**

1. GENERAL

1.1 PURPOSE OF THE TEST PLAN

This Test Plan (PT), which was prepared for the Military Traffic Management Command's (MTMC's) Integrated Booking System Prototype (IBS-P), is designed to

- provide guidance for the management and technical effort necessary throughout the test period and
- establish a comprehensive test plan and communicate the nature and extent of the tests deemed necessary to provide a basis for evaluation of the prototype system.

The primary purpose of the testing of the IBS-P is to ensure that performance objectives, operational objectives, and functional objectives of the IBS-P have been identified and tested. Testing may also reveal the need for enhancements and previously unidentified requirements that should be included as part of the target IBS. Appendix A lists specific requirements for the accomplishment of each IBS-P objective. Appendix B contains general software test and evaluation procedures.

This PT is intended for use with a prototype system. Because the purposes of a prototype differ from those of an operational system, performance and operational specifications that might be required of an operational system are not necessarily requirements for the system prototype. Requirements that apply to the target system but which are inapplicable to IBS-P are designated in Appendix A of this report with a label of "N/A" (not applicable). The requirements listing given in Appendix A should be extended, amplified, and finalized by MTMC after completion of the prototype testing for use as the requirements listing for testing the target IBS.

1.2 THE TARGET IBS AND THE IBS-P

The target IBS will be a lead execution system of the Defense Transportation System for international surface cargo in both peacetime and wartime. IBS will support traffic management within MTMC and will respond to the requirements of both commodity managers and war planners to have continual access to information about international surface cargo movement.

The prototype will conceptually define the approach for the fully developed IBS. The IBS-P verifies concepts associated with development of the full-scale IBS, verifies the feasibility of a proposed modeling solution, further defines functional concepts, and develops an understanding of full operational capability design information. The functional elements of the prototype include booking peacetime and wartime nonunit cargo and booking unit moves (exercises and contingencies). These functional elements will undergo testing. In addition, the IBS-P will help determine an appropriate database design, an effective user interface design, and technical solutions to problems. Although it is difficult to test for "appropriateness" and "effectiveness," these features will undergo testing in order to more precisely define these terms for the target IBS.

There are anticipated differences between the IBS and the IBS-P. For example, the IBS-P will operate on IBM-compatible microcomputers; however, the target IBS will not be a microcomputer-based system. Through study of the requirements for IBS-P, additional system performance and operational requirements, system architectures, and security requirements will be determined for the target IBS and reported in the IBS Functional Description (FD). Because this PT is specific to the IBS-P, these issues will not be addressed in this PT.

1.3 PROJECT REFERENCES

- Directorate of International Traffic, Military Traffic Management Command. Integrated Booking System: Mission Element Needs Statement. UNCLASSIFIED. July 1989.
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- U.S. Department of Defense. Military Standard: DOD Automated Information Systems (AIS) Documentation Standards. DOD-STD-7935A. UNCLASSIFIED. October 1988.
- U.S. Department of Defense. Military Standard: Defense System Software Development. DOD-STD-2187. UNCLASSIFIED. June 1985.
- U.S. Department of Defense. Military Standard: Defense System Software Quality Program. DOD-STD-2188. UNCLASSIFIED. April 1988.

1.4 TERMS AND ABBREVIATIONS

ACI	Automated Carrier Interface
ATCMD	Advanced Transportation Control and Movement Documents
AUEL	Automated Unit Equipment List
CDR	Critical Design Review
CFM	CONUS Freight Management System
CMB	Cargo Management Branch
CODES	Computerized Deployment System
CONUS	Continental United States
DOD	Department of Defense
DODAAC	DOD Activity Address Code
DODIC	Department of Defense Identification Codes
DOS	Disk Operating System
EGA	Enhanced Graphics Adapter
ETR	Export Traffic Release Request
FD	Functional Description
FMS	Financial Management System
FORSCOM	U.S. Army Forces Command
HQ MTMC	MTMC Headquarters in Washington D.C.
IBM	International Business Machines
IBS	Integrated Booking System
IBS-P	Integrated Booking System Prototype
JOPE	Joint Operation Planning and Execution System
LIM	Lotus/Intel/Microsoft
MAD	Master Address Directory
MOPX	Mobility Planning and Execution
MSC	Military Sealift Command
MTMC	Military Traffic Management Command
MTIN	Inland Traffic (MTMC Directorate)
N/A	Not Applicable
OCONUS	Outside the Continental United States
ORNL	Oak Ridge National Laboratory
POD	Port of Debarkation
POE	Port of Embarkation
PT	Test Plan
RAM	Random Access Memory
RDD	Required Delivery Date
STRADS	Strategic Deployment System
TACOS	The Automated Container Offering System
TC ACCIS	Transportation Coordinator's Automated Command Control Information System
UCR	Unit Cargo Release
VGA	Video Graphics Adapter
WPS	Worldwide Port System

2. DEVELOPMENT TEST ACTIVITY

2.1 STATEMENT OF PRETEST ACTIVITY

This section of the IBS-P PT provides information on testing conducted during system development. Because this system is a prototype of the target IBS, specific system requirements were identified during the prototyping activities. Broad system requirements were specified prior to prototype development, and additional system specifications were added to the testing schedule as appropriate. A listing of program and system requirements is given in Appendix A.

2.2 PRETEST ACTIVITY RESULTS

The purpose of the IBS-P is to ensure that all system requirements for full functionality have been identified prior to beginning development of the target IBS. Because prototyping is the development mode of the IBS-P, pretesting is constantly being conducted. Thus, there is no formal mechanism for pretesting.

An evaluation of the pretest results of the IBS-P by the IBS-P development team indicates that the system successfully conducts limited peacetime and wartime nonunit cargo booking operations [see the discussion in Section 3.1 on The Automated Container Offering System (TACOS)]. The IBS-P also provides booking capabilities for unit (exercises and contingencies) cargo moves.

The target IBS must fulfill all of the requirements of the IBS-P. Additional specific requirements, which are not listed in this document, should be added to the PT for the target system.

3. TEST PLAN

3.1 SYSTEM DESCRIPTION

The IBS-P is a proof-of-concept system. Although the functionality of the prototype system must be representative of the functionality of the target system, its architecture is unlike the architecture of the target system. The hardware and system software requirements for the IBS-P are listed in Section 3.3.2. Because the purpose of prototype development is to enhance development of the target system, formal testing of hardware and system software features of the IBS-P is not included in this PT.

TACOS, an artificial intelligence booking system being developed under a separate contract, will be used in the target IBS to book export nonunit shipments. TACOS programs will be incorporated within IBS and accessed when appropriate. TACOS processing will be completely transparent to the IBS user. Access of TACOS will be simulated in the IBS-P; therefore, only part of the functionality that will be provided by TACOS will be available in the IBS-P. (This is to prevent a duplication of programming effort.)

The IBS-P will provide a demonstration of automated assistance to book peacetime nonunit cargo moves that are not included within the TACOS scope of work (e.g., foreign military sales and reoffers). IBS will also book unit cargo moves (exercises and contingencies) and will provide a demonstration of booking nonunit wartime cargo movements.

