AUG 18 1999 20 ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 627027

2. To: (Receiving Organization) B-Cell Cleanout Project		3. From: (Originating Organization) AST Remote Deployment Project		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: Projects 19300		6. Design Authority/Design Agent/Cog. Engr.: <i>EJ Bitten</i>		7. Purchase Order No.: N/A	
8. Originator Remarks: Review & approve				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: N/A	
				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
11. Receiver Remarks:		11A. Design Baseline Document? ☐ Yes ☒ No		14. Required Response Date: August 16, 1999	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	<i>HNF</i> NHF-4991		0	Project Implementation	Q	2		
	<i>JP</i> 8/16/99			Plan: ASTD Remote				
				Deployment				

16. KEY			
Approval Designator (F)	Reason for Transmittal (G)		Disposition (H) & (I)
E, S, Q, D OR N/A (See WHC-CM-3-5, Sec. 12.7)	1. Approval 2. Release 3. Information	4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
1	/	Design Authority EJ Bitten	<i>EJ Bitten</i>	13 AUG 99 L1-04		1	/	JG Riddelle	<i>JG Riddelle</i>	8/14/99	L1-02
1	/	Design Agent DW Crass	<i>DW Crass</i>	13 AUG 99 H0-34		1	/	SH Norton	<i>SH Norton</i>	8/14/99	L1-02
1	/	Cog. Eng. EJ Bitten	<i>EJ Bitten</i>	13 AUG 99 L1-04		3		Central Files			B1-07
1	/	Cog. Mgr. JW Pratt	<i>JW Pratt</i>	16 AUG 99 L1-02		3		DOE/RL Reading Room			H2-53
1	/	QA DH Sandoz	<i>DH Sandoz</i>	8-16-99 L1-06							
		Safety									
		Env.									

18. <i>DWC</i> DW Crass Signature of EDT Originator Date <i>18 AUG 99</i>		19. <i>EJ Bitten</i> Authorized Representative for Receiving Organization Date <i>18 AUG 99</i>		20. <i>EJ Bitten</i> Design Authority/Cognizant Manager Date <i>18 AUG 99</i>		21. DOE APPROVAL (if required) Ctrl No. <i>N/A</i> ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
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PROJECT IMPLEMENTATION PLAN: ASTD REMOTE DEPLOYMENT

D. W. Crass

Numatec Hanford Corporation

Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 627027

UC: 2080

Org Code: 82000

Charge Code: 109134 / B000 ja HN990151

B&R Code: EW3110022

Total Pages: 36

Key Words: Project Plan, ASTD, B-Cell, 324 Building, Remote Procurement

Abstract:

This document is the project implementation plan for the ASTD Remote Deployment Project. The Plan identifies the roles and responsibilities for the project and defines the integration between the ASTD Project and the B-Cell Cleanout Project.

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Janis Randal 8-18-99
Release Approval Date

Release Stamp

Approved For Public Release

**PROJECT IMPLEMENTATION PLAN:
ASTD REMOTE DEPLOYMENT**

*(Remote/Robotic Work Platform Procurement
for Large Hot Cell Deactivation)*

**D. W. Crass
August 1999**

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1.0 INTRODUCTION

This Project Implementation Plan (PIP) shall be the controlling document for the Accelerated Site Technology Deployment (ASTD) supported project to procure and qualify a remote/robotic work platform for large hot cell deactivation in the 324 Building B-Cell. This plan will be integrated into the *324/327 Buildings Stabilization/Deactivation Project, Project Management Plan*, (HNF-IP- 1289, Rev. 1) and shall comply with the base requirements established in that document. This PIP establishes the baseline and defines the scope, schedule, budget, organizational responsibilities, reporting requirements, deliverables, and end points for the implementation of new technology into B-Cell. This shall include procurement, safety, quality assurance, training, documentation, record management, and facility modifications applicable to this project.

Specifically this plan controls and executes the procurement and acceptance, qualification, and turnover of a remote/robotic work platform for 324 Building B-Cell. This includes the development of functional parameters, performance requirements, evaluation criteria, procurement specifications, acceptance and qualification test procedures, training requirements, and turnover responsibilities.

1.1 Purpose

The 324/237 Buildings Stabilization/Deactivation Project is currently in its second year of a nine-year project to complete deactivation and closure of the facility for long-term surveillance and maintenance. A major obstacles for the project is the inability to effectively perform deactivation tasks within high radioactively contaminated hot cells. The current strategies utilize inefficient and resource intensive technologies that significantly impact the cost and schedule for stabilization and deactivation. The ASTD Remote Deployment Project shall identify, procure, and turnover, to the B-Cell project, a remote/robot work platform to improve B-Cell cleanup productivity and enhance worker safety and health.

1.2 Facility Overview

The 324 Building was constructed as a Waste Technology Engineering Laboratory, containing Radiochemical Engineering Cells (REC) used for high-radiation, high-contamination chemical process development and demonstrations. B-Cell is in the largest REC, measuring 30½ feet (9.3 meters) high with a floor dimensions of 25 feet (7.6 meters) by 22 feet (6.7 meters). The cell was used for vitrification testing during its operation, with approximately 70 million total curies passing through the cell. Cell dose rates average 3000 R/hr (30 Gy/hr) with hot spots up to 10,000 R/hr (100 Gy/hr).

The B-Cell clean up effort includes removal of all excess equipment, fuel bundles, and all dispersible and adherent waste material. The cell will be decontaminated using mechanical and chemical techniques. The integrity and condition of the stainless steel liner will be determined, consistent with the *324 Building Radiochemical Engineering Cells, High Level Vault, Low Level Vault and Associated Areas Closure Plan*, DOE/RL-98-73, Rev. 1. Potentially the cell liner and contaminated underlying concrete may be removed.

1.3 Scope

Establish an ASTD Remote Deployment Project team integrated with the 324 Building B-cell Project to procure and turnover to B-Cell, a remote/robotic deactivation technology compatible with project goals and milestones. The technology will be capable of performing stabilization and deactivation activities that are commensurate with the B-Cell project needs at the time of deployment.

