

Appendix A
Smart Storeroom
Statement of Work

Radio Frequency Technologies:

Smart Storeroom Operational Proof of Concept In support of NAVAL SUPPLY SYSTEMS COMMAND (NAVSUP)

Background: The earlier Smart Storeroom Environmental Proof of Concept involved the evaluation of using Radio Frequency Identification (RFID) and Radio Frequency Data Collection (RFDC) technologies within the USS HARRY S. TRUMAN (CVN-75) Rotatable Pool Storeroom. This sixteen day underway test, which was conducted in an operational environment, demonstrated that use of RF technology is feasible for inventory management within a shipboard environment.

Intent: CNO has directed NAVSUP to “pursue incorporation of RF technology as a long term afloat inventory management solution... [with] the potential to dramatically reduce, if not eliminate, the need for physical inventories” (Message 182252ZOCT 1999). To meet this requirement, NAVSUP has pursued a two-part proof of concept: Environmental and Operational. As documented in the final test report for the Environmental Proof of Concept (delivered in February 2001), demonstrations onboard the USS Harry S. Truman indicate the potential for using RFID and RFDC devices in the afloat environment. The intent of the Smart Storeroom Operational Proof of Concept is to build upon the initial findings of the earlier Environmental Proof of Concept and complete the two-part proof of concept. This complete proof of concept will consider the major pieces required to deploy an RF system to the afloat environment. Specifically, business process analysis, environmental testing, and operational demonstrations will be used to outline the possible deployment configurations and their associated costs, benefits, challenges, limitations, etc.

Objectives: The operational proof of concept will be completed through three (3) distinct yet interactive tasks. These tasks will be performed in accordance with a structured test plan methodology. They will demonstrate the potential uses of RFID/RFDC in shipboard receipt, issue, stow, and inventory processes. This demonstration will show: 1) the ability of RFID/RFDC technologies to provide an acceptable inventory accuracy rate (greater than 99%, as per NAVSUP P-485 Manual), 2) the potential connectivity of RFID/RFDC to existing Navy afloat supply AIS, and 3) workload savings that result from the introduction of RFID/RFDC in afloat supply processes. These tasks and associated deliverables will ultimately be used as decision tools on how to best deploy an RF system to afloat storerooms, meeting the demands for reduced manning while maintaining or improving inventory accuracy.

The organizations responsible for the completion of this SOW are the AIT Technical Team members comprised from the Naval Surface Warfare Center Indian Head Division and the Naval Air Warfare Center Aircraft Division, St. Inigoes. Coordination efforts with SPAWAR (Chesapeake/WizardWorks) are required during the conduct of Task 1 through Task 3.

Period of Performance: 3/26/01 through 12/31/01

Task 1 – Business Process Analysis

The team shall perform a business process analysis of the supply operations in an afloat Navy environment. The processes to be studied are material receipt, custody, stowage, issue, direct turnover, physical inventories, and location audits. The processes shall be examined under the full range of operating environments, from normal homeport operations to replenishment at sea. For each identified supply process, this study shall examine the manpower requirements (in terms of both FTE and grade/skill levels), physical layout of the areas where these processes take place, the current use of automated information systems (AIS) and automated identification technology (AIT), and applicable instructions and publications.

Deliverable 1.1 – Business Process Analysis

The Business Process Analysis will be a written report that addresses the processes and conditions studied in Task 1. This deliverable is required for the start of Task 3.

Task 2 – Suitability and Environmental Analysis

With information obtained in Task 1, and as preparation for Task 3, one of each of the RFID types shown below shall be selected for the demonstration. The RFID types are: emitter, battery backscatter, batteryless backscatter, and inductive/capacitive. Global and portal capability will be used as appropriate.

Preliminary subtasks will be conducted to determine suitability. Subtasks will include:

1. Mutual interference assessment
2. Propagation tests in VIDMAR cabinets
3. Ship interference assessment
4. Ship layout and RFID placement determination
5. Environmental tests. These tests will be selected to be as representative of real-world conditions as possible, while recognizing the COTS nature of the RFID hardware.