Inputs to and outputs from interfacing automated systems of the proposed IBS will be simulated for the prototype. The automated systems that will be simulated are shown in Table 3.1. Constraints for these data files are listed in Section 3.3.3. Reference data files to be used by both the IBS and the IBS-P are listed in Table 3.2.

Table 3.1. Systems for which the interface will be simulated by the IBS-P^a

System name	Purpose of interface (input to/output from IBS-P)
TACOS	Movement requirements (output from IBS-P) Booked ETRR (input to IBS-P)
TC ACCIS	Movement requirements (input to IBS-P) Release forms (output from IBS-P)
MOPX ^b	Ship information (input to IBS-P)
ACI	Booking offer (output from IBS-P) Response to booking offer (input to IBS-P)
STRADS ^b	Execution data (input to IBS-P) Booking data (output from IBS-P)
CFM ^b	Movement requirements (output from IBS-P) Routing and rating information (input to IBS-P)
AUEL	Equipment listing from FORSCOM for unit moves
FMS ^c	Information used for billing (output from IBS-P)
WPS ^c	ATCMD (output from IBS-P) Terminal data (input to IBS-P)
CODES ^c	Manifest information (output from IBS-P)

^aDefinitions of the acronyms used in this table are given in Section 1.4.

^bMOPX, STRADS, and CFM have not been confirmed as interfacing systems.

^cIt is assumed that the interface with FMS, WPS, and CODES will be accomplished through a shared database environment rather than through a direct transfer of files.

The target system will need to consider many performance and operational features (e.g., efficiency and timing, portability, flexibility, system utilities, classification and security issues, and maintainability). These features are not important considerations for the prototype. Thus, they will not be tested for IBS-P. (These issues will be addressed in the FD of the target system.)

Table 3.2. Reference files that will be used by the IBS-P*

File name	Purpose of file
MAD file	DODAAC (addresses of DOD activities); an extract of this file, provided by the Area Command, was used
Geofile	Geographic location data
MSC rate tables	MSC shipping rates
Inland transit times	Time to travel from an origin to POE
Load time	Time needed to load particular types of ships
Ocean time	Time to travel a specific distance at a given nautical speed
POE-to-POD	Distance (miles) from certain POEs to certain PODs
Ports	In-the-clear port names with corresponding geocodes/water port codes
Ship characteristics file	Data on certain vessel types
Stow factor file	Stow factors by ship and cargo type
DODIC	DOD identification code file

*Definitions of the acronyms used in this table are given in Section 1.4.

Specific requirements for the IBS-P are listed in Appendix A. They are divided into performance requirements, operational requirements, and functional requirements. For the demonstration prototype, functional requirements are of primary importance.

3.2 TESTING SCHEDULE

Pretesting of the prototype, as described in Section 2 of this report, was conducted on a continuous basis during development. In addition, earlier versions of the software were delivered to MTMC for preliminary testing and identification of desired modification. Versions 0.1 and 0.2 of the IBS-P software were demonstrated to MTMC Headquarters

(HQ MTMC) and the Eastern and Western Area Commands in March 1990. Suggested changes to these early versions were incorporated into Version 0.3 of the IBS-P software, which was delivered in June 1990. Comments on Version 0.3 were incorporated into Version 0.4. Version 0.4 was demonstrated and tested in the Critical Design Review (CDR) in January and February 1991. The results of this review were incorporated, insofar as possible, into Version 1.0 of the IBS-P software. Version 1.0 was used for the Final Acceptance Testing. The testing schedule is listed in Table 3.3.

Table 3.3. Testing schedule

Version	Test dates	Results
Version 0.1	March 1990	Accepted; enhancements noted
Version 0.2	March 1990	Accepted; enhancements noted
Version 0.3	June 1990	Accepted; enhancements noted
Version 0.4	January/February 1991	Accepted; enhancements noted
Version 1.0	March 1991	Accepted; enhancements noted

The CDR was scheduled for January 9-11, 1990. In December 1990, HQ MTMC determined that a modified testing schedule would result in better and more complete test results. Therefore, rather than a single testing period at HQ MTMC, demonstrations were presented at Western Area Command (January 23-25, 1991), at Eastern Area Command (January 30-February 1, 1991), and at HQ MTMC (February 14, 1991).

This testing was appropriate for the size of the prototype system and its intended end-use (i.e., a proof-of-concept prototype not intended for use as an operational system). The primary purpose of the CDR was to ensure that the full functionality of the target IBS, the user interface, and all data inputs and outputs from interfacing systems had been identified and clearly described. The CDR served to identify other requirements that might not have been stated formally prior to this testing phase.

The second formal test was the Final Acceptance Testing, conducted by MTMC at the end of March 1991. The original agenda for this test was to repeat the testing activities conducted for the CDR and also to test "new" features not tested during the CDR (e.g., breakbulk cargo moves, system utilities, on-line help, and wartime nonunit cargo movement functionality). This testing plan was adjusted slightly following the CDR at HQ MTMC in mid-February. At that time, it was proposed that the direction of programming for the IBS-P be directed toward making the software functional for use in Operation Desert Storm for booking cargo out of Saudi Arabia. Therefore, the final testing of the IBS-P considered the additional functionality required for this operation. Although example screens for breakbulk processing, system utilities, and on-line help were provided, functionality was incomplete. This redirection of tasking was requested by HQ MTMC.

3.3 CRITICAL DESIGN REVIEW TESTING

IBS-P software was provided on floppy diskettes to HQ MTMC and to the Eastern and Western Area Commands. Instructions for loading the software were provided by Oak Ridge National Laboratory (ORNL), the software developer. A demonstration of the software was presented by ORNL at each site. Documentation was provided for users who would run the system after the development team had departed. During the demonstration testing, comments were recorded by the development team for incorporation into the prototype software, whenever feasible, and into the FD of the target system.

3.3.1 Milestones for Testing

Preparation and CDR testing were concluded within three days at each of the Area Commands and in one day at HQ MTMC. Preparation for the actual tests included ensuring the availability of necessary hardware and peripherals, loading the software programs and all reference files, and preparing test data files (Day 1). Actual testing was conducted on Days 1-3.

3.3.2 Equipment Requirements

To install and run the IBS-P software, the following system hardware, software, and peripherals are required:

- an IBM-compatible 286 or 386 personal computer,
- at least 2 megabytes of random access memory (RAM),
- a Microsoft-compatible mouse with driver loaded,
- an EGA or VGA graphics card with appropriate color monitor,
- at least 40 megabytes of free disk space,
- MS-DOS or PC-DOS version 3.3 (or higher), and
- one floppy diskette drive (high-density drive preferred).

When expanded memory is available, ORNL recommends using Quarterdeck Expanded Memory Manager to allow FoxPro access to all available RAM. This expanded memory specification, which must meet the Lotus/Intel/Microsoft™ (LIM) 3.0 standard, increases the processing speed approximately 100%.

3.3.3 Software Requirements

The IBS-P software to be tested was installed using floppy diskettes. The IBS-P is programmed using the FoxPro database management system. It will use a Runtime version of FoxPro, and, thus, a copy of the FoxPro software will not be required. Record layouts for the IBS-P data files are given in Appendix A of the IBS-P Database Specifications (see reference in the Preface to this report).