1.3.1 Technical Objective

Procure demonstrated off the shelf remote/robotic work platform in 324 Building B-Cell beginning fiscal year (FY) 2001. Functional and operational requirements will be developed by the B&W Hanford, Company (BWHC) ASTD Remote Deployment Project Team and supported by the existing B-Cell Safety Cleanup Project (BCCP). The remote/robotic work platform will possess full reach capability within B-Cell, will be capable of deploying several tools or end effectors to accelerate work tasks, and will eliminate the need for multiple specialized tool design and procurement. These activities could include such tasks as size reduction, debris collection and packaging, deployment of visual inspection systems, liner repair, and deployment of decontamination methods.

1.3.2 Schedule Objectives and Milestones

Objectives

• Issue Request for Proposal (RFP)	July 1999
• Award Contract	October 1999
• Fabrication/Assembly of System	November 1999 - July 2000
• Personnel Training and Qualification	January 2000 - September 2000
• Facility Preparations	July 1999 - August 2000
• Cold Testing and Evaluation	May 2000 - July 2000
• Low Radiation Testing (if necessary)	July 2000 - September 2000
• Turnover to B-Cell Project	September 29, 2000

ASTD Milestones (Reference: TTP RL09DD61)

Milestone 1- Finalize System Procurement Specification	June 30, 1999
Milestone 1A- Issue Second Request for Information (RFI)	July 30, 1999
Milestone 2- Issue Request for Proposal (RFP)	September 7, 1999
Milestone 3- Award Contract for Robotic Work Platform	October 15, 1999
Milestone 4- Accept Robotic Work Platform to Ship to Hanford	July 15, 2000
Milestone 5*- Complete Installation of Robotic Work Platform in the 324 Building	September 30, 2000

- * Milestone 5 will be completed by B-Cell Cleanout Project. Milestones 1 through 4 will be completed by the ASTD Remote Deployment Project.

1.3.3 Cost Objective

The total cost for the project is estimated to be over (See Section 2.4) \$4,048,900. ASTD funding for this project is \$1,544,800. The BCCP will provide \$2,504,400 in leveraged funds from its current baseline budget. Availability of this leveraged funding is based upon current project funding profiles.

ASTD (EM-50) funds finance the procurement of a remote/robotic platform. In addition ASTD funds support pre-deployment activities, personnel training, procedure development, acceptance testing, spare part procurement, and on-site operational testing as a prerequisite for turnover and in-cell deployment of the remote/robotic system by the B-Cell Project.

Leveraged funds from the BCCP will be used for pre-deployment activities, operator training, procedure development, maintenance training, and B-Cell modifications supporting installation of the work platform.

1.4 Deliverables

- Procurement specification - June 30, 1999
- Establish vendor selection list- July 30, 1999
- Issue RFP to selected vendors- September 7, 1999
- Contract Award- October 15, 1999
- Remote/robotic work platform delivered on site- July 14, 2000
- Turnover to B-Cell Project- September 29, 2000

Appendix A. identifies the performance measures established in the ASTD Deployment Plan, *Deploying a Robot Work Platform for Large Hot Cell Deactivation*, January 1999. These performance measures shall be considered project deliverables.

1.5 Project End Point

The ASTD Remote Deployment Project will deliver an operational qualified work platform for installation into B-Cell by September 29, 2000. The work platform will be installed and operated by the BCCP. The work platform shall be capable of performing deactivation activities that are commensurate with the B-Cell project schedule at the time of installation. The requirements and deactivation activities that the work platform shall be capable of performing will be defined, documented, and approved by the BCCP Manager. Acceptance of the work platform by the BCCP shall be considered the ASTD Project end point.

1.6 Project Turnover

Prior to delivery of the work platform on site, a project Turnover and Acceptance checklist will be developed and approved by the ASTD Remote Deployment Project Manager and the BCCP Manager. Appendix B serves as a guide for developing a project turnover and acceptance checklist. The Turnover and Acceptance checklist shall identify and track all relevant documentation, training, facility support, and facility modifications necessary to deploy the system into B-Cell. The checklist shall provide visibility of roles, responsibilities, and participation in the activities supporting turnover of the completed system. The checklist will

support project planning by providing a written agreement with the end user (B-Cell Safety Cleanup Project) of what constitutes the project end point deliverables and project closure and will support a smooth transition of ownership from the project to the end user.

The ASTD Remote Deployment Project shall be responsible for performing and validating final operational/qualification testing onsite prior to turnover to the BCCP.

2.0 PROJECT DESCRIPTION AND JUSTIFICATION

2.1 Project Description

The ASTD Remote Deployment Project will identify, procure, and turnover to the BCCP, a remote/robotic work platform in the 324 Building B-Cell. The project will develop a Request for Proposal (RFP) and procurement specification that will define the functional requirements, performance parameters, and evaluation criteria to deploy a work platform that is compatible with B-Cell operations and cleanup commitments.

The scope of the project shall include:

- Establishment and management of the baseline requirements
- Engineering studies related to the definition and development of system requirements
- Evaluation of available technologies
- Assure appropriate Quality Assurance Requirements are applied
- Acceptance and qualification test procedures and criteria
- Acceptance and qualification test reports
- Operating and training procedures
- Training of hot cell technicians, operators, and maintenance personnel
- Maintenance procedures
- Identification and procurement of spare parts
- Design and fabrication of mockup facilities
- Identification of B-Cell modifications related to the installation of the work platform
- Support B-Cell Project for installation and deployment activities

The ASTD Remote Deployment Project shall be responsible for identifying and procuring a remote/robotic work platform for the BCCP including vendor information, procedures, and other support data. The work platform shall be capable of performing two of the deactivation and decommissioning operations identified in the ASTD Deployment Plan, *Deploying a Robot Work Platform for Large Hot Cell Deactivation*, January 1999. The BCCP Project Manager will identify two technology needs commensurate with project goals and schedule opportunities at the time of delivery. These activities may include remote size reduction of remaining process equipment and systems, visual inspection of the interior cell liner, debris removal and packaging, decontamination of interior cell surfaces, and repair and potential removal of the cell liner.