Deliverable 2.1 – Report on AIT Technologies

A final report will detail the results of the tests on RF technologies in the shipboard environment in Task 2. This report will also discuss areas for future study of RFID technology as applicable to Navy/DoD supply chain management.

Task 3 – Business Process Demonstration

The team shall conduct a business process demonstration in an afloat Navy environment. This demonstration shall apply RF technologies selected in Task 2 to the business process analysis completed in Task 1. This demonstration shall be an all-encompassing look at how RF

technology can be inserted into the business processes in an afloat storeroom operation. The team shall set up RF based systems onboard the platform. For the operational afloat time available to the Smart Storeroom Technical Team, the supply operations of the ship shall be run through the most promising RF systems identified by the team using technology identified in task 2. These operations include material receipt, custody, stowage, issue, direct turnover, physical inventories, and location audits. The demonstration shall take place within normal homeport and replenishment at sea processes, though performing the replenishment at sea processes can be mocked up while the ship is in port. Data captured will be sent to a test version of an existing Navy afloat supply AIS. The team shall produce a demonstration plan that shall be reviewed and approved by the sponsor prior to the actual demonstration.

Deliverable 3.1 – Monthly Status Reports

Monthly reports which provide, at a minimum:

- 1) Status of activities completed during the month,
- 2) Planned activities,
- 3) Identification of any problems encountered that would affect the completion of the task order within the parameters of this SOW or the task order and recommended solutions,
- 4) Current costs expended versus scheduled costs,
- 5) Current and cumulative man-hours expended,
- 6) Status on deliverables.

The Monthly Status Reports will cover all tasks in the Statement of Work.

Deliverable 3.2 – Demonstration Plan

The plan will detail the proposed demonstration of applying RF technologies to afloat supply business processes as described in task 3. This plan shall be reviewed and approved by the sponsor prior to starting the demonstration. This plan will be delivered one month prior to the scheduled demonstration and will address the following aspects of the demonstration:

1. Objective
2. Description
3. Method
4. Criteria
5. Resources
6. Schedule

Deliverable 3.3 – Final Report

A final report that details the results of the demonstration of applying RF technologies to afloat supply business processes identified in Deliverable 1.1. This report shall include several possible configurations of RF and other AIT. At a minimum, the studied configurations shall include representative systems that have the following attributes: emitter tags (active), backscatter tags (passive), global systems, portal systems, RFID, and RFDC. Intelligent Tag, hybrids, and other configurations will also be considered. For each configuration, the report shall include the following:

- 1) Description of the RF/AIT configuration,

- 2) List of where new RF/AIT equipment is to be inserted in the ship, to include recommendations of linking or not linking supply cabinets,
- 3) Description of which business processes are affected and how the business processes are affected,
- 4) Estimated cost of RF/AIT hardware,
- 5) Associated logistics issues and their costs of the configuration (to include shelf life of tags and batteries; tagging of items onboard ship, if necessary; removal, reuse, and/or disposal of tags; life cycle support for system hardware; etc.),
- 6) Recommended AIS interfaces (with estimated cost), to be coordinated with SPAWAR Chesapeake,
- 7) Impact on workload for the ship's crew, including estimates for manpower savings (or costs),
- 8) Affected instructions, publications, and training curricula,
- 9) Recommendations and considerations outside the purview of the statement of work, and
- 10) Recommendation for each studied configuration.

The final report will include an overall summary of the three tasks and over-arching recommendations for deploying RFID and RFDC hardware to the afloat environment. This report will also contain a Business Case Analysis (BCA) for the system(s) that receive a positive recommendation in Deliverable 3.3, paragraph 10 above. This BCA will be in the format prescribed by the Navy Logistics AIT Implementation Plan available at <http://www.navy-ait.com>. The foundation for this BCA should come from Deliverable 1.1 and Deliverable 3.3, paragraphs 4 through 9. Changes between current processes and processes using the most promising system from Deliverable 3.3, paragraph 10, will also be portrayed in modeling-simulation software.