Contact with interfacing systems (see Table 3.1) was simulated by the IBS-P. Input and output interfacing files (file structure/layout) were provided as part of the installation package. Reference data files were also loaded as part of the IBS-P installation package provided by ORNL developers, who used data files provided by MTMC during the development process.

3.3.4 Personnel Requirements

MTMC personnel who participated in the CDR were identified by HQ MTMC's IBS-P Technical Project Officer and by contacts at the Eastern and Western Area Commands. The persons who observed and commented on the software included personnel from the booking branches, Cargo Management Branch, Systems Management, Information Management, Terminals Division, and HQ MTMC.

3.3.5 Orientation Plan

No special training was required for operation and testing of the IBS-P. An IBS-P Implementation Procedures document was prepared by ORNL. A short set of installation instructions, which were part of the Implementation Procedures, were sufficient for the tester to install the programs. ORNL developers also provided MTMC with an IBS-P End-User's Handbook.

3.3.6 Test Materials

ORNL supplied diskettes containing the IBS-P programs, reference data files, and sample input data. The reference data files were copies of data supplied by MTMC. These datasets were used during development and were not current at the time of the testing. (Expected output results must be based on the version of reference and sample data used as inputs.) "Live" data entered from the data-entry screens were allowable when criteria for matching the reference data in the IBS-P limited reference data files were followed. These data-entry criteria were provided to each site in a memo and were included in Appendix A of the IBS-P Installation Plan (included as Part II of this document).

The site at which the software was tested supplied the system hardware, operating system software, and peripherals listed in Section 3.3.2. No other test materials were required.

3.3.7 Security

No special requirements for security are connected with the testing of the IBS-P. The IBS-P is not an operational system, and all inputs and outputs were simulated. Classified data were not used.

It should be noted that security with regard to the target IBS is a major issue. The problems concerning security are examined in the IBS FD and must be included in the PT for the target IBS.

3.4 ACCEPTANCE TESTING

After the CDR, the system IBS-P functionality was enhanced to provide capabilities for limited wartime nonunit cargo moves, additional system utility features, sample on-line help screens, breakbulk requests, and additional reporting features. In addition, as per changed directions of the tasking, operational capability for certain limited functionality of IBS-P was added.

Thus, the Final Acceptance Testing was conducted at ORNL. Personnel from HQ MTMC and from the Eastern Area Command tested the final deliverable system. Testing primarily concerned the operational capabilities of the Saudi Arabia version. After final additions and corrections were included, installation diskettes of the final prototype software were prepared and delivered to HQ MTMC and to the Area Commands. A final in-progress review was conducted at HQ MTMC at the end of March 1991. No additional changes to the software were required.

4. TEST SPECIFICATION AND EVALUATION

4.1 TEST SPECIFICATION

All performance, operational, and functional requirements for the IBS-P are listed in Appendix A. Appendix B contains general testing guidelines.

4.2 TEST METHODS AND CONSTRAINTS

4.2.1 Test Conditions

The testing was conducted using IBS-P software programs and database structures. All reference data needed for the test were loaded by the software developer prior to testing. Testing was constrained by the currency and completeness of reference data; that is, results were based on the contents of the reference files. Because interfaces to other systems (including TACOS, the artificial intelligence system to be "contained within" the target system) were simulated for the prototype, ORNL provided the data needed to demonstrate these interfaces on the installation diskettes. Sample test data (e.g., requests for bookings) were also provided by ORNL. It was required that test data entered from the keyboard via data entry screens conform to certain restrictions regarding dates and ports because of the limitations of the reference data. Guidelines explaining these restrictions were provided.

The interface with TACOS was simulated in a limited fashion. The only peacetime containerized nonunit move bookable within IBS-P was a containerized move to Panama.

4.2.2 Extent of Test

The first testing (CDR) tested all prototype functional requirements except system utilities (Appendix A, O400), on-line help (F500), and wartime nonunit moves (F300). In addition, functions performed by TACOS in the final IBS, functions pertaining to communications capabilities with interfacing systems, and functions marked as "N/A" in Appendix A were discussed with respect to the target system but were not tested. The final testing (Final Acceptance Test) examined sample lists of system utilities, sample on-line help screens, and example screens for wartime nonunit moves.

4.2.3 Data Recording

Data inputs and expected outputs were documented by HQ MTMC, as necessary. Actual data outputs and reports were compared to the expected results. Program changes were discussed; all changes that were required for the Saudi Arabia version to be operational were incorporated into the prototype software. Software changes that were unnecessary with respect to the Saudi version of the prototype but which are requirements for the target IBS were documented. These functional requirements will be included in the FD for the target IBS.

4.2.4 Test Constraints

Limitations imposed on the testing were due to (1) the previously documented design limitations because the system is a prototype and not the target IBS (see Section 1.1 and Appendix A); (2) simulated input and output files; and (3) the lack of an interface with TACOS. IBS-P developers have programmed the prototype with the understanding that TACOS will perform all peacetime nonunit booking and have thus simulated this interface with TACOS. Because the TACOS interface is only simulated, not all moves are possible. For a fuller description of this test constraint, see Section 5.3.

4.3 TEST PROGRESSION

ORNL developers provided a demonstration of the software. Software for the CDR was loaded at each of the three sites for testing by the user community. Software for the Final Acceptance Testing was provided to the three sites on diskettes. The following suggestions for test progression were provided to the test sites. No comments were received on the final system software.

Each module and submenu level shall be tested thoroughly before testing begins for a different module or submenu level. The three modules of the IBS-P are Peacetime Resupply, Unit Moves, and Wartime Resupply.

Within each module, a logical progression of activities based on functional activities will be assumed. For example, the first submenu level within the Peacetime Resupply module offers options for performing functions associated with Cargo Movement, Vessels and Carriers, the Cargo Management Branch, MSC Rates, and System Utilities. The option Cargo Movement cannot be processed without MSC Rates and Vessels Schedules being present. The reports that are produced under the Cargo Management Branch option cannot be produced until cargo has been booked and lifted.

4.4 TEST EVALUATION

For each requirement being tested, a software test must be run. If additional tests are constructed and run during the official test, the input for and results of the additional sample runs must also be documented. Sufficient time should be allocated for conducting system testing without interruption. If an interruption occurs in the testing procedures on the microcomputer being used for the test, the module or submenu level being tested at the time of the interruption must be reinitiated and retested in its entirety.

All printed outputs resulting from system testing will be compared manually with the expected output.

5. DESCRIPTION OF TESTING PROCEDURES

This chapter describes test procedures and the testing sequence. Appendix B describes general test guidelines. These guidelines were prepared by ORNL for use by personnel at the test sites.

One control employed during testing is to use the same test case during all testing within a functional module of the system. For example, to test the peacetime containerized nonunit movement requests module, the same movement requests should be used throughout the logical sequence of execution. The movement requests should be created, then processed, then offered, and finally booked.

The testing methods will answer the following questions.

- (1) Does the system accurately perform the defined processes and produce accurate results.
- (2) Are the options operationally correct?
- (3) Are actual results equivalent to expected results? Are the results presented in a useful manner?