2.2 Safety Class

A preliminary Hazards Safety Analysis will be conducted, based on the functions and requirements defined in the Remote Work Platform specification HNF-4640. The Hazards Safety Analysis will be documented in the project files. A preliminary Hazards Safety Analysis has identified the Work Platform as a general service system. Unreviewed Safety Question (USQ) screenings, evaluations, and other safety analyses will be performed as needed, to support procurement and installation.

2.3 Project Justification

The current mission of the 324/327 Buildings Stabilization/Deactivation Project is to accomplish the safe, cost effective, deactivation, using innovative technologies that eliminate or mitigate all building risks. The end result is a stable facility condition requiring minimal and low cost surveillance and maintenance.

Deactivation and clean up of the 324 Building B-Cell supports the U.S. Department of Energy (DOE) mortgages reduction goals. The Remote/Robot Work Platform being procured through the auspices of ASTD will accelerate B-Cell Project schedules, reduce cost and schedule impacts, and satisfy Hanford deactivation, decontamination and decommissioning project needs for the 324 Building. These needs have been identified in the:

- *Hanford Science and Technology Needs Statements* (DOE/RL-98-01, Revision 1),
- *324/327 Buildings Stabilization/Deactivation Project, Project Management Plan* (HNF-IP-1289, Rev.1),
- *324 Building Radiochemical Engineering Cells, High-Level Vault, Low-Level Vault, and Associated Areas Closure Plan* (DOE/RL-98-73, Rev. 1).
- TPA Milestones:
 - **M-89-00** Complete Closure of Non-permitted MW Units in the 324 REC, HLV and LLV. A completion date will be established immediately following Ecology approval of the REC, HLV and LLV closure plan (DOE/RL-96-73). Completion date is to be determined.
 - **M-89-02** Complete removal of the 324 Building B-Cell mixed waste and equipment, by November 30, 2000.

Current B-Cell deactivation and clean up actions are performed using master-slave manipulators and overhead bridge cranes. Manipulators mounted on the upper third of the cell wall can not reach the lower 8-10 feet (2.3-3 meters) of the walls and provide no access to the cell floor. The cranes provide floor access but deactivation activities and tasks are severely limited. Neither system allows access to the upper portion of the cell, cell liner, or ceiling.

Additionally, visibility is hampered by the limited light transmission through the thick lead glass windows and the large size of the hot cell. This problem has been partially solved using in-cell radiation hardened video cameras. However, the visual resolution is low and they do not allow viewing of all work areas.

Deployment of a remote/robotic work platform will have the potential to perform an array of deactivation tasks such as mechanical and chemical decontamination, equipment size reduction, visual inspection, cell liner integrity verification, cell liner repair and removal, and debris/dispersible collection. Considerable reductions in personnel radiation dose exposure and in the project cost and schedule will be realized by deploying this remote/robotic system. Table 1 provides an example of tooling and end effectors, which could potentially be deployed.

Table 1. Remote/Robotic Tooling and End Effectors

Impact wrenches	Pipe cutters	Chemical decon equipment
Hydraulic shears	Lights	Spraying gear
Electric circular saws	Plasma arc torch	Grinders
Electric reciprocating saws	Mechanical decon equipment	CO ₂ blast
Two or more mounted video cameras with integral lighting unit	Media blast equipment	Ultra-High Press water

Advantages for using a remote/robotic system are:

- Improved access to all areas of B-Cell.
- Visual access to all areas within the cell.
- Position or support additional camera and visual inspection equipment for specific deactivation activities.
- Reduce radiation exposures associated with manipulator removal, decontamination, and repair.
- Increased productivity.
- Increased equipment reliability.
- Adaptable/flexible system increases the capability to perform required deactivation and stabilization operations.

2.4 ASTD Support

The cost of this project to procure and deploy the remote/robotic system is estimated to be over \$4,048,900. Of this amount, EM-50 will fund \$1,544,800, primarily for the procurement of off the shelf technology to accelerate B-Cell deactivation activities. All of EM-50 funds dedicated to the project will be obligated in FY 1999 and FY 2000.

3.0 PROJECT ORGANIZATION

3.1 Organization

Appendix C ASTD Remote Deployment Project Organization

3.2 Roles and Responsibilities

Table 2 identifies the responsible personnel and the established points-of-contact for this ASTD project. The BWHC point of contact for this procurement of the remote/robotic system is J. W. Pratt. The manager responsible for the BCCP is J. G. Riddelle. The DOE Headquarters (HQ) point of contact is J. R. Duda.

Table 2. Responsible Persons and Points-of-Contact

DOE HQ	EM-50 ASTD Point of Contact	John R. Duda
DOE RL	Assistant Manager for Facility Transition (EM-60)	Peter M. Knollemeyer
	Assistant Manager for Science and Technology (EM-50)	Robert M. Rosselli
	ASTD Project Oversight	David C. Langstaff
	EM-50 D&D Liaison	Dennis A. Brown
Fluor Daniel Hanford, Inc.	Facility Stabilization Project Director (EM-60)	Larry J. Olguin
	Technology Management Oversight (EM-50/60)	Gregory T. Berlin
B&W Hanford Company	President and General Manager	Arthur Clark
	324/327 Buildings Stabilization/Deactivation Project Director	Jim M. Steffen
	B-Cell Safety Cleanup Project Manager	Jeffery G. Riddelle
	ASTD Project Integration Manager	Jeff Pratt
	300 Area Quality Assurance	Dave Sandoz
	Design Authority	Ernie J. Bitten
	Cog Engineer	Ernie J. Bitten

Table 3. Responsible Persons and Approval Authority

		Monthly program reviews	Quarterly ASTD Briefing	Final Report (15 Feb 02)	Request for Information	Procurement Specification/RFP	Award Contract	Fabrication oversight	Change Requests	BWHC Acceptance
DOE HQ	John R. Duda		I	I						
DOE RL	Peter M. Knollemeyer		I	A						
	Robert M. Rosselli		I	A						
	David C. Langstaff	I	A	A		I	I			
	Dennis A. Brown	I	I	I			I			
Fluor Daniel Hanford, Inc.	Larry J. Olguin		I	A			I			
Numatec Hanford Corp.	Gregory T. Berlin		R	R	I	R	R		I	I
B&W Hanford Company	Arthur Clark		I	A			I			
	Jim Steffen	I	A	A	I	A	A	I	I	I
	Jeffery G. Riddelle	A	A	A	A	A	A	A	A	A
	Jeff Pratt	A	A	A	A	A	A	A	A	
	Ernest J. Bitten	P	P	P	P	P	P	P	P	P
	Dave Sandoz			R	R	A		A	A	A