5.1 DESCRIPTION OF PERFORMANCE SYSTEM TESTS

Because the IBS-P was a prototype rather than an operational system, certain performance and operational characteristics were not applicable and therefore not tested. The performance requirements for the IBS-P were correctness and reliability (see Appendix A). During testing, the following activities were conducted.

- (1) Test for numerical accuracy in actual results.

- (2) Compare actual results to expected results.
- (3) Test for consistency of units used within each process.
- (4) Test for production of consistent results among all modules given the same data and parameters.

5.2 DESCRIPTION OF OPERATIONAL SYSTEM TESTS

Operational system testing evaluates the subjective quality of usability. During prototype testing, it was extremely important to assess the user reaction so that the target system could be designed for maximum usability. Operational testing also involved testing system utilities and documentation. Appendix A lists specific requirements to be addressed.

During testing, the following activities were conducted.

- (1) Observe all aspects of the user interface for consistent behavior throughout the system.
 - (a) All data entry screens should operate consistently using the same format.
 - (b) All menu screens should operate consistently using the same format.
 - (c) If popup windows exist, they should follow a consistent format and operation convention.
 - (d) All functions within the system should provide the capability to be used with the mouse or the keyboard.
 - (e) The operation of the mouse and the keyboard should be consistent between modules. That is, defined mouse and keyboard operations should produce the same effects regardless of the module they are used in.
- (2) Review all documentation to ensure that the system operates as noted.
- (3) Test system utilities to ensure that the reference files for the system can be maintained.

- (4) Ensure that the system is suitable for demonstration purposes. (As noted in Appendix A, this criteria includes several specific points, including algorithm feasibility, human-computer interface, database design, and help.)

5.3 DESCRIPTION OF FUNCTIONAL SYSTEM TESTS

The IBS-P system performed all required functions (see Appendix A) and produced the expected results. The IBS-P main menu screen indicates that IBS-P contains three modules: Peacetime Resupply, Unit Moves, and Wartime Resupply. Specific requirements for each of these modules are listed in Appendix A, under Requirements F100, F200, and F300.

The menu options under Peacetime Resupply (F200 in Appendix A) are Cargo Movement, Vessels and Carriers, Cargo Management Branch, MSC Rates, and System Utilities. The Vessels and Carriers and System Utilities menu options are independent functions and may be tested at any time. The MSC Rates functions were not developed. Constraints were necessary for proper testing of the Cargo Movement and Cargo Management Branch functions:

- The following logical sequence must be used in testing:

- Cargo Movement functions

- Add/Update cargo movement request

- Process cargo movement request

- Offer cargo movement request

- Book cargo movement request

- CMB functions

- To process a peacetime containerized nonunit move, the following data constraints must be followed:

- Type offer = C,V

- Ocean Commodity Code = B,E,F,G

- Transportation Priority = 3

- Reoffr_poe = An East, West, or Gulf Coast port

POD = BA1 (Balboa, Panama)
CONUS Drayage Group = Lexington, KY
OCONUS Drayage Group = Balboa, Panama
A ship schedule with stop at BA1 and dates coinciding with the request dates must exist

The menu options under the module Unit Moves (F100 in Appendix A) include Movement Requirements, Channels, Reports, Export UCR, ATCMD, and System Utilities. Constraints were necessary for proper testing of a unit move:

- To process a unit move, the following data constraints must be followed because of data limitations.
 - (1) Only requests that have defined inland transit times from origin to POE may be processed.
 - (2) The distance between the POE and POD specified must be defined in the IBS-P database. (These distances were derived from Table 17 of MTMCTEA Pamphlet 700-2, Logistics Handbook for Strategic Mobility Planning.)
 - (3) The Joint Operation Planning and Execution Systems (JOPES) data entry information must be completed and channels defined in order to create a scenario specific database and to test remaining unit move options.
- To process a wartime resupply move, the same data constraints that cover peacetime resupply are in effect.

Additional functionality is provided for the IBS-P through simulation of interfaces with other systems and organizations. These requirements are given in Appendix A, F400. Output reports of the IBS-P are enumerated in F500 of Appendix A. The required reference files are listed in F600 of Appendix A.

5.4 TEST TERMINATION

When testing of the entire IBS-P system is complete, the responsible HQ MTMC test coordinator will gather all printed output, all screen dumps, all records of test results, operator records, and any other indicators of test results. These materials will be evaluated by the MTMC IBS Technical Project Officer and incorporated as appropriate in the Test Analysis Report to be prepared by HQ MTMC.

6. SUMMARY AND CONCLUSIONS

The purpose of IBS-P testing was to demonstrate the prototype system's capability. This PT lists system requirements (Appendix A) and general test guidelines (Appendix B). Actual testing for the CDR and the Final Acceptance Testing was conducted by HQ MTMC in coordination with the Area Commands. A Test Analysis Report will be prepared by HQ MTMC. This report will identify system deficiencies and desirable enhancements. It will be used by developers of the target IBS. In addition, the IBS FD will incorporate system refinements and recommendations for new or revised functional, operational, and performance requirements that were determined to be desirable after completion of the IBS-P.

Thus, thorough testing of the prototype system will help ensure that appropriate system capabilities and functionality are included in the target IBS.

APPENDIX A

REQUIREMENTS SPECIFICATIONS FOR THE INTEGRATED BOOKING SYSTEM PROTOTYPE

Because one purpose of the IBS-P is to provide guidance for the target IBS, some performance and operational requirements are listed below that must be quantified for the target system. Many of these requirements, however, are inappropriate for quantification for a proof-of-concept prototype system; these are listed as "Not Applicable" (N/A).

A.1 PERFORMANCE REQUIREMENTS (TECHNICAL CHARACTERISTICS)

- P100 Correctness and reliability
 - P101 All numeric calculations shall produce accurate results.
 - P102 All algorithms shall produce accurate results.
 - P103 All results shall be expressed in units of measure that are meaningful to operational users.
 - P103.1 Weights shall be expressed in pounds and cubic feet.
 - P103.2 Volumes shall be expressed in MTONs.
 - P103.3 POL cargo shall be measured to the nearest hundred barrels.
 - P103.4 Height, length, and width measurements shall be to the nearest inch.
 - P103.5 Location shall be expressed in degrees, minutes, seconds, and hemisphere.
 - P104 A cargo movement request shall be traceable through the system from initial entry, through offering, to a status of booked and lifted.
 - P105 Code consistency. N/A
 - P106 Code completeness. N/A
 - P107 Software quality assurance program. N/A
 - P108 Audit program. N/A
 - P109 Configuration management program. N/A
 - P110 Data quality policies and procedures. N/A

- P200 Efficiency and timing. N/A
 - P201 Execution efficiency. N/A
 - P202 Storage efficiency. N/A
 - P203 Data standards. N/A
 - P204 Responsiveness. N/A

- P300 Portability. N/A
 - P301 Capacity limits. N/A
 - P302 Machine independence. N/A
 - P303 Modularity. N/A
 - P304 Documentation. N/A

- P400 Flexibility. N/A
 - P401 Generality. N/A
 - P402 Expandability. N/A
 - P403 Compatibility. N/A

A.2 OPERATIONAL REQUIREMENTS

- O100 Usability.
 - O101 The prototype shall demonstrate the feasibility of development of the target IBS.
 - O102 The database design shall be efficiently structured (within the constraints of the prototype architecture).
 - O103 The user interface shall provide an effective and efficient tool for accessing and using the IBS-P.
 - O104 The screen faces shall be consistently formatted.
 - O105 Pull-down and/or pop-up windows shall be provided as appropriate.
 - O106 Both mouse and keyboard access shall be provided and shall be functional for all operations.
 - O107 The MTMC staff must be able to use the IBS-P after minimal explanation.
 - O108 The user interface shall be user friendly (as judged by the end users who review the system during testing).
 - O109 The database management system shall be appropriate for a prototype system (that is, it should have all necessary data elements to perform functionally, but it need not be a final design).
 - O110 Training, training manuals, computer-aided instruction, etc. N/A
 - O111 Limited on-line help shall be provided for sample fields that are identified as needing additional information.

- O200 Maintainability. N/A
 - O201 Modularity. N/A
 - O202 Simplicity. N/A
 - O203 Conciseness. N/A
 - O204 Consistency. N/A
 - O205 Self-descriptiveness. N/A

- O300 Security. N/A
 - O301 Access control. N/A
 - O302 Data control. N/A
 - O303 Software, hardware, network, and facility control. N/A
- O400 System utilities.
 - O401 Access to information necessary to maintain the IBS-P will be available through a system utilities module.
 - O402 Information on system usage (audit trail) will be available. N/A
- O600 Documentation.
 - O601 A Database Description document shall be provided.
 - O602 An Implementation Procedures document, including a brief installation guide shall be provided.
 - O603 An End-User's Handbook shall be provided.
 - O604 A User Interface Guidelines document shall be provided.
 - O605 A Developmental Test Plan shall be provided.
 - O607 Maintenance Manual, System and Programming Specifications, etc. N/A

A.3 FUNCTIONAL REQUIREMENTS

- F100 Unit Moves (peacetime exercises and wartime moves).
 - F101 Simulate receipt of data files from and return of updated files to JOPES.
 - F102 Simulate receipt of the AUDEL from FORSCOM and UELs from other service branches. N/A
 - F103 Simulate receipt of the UMD from ITOs. N/A
 - F104 Compare DTS data (the AUDEL, UEL, and UMD) with JOPES data. N/A
 - F105 Group data by operation.
 - F106 During peacetime exercises, perform a port cost analysis. N/A
 - F107 Create and delete channels.
 - F108 Reorganize SPOE assignments based on a minimum measurement tonnage cutoff figure.
 - F109 Run feasibility model to determine if origin-SPOE and SPOE-SPOD transit times will meet the RDD/LAD.
 - F110 Simulate transmittal of offerings to and ship assignments from MSC.
 - F111 Simulate transmittal of movement requirements to and receipt of carrier assignments from MTIN, as appropriate.
 - F112 Simulate transmittal of messages to CINC, USTRANSCOM, and other appropriate organizations.
 - F113 Allocate cargo to ships via both automated and manual procedures.
 - F114 Establish port call dates.
 - F115 Create Port Call Message and UCR.
 - F116 Simulate transmittal of UCR.
 - F117 Receive and maintain ship schedules.
 - F118 Graph port usage by day.

- F200 Peacetime nonunit moves.
 - F201 Simulate receipt of a request from a shipper.
 - F202 Validate the request, including validating DODAACs, lading term codes, port codes, commodity codes, transportation mode codes, funding agency codes, cancel and delay codes, carrier ids, booking reasons, dates, and van size.
 - F203 Validate shipment unit records for breakbulk requests.
 - F204 Allow the user to query the database through both ad hoc and preformed queries.
 - F205 Simulate receipt of vessel schedules from carriers.
 - F206 Update existing request.
 - F207 Process the request to determine "best" carrier and/or allow user to choose a different carrier.
 - F208 Simulate offering the booking to the carrier.
 - F209 Book the request.
 - F210 Simulate transmittal of ETR to requestor. N/A
 - F211 Simulate transmittal of skeletal ATCMD. N/A
 - F212 Compare loadlist with SOCO.

- F300 Wartime nonunit moves.
 - F301 Complete requirements F201-F206 and F209-F211 listed under F200 for "peacetime nonunit moves."
 - F302 Simulate receipt of vessel schedules.
 - F302 Book shipments based on meeting the RDD at the destination, cargo priority, and a stow factor of 75%.

- F400 Interfacing systems.
 - F401 Interfacing systems for the target system shall be identified at appropriate points in the IBS-P program.
 - F402 All interfaces shall be simulated for the IBS-P.
 - F403 Data needed for the simulation of interfacing systems shall be provided on floppy diskettes.
 - F404 Assumptions concerning each interfacing system that is being simulated shall be documented in the Functional Description for the target IBS.

- F500 Reports.
 - F501 Provide the following hard-copy reports: list of infeasible ULNs for deployment, Container Lift Report, SOCO Report, ETRR, UIC Detail Report, Channel Summary Report, Port Workload Report, Cargo Offering to MSC, Lifted vs Booked Report, Carrier Usage Reports, Ship Schedule.
 - F502 Provide the following onscreen reports: same as above plus Port Call Message.
 - F503 Provide additional management reports as determined by the Terminals Division. N/A

F600 Reference files.

F601 IBS-P shall provide the following reference files: Geofile, MAD, Ports Datafile, estimated ocean transit times, ship loading and unloading times, average ship characteristics data, distance between ports, land mileage between CONUS military activities and major U.S. ports, MSC rate tables, vessels file.

F602 Maintain the above reference files. N/A

APPENDIX B

GENERAL GUIDELINES FOR TESTING SOFTWARE FOR THE INTEGRATED BOOKING SYSTEM PROTOTYPE

B.1 GENERAL

1. Within each module or process try every available option.
2. Try aborting processes (Exit) whenever offered at every point within process.
3. Run each process through completely without aborting to test complete procedure and results.
4. Enter appropriate data where input is required.
5. Do not enter data. Program should do one of two things -- continue or prompt for reentry.
6. Try to enter data into nonenterable fields on data entry screens.
7. Test all report and print features.
8. Try to enter "bad" data at all points in the process.

B.2 DATA-ENTRY SCREENS

The following procedures should be used to test each data entry screen within the IBS-P system:

- (1) Testing record movement:
 - (a) Test that clicking with the mouse on the upper portion of the sidebar causes the cursor to move to the previous record. This action may also be invoked by pressing the PgUp key. If the current record is the first record, there will be no record movement.
 - (b) Test that clicking with the mouse on the lower portion of the sidebar causes the cursor to move to the next record. This action may also be invoked by pressing the PgDn key. If the current record is the last record, there will be no record movement.