P = Prepare R = Review/comment A = Approve I = Information

3.3 Project Interfaces

The ASTD Remote Deployment Project is a subtier project of the 324 Building BCCP. As such the B-Cell Project Manager is responsible for integrating project activities into the BCCP Project baseline. The ASTD Remote Deployment Project PIP shall be released as a Hanford document and referenced in the *324/327 Buildings Stabilization/Deactivation Project, Project Management Plan*. This PIP shall provide the basis for a formal baseline change request for the B-Cell Safety Cleanup Project during the FY 2000 *Multi Year Work Plan* (MYWP) process.

Major participants in the ASTD Remote Deployment Project include the DOE HQ (EM-50 Division), RL (EM-60), BWHC and other Project Hanford Management Contract (PHMC) Major Subcontractors. The organizational relationships, roles and responsibilities of these major project participants are summarized in Tables 2 and 3 above.

In addition, the project will interface and coordinate activities with the following 324 Building facility organizations:

- 324 Building B-Cell Safety Cleanup Project
- Facility Operations
- Facility Maintenance
- Facility Engineering
- Facility Radiation Engineering and Protection
- BWHC Procurement
- Quality Assurance
- Project Controls
- Training
- Environmental

Interfacing organizations will commit to and provide the resources as identified in the project resource loaded schedule to assure successful integration of the remote/robot work platform into B-Cell.

3.4 Project Integration with B-Cell Project

The ASTD Remote Deployment Project is a subproject supporting the BCCP. The work platform will be procured to support 324 Building B-Cell cleanup activities and milestones. System requirements will be established to support existing BCCP tasks and commitments, and the BCCP Manager will have final approval of the RFP and procurement specification.

Programmatic and operational responsibilities for the remote/robot work platform is the jurisdiction of the BCCP and falls within the purview of the overall 324/327 Buildings Stabilization/ Deactivation Project. The 300 Area Facility Director for Stabilization/Deactivation provides direct programmatic ownership of the ASTD project. The sponsoring group provides programmatic integration and operations liaison support between the ASTD project and 324 Building projects. The ASTD Project team will provide day-to-day project management oversight and technical direction for the procurement and turnover of the remote/robot work platform.

Specific programmatic and project management responsibilities associated with the ASTD Remote Deployment Project include the following:

Programmatic Responsibilities (BCCP)

- Provide the technical baseline, and establish functional and operational requirements as they apply to B-Cell cleanup goals and commitments.

- Provide operations liaison between the project and facility personnel to minimize interface problems, promote integration, and facilitate project implementation. The BCCP shall provide operations liaison support and represent ASTD interests as they relate to the remote/robot work platform during upper level project reviews, meetings, and other activities.
- Provide programmatic, technical/engineering, operations, safety, environmental, health physics, and craft personnel, as required, to support procurement, testing, pre-installation activities, installation, and turnover of completed systems.
- Ensure timely exchange of information, data, records, and guidelines for special conditions/requirements that may impact project cost (e.g., functional and operational requirements, safety, QA, and training requirements, etc.) to the ASTD Project Manager.
- Participate and concur with final inspection and acceptance testing, and accept completed systems for operation.
- Support the development of operator procedures and training for operations and maintenance personnel, as required.
- Ensure integration of the ASTD Project with the 300 Area Stabilization Projects.

Project Management Responsibilities (ASTD Remote Deployment Project)

- Manage authorized project funds/resources, and approve project cost/schedule baselines.
- Provide for development, approval, and release of project documents.
- Provide technical direction to support the project technical baseline and safety basis for procurement.
- Provide technical/engineering personnel as required.
- Coordinate with BWHC Procurement
- Ensure vendor proposal and contract award is compliant with the project baselines, with consideration for safety, ALARA, quality, operability, maintainability, environmental compliance, and cost effectiveness factors. Provide contract technical approval. Involve the interfacing organizations in project development and reviews, as appropriate, and ensure documented closeout of all comments.
- Provide administration of the project baseline to assure appropriate management of scope, cost, and schedule commitments using the change control process. Approve all baseline changes.

- Act as a focal point to coordinate and integrate participating contractors and subcontractors for project activities. Provide appropriate direction to assure compliance with the project technical baseline and other technical design criteria.
- Provide project oversight to optimize the procurement in terms of quality, safety, cost, reliability, maintainability, life cycle costs, environmental requirements, accuracy, and assure compliance with applicable codes, standards, criteria, regulations, and DOE Orders
- Provide informational copies of project associated correspondence, reports, drawings, specifications, nonconformance reports, plans and schedules, cost estimates, QA records, audits, subcontracts, minutes, test procedures, photographs, etc., to other PHMC team members as required.
- Coordinate meetings and provide timely notification of meetings (with agenda when applicable), scheduled acceptance tests, and final inspections to participants and other appropriate parties.
- Prepare data input for monthly project reviews and reports, as required.
- Provide appropriate level of oversight for work performed by other contractors for the project.
- Coordinate installation, training, and testing activities with 324 Building personnel (Operations Person-In-Charge, Health Physics, Industrial Safety, etc.)
- Perform/document risk management activities.
- Provide technical support for vendor reviews, testing, training, and installation associated with the implementation of the work platform into B-Cell.
- Interface with EM-50.

4.0 PROJECT MANAGEMENT

4.1 Project Management and Control

The technical baseline defines the required functional, operational, and performance criteria to meet the project end point goals. The activities necessary to provide the end product shall be determined using the technical baseline. This scope of work is divided into elements that become the work breakdown structure (WBS) and are used as the basis for the cost and schedule baselines.