- (c) Test that clicking with the mouse on the up arrow portion of the sidebar causes the cursor to move to the top of the data file. This action may also be invoked by pressing the Ctrl-PgUp key combination. If the current record is the first record, there will be no record movement.
 - (d) Test that clicking with the mouse on the down arrow portion of the sidebar causes the cursor to move to the bottom of the data file. This action may also be invoked by pressing the Ctrl-PgDn key combination. If the current record is the last record, there will be no record movement.
 - (e) Test that clicking with the mouse anywhere else is innocuous.
- (2) Testing field movement:
- (a) If the mouse is clicked on the right half of the bottom bar, the cursor should go to the next field on the screen. This action may also be invoked by pressing the down arrow key. If the cursor is on the last field, the cursor should go to the first field.
 - (b) If the mouse is clicked on the left half of the bottom bar, the cursor should go to the previous field on the screen. This action may also be invoked by pressing the up arrow key. If the cursor is on the first field, the cursor should go to the last field.
- (3) Testing Help:
- Select the Help option while the cursor is positioned on a field (any field). The Help window should appear. Hit the <ESC> key or click the mouse to remove the Help window and return to the current field. Hit any key other than <ESC> and the results should be innocuous.
- (4) Testing the Add function:
- (a) Select the Add function. Data elements will be copied from the screen on which "add" was selected to a new record. Modify fields as appropriate.
 - (b) To determine if the record was added properly:
 - Exit the data entry screen and save the changes.
 - Reenter the data entry screen and go to the bottom of the file. This record should be the record just added.

(5) Testing the Delete/Restore function:

Delete:

- (a) Select the Delete/Restore button.
- (b) Exit and save changes.
- (c) Reenter data entry screen.
- (d) Confirm that record was deleted.

Restore:

- (a) Select the Delete/Restore button.
- (b) Reselect the Delete/Restore button.
- (c) Exit and save changes.
- (d) Reenter data entry screen.
- (e) Confirm that this record still exists.

(6) Testing Cut/Uncut and Paste functions:

- (a) Select the Cut/Uncut button.
- (b) Add a new record.
- (c) Select Paste. This should add data to the new record which is identical to the record which was cut.
- (d) Select Cut/Uncut.
- (e) Add another record.
- (f) Select Paste. All fields should remain blank.
- (g) Delete both records added.
- (h) Exit and save changes.

- (7) Testing the Lookup function:
- (a) Move the cursor to a field for which the Lookup button is highlighted.
 - (b) Select the Lookup button.
 - (c) A popup window should appear which contains valid choices for the current field.
 - (d) Choose a value and it should automatically be placed in the current field.
- (8) Testing the Exit function:
- (a) Test Saving Changes by making changes to data in a record and saving them. If these changes are still present upon reentry into the data entry screen, the changes were saved properly.
 - (b) Repeat process from (a) above to test the Cancel Changes option. The only difference is that the changes will not be saved.
 - (c) The Return to Edit option should abort the exit and return immediately to the current field on the data entry screen.
- (9) Testing the calendar function:
- MOUSE:
- (a) The 'm' at the top of the sidebar should move the date back one month.
 - (b) The 'Y' at the top of the sidebar should move the date back one year.
 - (c) The 'm' at the bottom of the sidebar should move the date forward one month.
 - (d) The 'Y' at the bottom of the sidebar should move the date forward one year.
 - (e) 'Today' moves to the current date.
 - (f) 'Undo' undoes the last action taken.
 - (g) 'Days' allows you to enter the number of days before or after the

date selected.

- (h) Clicking on the lower portion of the sidebar should move the date one day forward.
- (i) Clicking on the upper portion of the sidebar should move the date one day backward.

KEYBOARD:

- (a) The 'PgUp' key should move the date back one month.
 - (b) The 'Ctrl-PgUp' key combination should move the date back one year.
 - (c) The 'PgDn' key should move the date forward one month.
 - (d) The 'Ctrl-PgDn' key combination should move the date forward one year.
 - (e) 'Today' moves to the current date.
 - (f) 'Undo' undoes the last action taken.
 - (g) 'Days' allows you to enter the number of days before or after the date selected.
 - (h) The right arrow and space keys should move the date one day forward.
 - (i) The left arrow and backspace keys should move the date one day backward.
- (10) Testing other buttons:

Try any other available buttons. If the selection contains suboptions, test each suboption thoroughly.

B.3 SELECTION MENUS

Every selection menu will contain the following two options: Exit and Accept:

- Exit - This means that the current selections will be deselected and the current process will be aborted.
- Accept - This will be either a button or hot key in the case of a multiple selection menu, or an <Enter> or mouse click on a single selection menu. This should accept the current selection(s) and continue processing.

Selection menus may or may not contain all of the options listed below:

- Help - Not fully implemented at this time. Help currently provides a "not available" message.
- Search - Varies, but in general allows the user to search on key fields using specified criteria.
- Next - Should find next occurrence of specified search criteria.

Other available buttons should be selected and tested for operational correctness.

**TEST PLAN AND IMPLEMENTATION PROCEDURES
FOR THE
INTEGRATED BOOKING SYSTEM PROTOTYPE (IBS-P)**

**PART II
IMPLEMENTATION PROCEDURES**

1. GENERAL

1.1 PURPOSE OF THE IMPLEMENTATION PROCEDURES

The objective of the Implementation Procedures (IP) for the Military Traffic Management Command's (MTMC's) Integrated Booking System Prototype (IBS-P) is to provide the information necessary for installation of this prototype at three sites: MTMC Headquarters (HQ MTMC), MTMC's Eastern Area (EA) Command, and MTMC's Western Area (WA) Command.

It should be noted that this IP covers implementation procedures for the IBS-P only. A separate IP will need to be written to describe implementation procedures for the target IBS. Explanations of the purposes of the IBS and the IBS-P are given in the following sections.

1.2 THE IBS

The IBS will be a lead execution system of the Defense Transportation System (DTS) for international surface cargo in both peacetime and wartime. IBS will support traffic management within MTMC and respond to the requirements of both commodity managers and war planners. IBS will provide continuous access to information about international surface cargo movement and will eventually be fielded at both Continental United States (CONUS) and Outside the Continental United States (OCONUS) sites. It is proposed that IBS will exchange data with other systems through a corporate database, via ASCII files, and via hard-copy reports and manual access, as appropriate.

IBS must receive information from and transmit information to both classified and unclassified systems. It is planned, however, that all data in IBS will be unclassified. Therefore, IBS will be an unclassified system and will use similar procedures in both peacetime and wartime.

1.3 THE IBS-P

The prototype conceptually defines an approach for development of the target IBS. Because it reflects the functional requirements of the target system, the IBS-P can help determine technical solutions to interface problems, the appropriate database design, system sizing requirements, an appropriate user interface, performance measurements, and system architectures for the fully developed IBS. The IBS-P tests concepts associated with development of the IBS, verifies the feasibility of a proposed modeling solution, further defines functional requirements, and promotes an understanding of full-operational-capability design information. The elements of the prototype include booking unit cargo moves (exercises and contingencies) and nonunit cargo moves (peacetime and wartime).

There are anticipated differences between the IBS and the IBS-P. For example, the IBS-P will operate on IBM-compatible microcomputers; however, the target IBS is not currently proposed as a microcomputer-based system. Additionally, all interfaces for the IBS-P are simulated; thus, no actual data exchange occurs during operation of the IBS-P.

1.4 PROJECT REFERENCES

Directorate of International Traffic, Military Traffic Management Command. Integrated Booking System: Mission Element Needs Statement. UNCLASSIFIED. July 1989.