4.1.1 Work Breakdown Structure

The project WBS will be developed to provide a basis for scope definition, resource planning, and project control. The WBS will provide the flexibility to identify discrete project tasks and activities and the ability to link these together using schedule logic to reflect the planned order in which the actual work will be completed.

WBS dictionaries and basis of estimates prepared for the ASTD Remote Deployment Project will be formatted for inclusion into the BCCP schedule and the 324/327 Buildings Stabilization/Deactivation Project PMP. The dictionaries will include a summary-level statement of the technical scope, key milestones, key interfaces, and subproject assumptions. Lower-level WBS dictionaries can be developed at the discretion of the ASTD Project Manager.

4.1.2 Project Cost

The cost of this project to procure and deploy the remote/robotic system is estimated to be over \$4,048,900. Of this amount, EM-50 will fund \$1,544,800. The remainder (\$2,504,400) will be leveraged from of the BCCP baseline operating funds for the and cleanup and closure of B-Cell. Availability of this leveraged funding is based upon current project funding profiles. All of the EM-50 funds dedicated to the project will be obligated in FY 1999 and FY 2000. Table 4 shows the estimated project costs and funding source associated with this ASTD project.

Table 4. Project Costs and Funding (\$1,000s)

Cost Item	FY99	FY00	FY 01	Total Cost	Funding Source
Procurement					
Procurement of remote platform	1,100.0	0	0	1,100.0	ASTD
Training and procedure development	0	67.2	0	67.2	ASTD
	0	26.9	264.8	291.7	324 Project
Pre-Deployment					
Pre-deployment Activities	0	63.0	0	63.0	ASTD
	55.9	20.4	105.5	181.8	324 Project
Installation Activities	0	144.4	0	144.4	ASTD
	0	40.0	0	40.4	324 Project
Operational acceptance activities	0	68.0	0	68.0	ASTD
	0	45.0	0	45.0	324 Project
Procurement of spare parts	0	75.0	0	75.0	ASTD
	0	86.5	271.2	357.7	324 Project
Maintenance	0	27.2	0	27.2	ASTD
	0	15.3	200.8	216.1	324 Project
B-Cell Deployment					
Scheduled Opportunities	0	0	0	0	ASTD
Scheduled Opportunities	0	49.4	1,322.4	1,371.8	324 Project
Total Project Cost	1,155.9	728.3	2,164.7	4,048.9	
Total 324 Project Funding	53.9	283.5	2,164.7	2,504.4	
Total ASTD Funding	1,100.0	444.8	0	1,544.8	
324 Project Leveraging of Total Cost (%)					62

4.1.3 Project Schedule

The ASTD Project team will develop subproject schedules at a level that allows for providing performance measures and decision-making (i.e., inter- or intra-subproject prioritization). Schedule development and maintenance include assessing the impact of factors such as delays, equipment failures, procurement lead-time, productivity, resource availability and constraints, and facility availability. In addition, the project critical path will be identified and maintained on an on-going basis. Schedules will be statused monthly to effectively manage and integrate inter- and intra-subproject activities. The ASTD Project Manager will identify issues and concerns that may affect key milestones, performance agreements, and higher level deliverables; or affect the critical path of the project. Corrective action plans will be developed as required.

4.1.4 Resource Commitments

The 324/327 Buildings Stabilization/Deactivation Project Director shall assign and commit 324 Building and BCCP resources as identified in the project resource loaded schedule.

4.1.5 Project Risk/Quality Level Determination

The Primary assumptions established for this project plan are:

- Procurement cost (ASTD funds) will be adequate to procure a system that meets B-Cell closure goals.
- ASTD funding is received by April 1, 1999 and funding commitment remains at \$1,544,800.
- BCCP will receive the necessary resource and budget commitment to complete the project.
- BCCP schedules will remain consistent with the baseline established in this PIP.
- The 324/327 Buildings Stabilization/Deactivation Project Director shall assign and commit 324 Building and BCCP resources as identified in the project resource loaded schedule.
- Estimated ASTD and BCCP funding is adequate for procuring and supporting pre-deployment activities at a level appropriate for the technology/robot.

Project risk for the ASTD Remote Deployment Project has been identified as:

- Procurement cost (ASTD funding) was estimated on incomplete functional and performance requirements.
- Original ASTD proposal was submitted for a crane deployed two arm robotic system. Commercial technology may not be available to meet project goals.

The Quality Level established for the procurement of the Remote/Robot Work Platform is QL-3. The determination for QL is based on an evaluation of the BCCP risk associated with the procurement, installation, and deployment of the Work Platform and the completed

Hazards Analysis checklist in accordance with HNF-PRO-704. The risk to the BCCP caused by delays in deployment or failure of the equipment is considered to be low. Justification for this determination is:

Project schedule- the BCCP baseline schedule is based on current methods and equipment for completing B-Cell project goals. The deployment of the Work Platform will accelerate the project schedule. Delay of the procurement, deployment or failure of the system will not impact the current BCCP baseline.

Project cost- the BCCP baseline cost is based on current methods and equipment for completing B-Cell project goals. Current baseline estimates include funding for multiple equipment development, testing, and deployment to complete baseline activities. Procurement of the Work Platform will reduce or eliminate the need to develop multiple tools and support equipment. Delay of the procurement, deployment or failure of the system will not impact the current BCCP baseline.

Safety- failure or delay of deployment will not impact the safety of the facility or critical support systems. Failure or delay of the deployment will not effect worker safety or health. Failure or delay of the deployment will not affect public safety or health. Failure or delay of deployment will not impact the environment.

A Safety Hazards Analysis has determined that deployment of the system will not effect safety class SSCs within the 324 building. A determination, based on the Safety Hazards Analysis has classified the Work Platform as General Service.

The Cognizant Engineer and the Cognizant QA Engineer concluded that the Quality Level be elevated to QL3 due to the high visibility nature of the ASTD procurement and the desire to establish specific Quality Requirements such as hold points, vendor Quality Program verification, and inspections.

4.1.6 Procurement Management

Procurement management shall be performed in accordance with site Major Subcontractor procedures to ensure all practices are in compliance with Federal Acquisition Regulations (FAR). The ASTD Remote/Robotic Work Platform will be procured in accordance with requirements for procuring commercial items as specified in FAR part 12.

Procurement of the Remote/Robot Work Platform will be a two step procurement process

- solicitation of technically qualified vendors through a RFI
- Issuing a RFP for competitive bid.

The procurement strategy followed by the ASTD Deployment Project will:

- Identify potential vendors and issue a RFI.
- Finalize a performance based procurement specification.
- Issue a second RFI to selected technically qualified vendors
- Establish a Technical Evaluation Team.

- Solicit interested vendors to attend a one-on-one meeting to:
 - Perform market research
 - Discuss specification requirements
 - Ensure the vendor fully understands the specification and project requirements
 - Discuss vendors proposal
- Evaluate proposals and concepts with respect to:
 - Vendor technical capability
 - Ability to meet the specification requirements
- Finalize specification based on vendor discussions.
- Issue RFP to qualified vendors for competitive bid. (minimum of two)
- Award contract

Table 3 identifies the responsible persons and approval authority for procurement related documentation.

Issuing a finalized performance specification as a second RFI will allow the ASTD project team to perform a comprehensive market search and interact with selected vendors via a one-on-one technology exchange. After issuing the second RFI, meetings will be scheduled with individual vendors. Solicitation of vendors to participate in one-on-one meetings will allow the project team to clarify project and technical requirements. Potentially the specification may be revised based on vendor input and capabilities of current commercially available technology. A Technical Evaluation Team will be established by the project to conduct meetings with solicited vendors. The team will consist of QA, B-Cell Project, technical, and procurement personnel. Upon completion of each formal vendor meeting the Evaluation Team will perform a technical evaluation of the vendor. After all vendors have been interviewed the Evaluation Team will prepare a "short list" of vendors to be issued a RFP. Proposals submitted in response to the RFP will be evaluated for price and technical accuracy, and a vendor selected for the procurement. The evaluation will be documented in the project files.

Technical evaluation criteria will be developed prior to conducting vendor interviews. The evaluation criteria will be based on the requirements established in the procurement specification and will include, technical design (capability to meet the performance parameters identified in the procurement specification), quality assurance, schedule, vendor experience and capability, and the vendor's ability to provide training and technical support. Vendor provided technical support, both before and after deployment of the system, is an essential aspect of this procurement. The objective of this procurement strategy will be to establish a successful working relationship with the vendor.

4.1.7 Change Control

Baseline change control will be administered in accordance with Hanford Site procedure HNF-PRO-533. Responsibilities and requirements for management, administration, and use of the technical, schedule, and cost baseline control system will be implemented in accordance with HNF-PRO-533.

4.1.7.1 Cost and Schedule Change Control

Estimates for the total project cost have been developed and presented in the ASTD Deployment Plan (January 1999). This includes both the ASTD supported funds and the BCCP leveraged funds. The project baseline will be established using a detailed resource loaded schedule and will be documented through the MYWP.

Justification for change will be submitted through a Baseline Change Request (BCR). The ASTD Integrated Project Manager and the BCCP Project Manager must approve all baseline changes. Specific baseline change control requirements shall be managed in accordance with BWHC change control guidelines and specific requirements established for the 324/327 Building Stabilization/Deactivation Project and the BCCP.

4.1.7.2 Technical Baseline Change Control

The technical baseline will be established during the procurement phase of the project and will be defined by the procurement specification for the remote/robotic platform. The specification will identify the :

- Technical specifications
- Functional requirements
- Operational requirements
- Safety/ALARA requirements
- Performance requirements
- Decontamination requirements
- Maintenance requirements
- Quality Assurance requirements

Changes to the technical and cost/schedule baselines will be controlled through an Engineering Change Notice (ECN) and BCR. Changes to the technical baseline will be reviewed and approved by the BCCP Project Manager and ASTD Remote Deployment Project Manager.

4.2 Information and Reporting

4.2.1 Project Status

The ASTD Remote Deployment Project Manager will report on technical issues, resolution, accomplishments, schedule, performance, and cost monthly. Schedule status will be assessed based on earned value. The ASTD Remote Deployment Project Manager will determine the status of work completed in the past month and work in progress, and identify work scheduled the following month. Variance reports will be issued for each reporting period, which identify cost and schedule performance, accomplishments, technical issues, and resolution.

An estimate at completion (EAC) will be developed, beginning no later than July 1999, for the current fiscal year activities and project life-cycle activities. The EAC will be based on detailed analysis of performance data and variances, and relevant changes to the baseline. Development of the EAC should be an ongoing process, with updated information provided through monthly status.

4.2.2. Reporting

The project team's monthly report shall be a progress report that includes the cost performance, milestone schedule status, variance analysis, and issues. The report will be presented monthly to the BCCP Project Manager and ASTD Remote Deployment Project Manager.

In addition, project status will be reported monthly to EM-50 through the Progress Tracking System (PTS). The PTS report will summarize performance and compare it with the technical, schedule, and cost baselines.

4.2.3 ASTD Reviews

Throughout the project, BWHC will provide regular (typically quarterly, scheduled by RL) EM-50 ASTD program management review meetings. The appropriate personnel from DOE-HQ, RL, FDH and BWHC will attend the meetings. These meetings will be held at the ASTD project site in Richland, Washington, or via telecom.

BWHC will be responsible for preparing and issuing the agenda and recording action items, agreements, and commitments that result from the meeting. Quarterly reviews will focus on significant accomplishments, expected accomplishment for the next quarter; major problems and issues facing the project; and current cost, schedule, and technical status.

As required, the ASTD Remote Deployment Project Manager shall represent BWHC to support FDH and RL to conduct special-topic project meetings to review progress, identify issues and action items requiring management decisions, change actions, and other items as necessary.

4.2.4 Reviews

BWHC and RL will conduct a monthly project status review. The review will focus on significant accomplishments since the last review; expected accomplishments for the next quarter; major problems and issues facing the project; and current cost, schedule, and technical status.