Headquarters, Department of the Army. Army Life Cycle Management of Information Systems. UNCLASSIFIED. Army Regulation 25-3. November 1989.

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Oak Ridge National Laboratory. Project Plan for the Integrated Booking System Prototype (IBS-P). UNCLASSIFIED. November 1989.

U.S. Department of Defense. Military Standard Transportation and Movement Procedures (MILSTAMP). UNCLASSIFIED. October 1988.

U.S. Department of Defense. Military Standard: DOD Automated Information Systems (AIS) Documentation Standards. UNCLASSIFIED. DOD-STD-7935A. October 1988.

1.5 TERMS AND ABBREVIATIONS

AC	Area Command
AIS	Automated Information System
ASCII	American Standard Code for Information Interchange
ASPUR	Automated System for Processing Unit Requirements
CONUS	Continental United States
DOD	Department of Defense
DTS	Defense Transportation System
EA	Eastern Area
HQ MTMC	MTMC Headquarters in Washington D.C.
IBM	International Business Machines
IBS	Integrated Booking System
IBS-P	Integrated Booking System Prototype
IP	Implementation Procedures
LAD	Latest Arrival Date
MILSTAMP	Military Standard Transportation and Movement Procedures
MTMC	Military Traffic Management Command
MTIM	Information Management (MTMC Directorate)
MTIT	International Traffic (MTMC Directorate)
POD	Port of Debarkation
POE	Port of Embarkation
RAM	Random Access Memory
RDD	Required Delivery Date
OCONUS	Outside the Continental United States
ORNL	Oak Ridge National Laboratory
TACOS	The Automated Container Offering System
WA	Western Area

2. IMPLEMENTATION OVERVIEW¹

2.1 DESCRIPTION

This IP describes activities related to the implementation of the IBS-P, a prototype software system. IBS-P will be installed at three sites: HQ MTMC, Alexandria, Virginia; MTMC EA, Bayonne, New Jersey; and MTMC WA, Oakland, California. The purpose of the prototype is to identify requirements for the target IBS; however, this IP does not define implementation procedures for the target system.

The final IBS-P software, developed by Oak Ridge National Laboratory (ORNL) personnel, will be installed at HQ MTMC by ORNL and will be demonstrated to representatives of all three sites. Using the installation procedures given in Appendix A, MTMC personnel will conduct testing at each of the three sites. An IBS-P Test Plan will be developed prior to the installation.

2.2 CONTACT POINT

For questions concerning the IBS-P program, the contact point is

Mr. Bob Porter
MTIT, MTMC Headquarters
Military Traffic Management Command
5611 Columbia Pike
Falls Church, VA 22041-5050
Phone: (703) 756-1627

¹This chapter is written in the future tense because the Implementation Procedures report was provided to MTMC prior to final implementation of the software in March 1991. It was not deemed necessary to change the wording for this version of the report.

2.3 SUPPORT MATERIALS

Because IBS-P is not intended to be a fully operational system, only a limited quantity of support materials is required. These include, for each site, a personal computer system (Section 3.1.3), floppy disks, and printer paper. Documentation to support the prototype software includes the Database Description, Test Plan, User Interface Guidelines, End-User's Handbook, and this IP.

2.4 TRAINING

No special training is required. ORNL will present a demonstration of the software, including an explanation of basic operations. In addition, an IBS-P End-User's Handbook and an IBS-P Development Test Plan have been prepared by ORNL. A brief IBS-P Installation Guide and Guidelines for IBS-P Data Preparation and Entry are included in this report (Appendix A). After installation, the ORNL development team will be available for phone consultation if required.

2.5 TASKS

Each task required for installation of the IBS-P is described below. The organization that is responsible for accomplishing the task is identified as MTMC International Traffic (MTIT); MTMC Information Management (MTIM); or ORNL, the developer.

- Overall planning, coordination, and preparation for implementation: MTIT
- Manuals and other documentation: ORNL
- Technical assistance: ORNL
- Training activities as required: ORNL
- Scheduling: MTIT and ORNL
- Comprehensive support: MTIT
- Completion of site prerequisites: MTIT
- Personnel for the implementation team: MTIT and ORNL
- Computer support: MTIM

2.6 PERSONNEL ORIENTATION

Section 3.1.3 of this report describes the system requirements. A briefing at HQ MTMC will familiarize users from HQ MTMC and the Area Commands (ACs) with system features. Training, if required, will be provided during hands-on practice sessions. In addition, final versions of the End-User's Handbook and the User Interface Guidelines will be provided when the final software is delivered. Appendix A of this report provides additional information on installation and test data entry. No other personnel orientation will be required.

After the software is installed at the ACs, if additional instruction is required, ORNL developers will be available for phone consultation.

2.7 PERSONNEL REQUIREMENTS

The purpose of the IBS-P is to aid in definition of the target IBS. Therefore, the time required to operate the system is an investment in the future value of the fully operational IBS system. There are no specific requirements, however, for operation of the IBS-P since it is a prototype rather than a fully operational system. The type of personnel who should work with the IBS-P are those individuals who will be operating the target IBS, including Ocean Cargo Clearance Authority booking technicians and personnel from the Cargo Management Branch, Systems Management Division, and Terminals Division. In addition, management personnel should be involved in the review to provide a broader perspective.

2.8 SECURITY

Because the IBS-P will only simulate data transfer and because the test data files will contain no classified data, there are no security requirements for the IBS-P.

3. SITE INFORMATION

This chapter includes site information concerning both computer operations and user interactions required for installation of the IBS-P software. Three sites will receive the software: HQ MTMC and EA and WA commands.

3.1 MTMC HEADQUARTERS

The IBS-P will first be installed at HQ MTMC; personnel from the EA and WA commands will be present for this installation. A formal installation by the software developers will be completed only at the HQ MTMC site. EA and WA command personnel will install and run the software at their respective sites.

3.1.1 Schedule

The following schedule is established for installation of the IBS-P at HQ MTMC:

- Day -2: MTMC personnel will ensure that all necessary hardware and peripherals are available.
- Day -1: ORNL personnel will load all necessary application software and data files; ORNL will provide necessary documentation. MTMC personnel may be present to observe the loading procedures.
- Day 0-2: Personnel from ORNL will brief MTMC personnel concerning the IBS-P. Personnel from HQ MTMC, EA, and WA commands will conduct acceptance testing activities. ORNL personnel will be present to provide technical assistance, if needed.
- Day 3: Personnel from the ACs will complete testing and return to their respective command sites with copies of the prototype software and documentation for additional testing and review.

Day 14: Recommendations resulting from the acceptance testing will be assimilated by the HQ MTMC IBS/IBS-P Program Manager and made available to MTMC and ORNL, as appropriate.

After receiving the IBS-P acceptance testing results, ORNL will incorporate necessary design revisions and additional enhancements into the Functional Description of the target system. Additional programming of the IBS-P to modify or enhance its capabilities beyond its conceptual design will not be required because the primary purpose of the IBS-P is to provide a proof-of-concept system and to define the requirements for the target IBS.