The monthly meeting will also focus specifically on tracking the progress and future potential deployment opportunities. Specific requirements, constraints or criteria previously identified by the future deployment sites' representatives will be discussed and results/resolutions provided, as they become available.

5.0 PROJECT BASELINE

The final baseline for the ASTD Remote Deployment Project will be developed during the FY 2000 MYWP process.

5.1 Project Detailed Schedule

Will be developed during the FY 2000 MYWP and/or Formal Baseline Change Request process.

5.1.1 Summary Schedule

See Appendix D

5.1.2 Critical Path Schedule

Will be developed during the FY 2000 MYWP and/or Formal Baseline Change Request process.

5.1.3 Detailed Schedule

Will be developed during the FY 2000 MYWP and/or Formal Baseline Change Request process.

5.2 Project Resources

Will be developed during the FY 2000 MYWP and/or Formal Baseline Change Request process.

5.3 Project Cost Detail

Will be developed during the FY 2000 MYWP and/or Formal Baseline Change Request process.

6.0 TRAINING

The ASTD Remote Deployment Project shall use existing BCCP requirements and procedures to establish training qualifications. The Project shall assure that documented and approved training and qualification procedures are provided to BCCP prior to commencement of work platform operations. 324 Hot Cell Operations shall assure that all operators and shift supervisors are offered training to perform assigned tasks in a manner that minimizes personnel risk and minimizes impacts to the public, the environment; and the building and associated equipment.

7.0 QUALITY ASSURANCE

The ASTD Remote Deployment Project is a subproject of the BCCP. As such, it will be bound by the Quality Assurance requirements established in HNF-IP-1264 Section 8.1, Rev. 0, Project Quality Assurance Program Plan (QAPP). The QAPP is a supplement to, and must be used in conjunction with the BWHC Facility Stabilization Project QAPP, FSP-MP-004.

HNF-IP-1264, Rev. 0 applies to all Project quality-affecting activities governed by the PHMC Quality Assurance Program Description (QAPD), HNF-MP-599, that affect, or potentially affect, quality-related items.

The 300 Area Project Quality Assurance organization shall be responsible for:

- Interpreting and invoking QA requirements through HNF-IP-1264, Rev. 0, and Project- specific implementing documents.
- Reviewing and approving documents (e.g., design documents, procurement documents, and procedures.)
- Overview, assessing, and verifying compliance with applicable QA requirements.
- Support inspection and acceptance testing to verify quality.
- Assisting the Project to establish and maintain procedures for implementing applicable QA requirements.

The Project shall comply with PHMC and BWHC procedures that implement applicable QA Requirements identified in the "QAPD Project Implementation Matrix in 8.1 and BWHC Implementation Matrix in FSP-004. Work shall be stopped per HNF-MD-035, "Shutdown and Stop-Work Direction", for conditions adverse to Quality.

The QA Program requirements shall be selected and applied to specific Project activities and items using a graded approach. The graded approach shall be implemented by assigning the appropriate safety classification (SS, SC, GS, or NA) of items and activities based upon the criteria established in HNF-IP-1264 Section 8.1, Rev. 0.

Noncompliance with applicable QA requirements, when discovered through assessments, investigations of events, or other means, shall be identified and reported in accordance with HNF-IP-1264, Sections 2.22 and 2.6.

APPENDIX A PERFORMANCE MEASURES

Performance Measures Tracking Table

Task/Activity	Performance Measure	Scheduled Completion	Actual Performance (to be completed during deployment of the project)	Actual Completion
Procure a remote/robotic system	Complete vendor qualifications and delivery of demonstrated, commercially available remote/robotic work platform, including all ancillary equipment and infrastructure.	April 2000		
Satisfy facility requirements for deactivation and support baseline project activities	Perform activities and tasks currently identified in the 324 Building B-Cell baseline schedule.	December 2002		
Minimize personnel exposure to nuclear/radioactive hazards	Reduce the number of airlock entries associated with the repair of the overhead cranes and master-slave manipulators. Provide a reliable remote/robotic system that can support airlock activities.			
Provide full cell accessibility	Install remote work platform in building 324 Building B-Cell. Operate the system to demonstrate reach capability provides full access the in-cell stainless steel liner.	July 2000		
Deployment of the remote/robotic work platform in 324 Building B-Cell will demonstrate and perform two of the following facility stabilization tasks in cell. The two tasks will be determined by project needs based on current schedule status at the time of deployment. The remainder of the stabilization tasks will be performed commensurate with project baseline schedules under the deployment phase of this proposal.				
Size reduction	Install the work platform in building 324 Building B-Cell. Demonstrate size reduction capability utilizing specialty end effectors or end effectors that accommodate current cell methods such as plasma arc torch or circular grinders.	TBD		
Mechanical Decontamination	Install the work platform in building 324 Building B-Cell. Demonstrate mechanical decontamination capability utilizing specialty end effectors or end effectors that accommodate current cell methods or specialized decontamination systems provided by the B-Cell project.	TBD		
Chemical Decontamination	Install the work platform in building 324 Building B-Cell. Demonstrate chemical decontamination capability utilizing specialty end effectors, or end effectors, which accommodate current, cell methods or specialized decontamination systems provided by the B-Cell project.	TBD		
Visual inspection	Install the work platform in building 324 Building B-Cell. Demonstrate visual inspection capability utilizing specialty end effectors and visual systems or end effectors that accommodate commercially available visual systems.	TBD		
Liner repair	Install the work platform in building 324 Building B-Cell. Demonstrate liner cutting, size reduction and removal capability utilizing specialty end effectors or end effectors which accommodate current cell methods such as plasma arc torch or circular grinders.	TBD		
Debris/Dispersible removal	Install the work platform in building 324 Building B-Cell. Demonstrate size reduction capability utilizing specialty end effectors or end effectors which accommodate current cell methods such as plasma arc torch or circular grinders	TBD		
Show that the technology is suitable for other deployment for future 324 Building Project activities, as a minimum the deactivation of the High-Level Vault (HLV) and D-Cell. The actual use of the remote/robotic system in these areas will be accomplished during the Deployment Phase of this ASTD				