3.1.2 Software Inventory

Application software programs, reference files, and test data files are required to support the implementation. No programs or files are classified. All software programs, reference files, and sample test data files will be provided by the developer. Test data prepared and entered by HQ MTMC must conform to certain limitations, which are explained in Appendix A. It should be noted that one of the most important interfaces for the target IBS is with The Automated Container Offering System (TACOS), an artificial intelligence system. This interface will be simulated for the IBS-P. Therefore, only limited nonunit bookings will be possible in IBS-P.

3.1.3 Facilities

The following system configuration is required for installation of the IBS-P:

- an IBM-compatible 286 or 386 system,
- at least 2 megabytes of random access memory (RAM),
- a Microsoft-compatible mouse with driver loaded,
- an EGA or VGA graphics card with appropriate color monitor,
- at least 40 megabytes of free disk space, and
- MS-DOS or PC-DOS version 3.3 (or later).

When expanded memory is available, ORNL recommends using Quarterdeck Expanded Memory Manager to allow FoxPro access to all available RAM. Each site is responsible for providing floppy diskettes and printer paper.

No special site preparation is required with the exception of the availability of an area large enough for the above system configuration and the testing team. All training (beyond the brief demonstration provided by the developer) will be provided through hands-on experience during the three days of formal testing and through system documentation.

3.1.4 Procedures

Procedures for formal testing of the IBS-P are described in the IBS-P Test Plan. Instructions for operation of the IBS-P are described in the IBS-P End-User's Handbook. A brief installation guide and guidelines concerning data entry will be provided with the software to be installed at the EA and WA commands. These guidelines are also included in this IP as Appendix A. No additional information is required.

3.2 MTMC EA AND WA COMMANDS

Installation at MTMC EA and WA will occur following installation and formal testing at HQ MTMC. General procedures will be identical with two exceptions: (1) ORNL personnel will not be present to install the IBS-P software and files, and (2) the primary purpose of usage at the ACs will be to identify additional requirements desired for the target system rather than to test the IBS-P.

APPENDIX A INSTALLATION AND TEST DATA ENTRY GUIDELINES

A.1 INSTALLATION GUIDE FOR THE IBS-P

The following steps are required for installing the IBS-P software in an IBM-compatible personal computer (see Section 3.1.3 for the appropriate system configuration). Before performing the steps listed below, ensure that the config.sys file contains the following entries:

```
files = 50  
buffers = 24
```

In addition, edit the system's autoexec.bat file to place "IBS" in the path. Reboot the system to make these changes effective.

Finally, complete the following instructions. (NOTE: if drive B is used rather than drive A as the initiation drive, simply replace "A" with "B" in these instructions; if a drive other than drive C is used as the final installation drive, replace "C" with that drive's identification letter in these instructions.)

- Step 1: Insert IBS-P diskette 1 in drive A
- Step 2: Type **a**:<RETURN>
- Step 3: Type **install a c** <RETURN>
- Step 4: Insert diskette 2 when prompted and follow instructions given on screen
- Step 5: Repeat step 4 for the remaining diskettes when prompted
- Step 6: Type **ibs** <RETURN> to run the prototype for processing unit moves; type **runibs** <RETURN> to run the prototype for processing nonunit moves.

After running IBS using the sample test data that is supplied with the system, you should always reset the sample databases to their original condition. This operation has been automated; simply type `reset <RETURN>`.

A.2 GUIDELINES FOR IBS-P DATA PREPARATION AND ENTRY

The successful testing of the IBS-P depends to a great extent on the nature of the test data prepared and entered by test personnel from the MTMC. This section discusses some preliminary "rules" for preparing and entering data for testing purposes. This memo should be used in conjunction with the IBS-P End-User's Handbook, which contains valuable information on using the IBS-P.

Data Entry:

Testing should begin with the populated databases delivered with the IBS-P software. These databases contain the minimum amount of information needed to successfully process several different shipments. After testing the data delivered with the demo, you may want to begin entering new data or modifying existing data. The reference data files used by the IBS-P cannot be modified. However, you can modify such things as movement requirements data and the vessel schedule data. To modify existing data, use the data entry screens accessible from the IBS-P menus. Some of these data screens also have an **Add** option that allows you to enter new data records. However, when you modify existing data or add new data, be sure to "coordinate" changes in other related databases. For example, if you change a shipment's port of embarkation (POE) or port of debarkation (POD), be sure that you use a port from the ports database. Other logical "connectivity" will become obvious as you continue to gather and enter data. Some common instances of "connectivity" are discussed below.

NOTES: Remember that IBS-P reference data files cannot be modified (for example, reference data files like the GEOFILE database). Screens are provided for adding/modifying the data that can be changed. Use the data entry screens provided to modify existing data or add new data.

The runtime version of FoxPro provided with the IBS-P software does not permit accessing database files via command mode or importing data files (for example, ASCII files) from external sources. Interfaces with other systems (for example, TACOS) will be simulated.

Dates:

In order for a shipment to be successfully processed by the IBS-P, dates must be valid and logical. The dates must also be carefully coordinated from database to database.

- The date when the shipment is available for loading must be within the time frame when a ship will be arriving at the POE. Therefore, the shipment dates must be coordinated with dates in the vessel schedule database. That is, at least one record in the vessel schedule database must have arrival and departure times that match the shipment time frame. Use the movement requirements screens and the carriers/vessels screens to check/change data.
- Required delivery dates (RDDs) must be later than today's date. Use the movement requirements screens to modify RDDs.
- In order for peacetime resupply shipments to arrive at the POD on or before the RDD, the vessel the shipment is loaded on must be able to reach the POD by the RDD. For example, if the ship does not leave the POE until after the RDD, the shipment will not arrive at the POD in time. Therefore, RDDs must be coordinated with shipment arrival and departure dates in the vessel schedule database. Use the movement requirements add/update screens and the carriers/vessels screens to check/change data.
- In order for a unit shipment to reach the POD on or before the latest arrival date (LAD), the RDD must be such that the vessel the shipment is on can

reach the POD on or before the LAD. Several factors contribute to the time calculation used to determine whether or not the ship can reach the destination on time: date available + inland transit time to POE + loadtime + ocean transit time. The default loadtime is 2 hours. The inland transit time depends on the mode of transportation (truck, rail, etc.). The ocean transit time is entered by the user on the JOPES data import screen. Coordinate shipment dates with dates in the vessel schedule database (carriers/vessels screen).

Ports:

- Shipment POEs and PODs must be in the ports database. Port codes input by the user on the movement requirements screens will be validated automatically by the system. If an invalid code is input, a list of valid codes will appear. A list of valid codes will also be displayed if the user selects the **Lookup** option while the cursor is in a ports field on a data entry screen.
- At least one vessel must be scheduled to dock at the POE. That is, the vessel schedule database must contain at least one record that matches the shipment POE. Use the carriers/vessels screen to check/change data.

Ships:

- The vessel schedule database must be coordinated with shipment dates (date available, LADs, RDDs, etc.) so that vessels are available during the shipment time frame. Use the carriers/vessels data screens to check/change data.
- At least one vessel must be scheduled to dock at the shipment POE. Match at least one record in the vessel schedule database with the shipment POE. Use the movement requirements and vessel/carrier screens.

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