APPENDIX B CHECKLIST FOR PROJECT TURNOVER AND ACCEPTANCE

Program/Project Title:

Checklist for Project Turnover and Acceptance			
DESCRIPTION	RESPONSIBILITY	DESCRIPTION	RESPONSIBILITY
ENGINEERING ☐ Engineering Task Plan ☐ Activity Schedule ☐ Final Safety Analysis Report ☐ Interim Safety Basis - update ☐ Safety Assessment ☐ Safety Equipment List ☐ Operational Safety Requirements - or update existing ☐ Operational Safety Document(s) - or update existing ☐ Design Criteria ☐ System Design Description ☐ Test Plan/Specifications ☐ Acceptance Test Procedures and Final Test Report ☐ Operational Test Procedures and Final Test Report ☐ Environmental Impact Statement ☐ Environmental Report ☐ Environmental Permit ☐ Hazardous Waste Disposal Plan/Procedures ☐ Solid Waste Disposal Plan/Procedure ☐ Stress/Seismic Analysis ☐ Stress/Design Report ☐ Design Specifications/Report ☐ Equipment Specifications ☐ Procurement Specifications ☐ Construction Specification ☐ Essential Material Specifications ☐ Final Design Drawings ☐ Installation Drawings ☐ Installation Work Plan ☐ As-built Drawings ☐ Interface Control Drawings ☐ IEFD Drawings ☐ Systems Drawings ☐ Drawing Tree ☐ Incorporate Outstanding Project Generated ECNs ☐ _____		ADP ☐ Software Configuration Mgmt Plan ☐ System Requirements Spec ☐ Software Design Description ☐ Software Validation/Verification ☐ _____ TRAINING ☐ Training Plan ☐ Training Manuals ☐ Training to Operating Crews ☐ Training to Maintenance Crews ☐ Training Mock-Up ☐ _____ OPERATIONS/MAINTENANCE ☐ Operating and Maintenance Manuals ☐ Operating Procedures ☐ Surveillance Procedures ☐ Calibration Procedures ☐ Preventative Maintenance Proc. ☐ Repair/Maintenance Procedures ☐ Functional Check Procedures ☐ PM/S Datasheets ☐ Final Joint Safety walkdown by Operations, Engineering, maintenance, and Health Physics Technicians, as appropriate. ☐ _____ ☐ _____ QUALITY ASSURANCE ☐ Inspection Plan ☐ QAPP ☐ QAP:P ☐ _____ PROCUREMENT ☐ Vendor Information Files ☐ Comprehensive Equip. List ☐ Spare Parts List ☐ Spare Parts in Stock ☐ _____	

APPENDIX C ASTD REMOTE DEPLOYMENT PROJECT ORGANIZATION

ASTD IMPLEMENTATION PROJECT ORGANIZATION CHART

APPENDIX D SCHEDULE

Activity ID	Activity Description	Orig Sched	Sched Start	Sched Finish
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Project Management & Integration	R11000 Submit ASTD Robotics Deployment Plan	0	01FEB99*	01FEB99*	◆
	R11005 Project Management and Integration FY99	169	01FEB99*	30SEP99	
	R11010 Project Scheduling and Controls FY99	169	01FEB99	30SEP99	
	R11015 Develop Project Implementation Plan (PIP)	43	16FEB99*	15APR99	
	R11020 Release PIP as HNF Document	0	30AUG99*		◆
	R11025 Project Management and Integration FY00	251	01OCT99	29SEP00	
	R11030 Project Scheduling and Controls FY00	251	01OCT99	29SEP00	
	R11035 Project Management and Integration FY01	251	02OCT00	28SEP01	
	R11040 Project Scheduling and Controls FY01	251	02OCT00	28SEP01	
	R11045 Project Management and Integration FY02	94	01OCT01*	15FEB02	
Project Reporting	R12000 Perform Monthly PM Progress Reporting FY99	169	01FEB99	30SEP99	
	R12005 Perform Quarterly EM-50 ASTD Review Meeting FY99	169	01FEB99	30SEP99	
	R12010 Perform Monthly PM Progress Reporting FY00	251	01OCT99	29SEP00	
	R12015 Perform Quarterly EM-50 ASTD Review Meeting FY00	251	01OCT99	29SEP00	
	R12020 Perform Monthly PM Progress Reporting FY01	251	02OCT00	28SEP01	
	R12025 Perform Quarterly EM-50 ASTD Review Meeting FY01	251	02OCT00	28SEP01	
	R12030 Perform Monthly PM Progress Reporting FY02	94	01OCT01*	15FEB02	
	R12035 Perform Quarterly EM-50 ASTD Review Meeting FY02	94	01OCT01*	15FEB02	
	R12040 Submit Final Report to ASTD (DOE-HQ)	0	15FEB02*		
	Procurement				
Award Contract	R21000 Develop Preliminary Requirements Document	30	01FEB99*	15MAR99	
	R21005 Develop Request for Information (RFI)	20	16FEB99	15MAR99	
	R21010 Issue RFI	0	15MAR99		
	R21018 Develop Request for Proposal (RFP)	56	16MAR99	02JUN99	
	B-Cell Robotics Deployment Schedule				
Project Management & Integration	ROBD				
	<div> <div>Early Bar</div> <div>Progress Bar</div> <div>Critical Activity</div> </div>				
	<div> <div>01OCT97</div> <div>15FEB02</div> <div>01OCT98</div> <div>12AUG99</div> </div>				
	<div> <div>Project Start</div> <div>Project Finish</div> <div>Data Date</div> <div>Run Date</div> </div>				
	© Primavera Systems, Inc.				
	B-Cell Robotics Deployment Schedule				
	<div> <div>Sheet 1 of 4</div> <div> <div>BWX</div> <div>TECHNOLOGIES</div> </div> </div>				
	<div> <div>B&W Hanford Company</div> <div>a McDermott company</div> </div>				
	29				

Activity ID	Activity Description	Orig Dur	Sched Start	Sched Finish	FY99					FY00					FY01					FY02									
					F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F
R31005	Develop Training Qual Cards	49	11APR00	19JUN00																									
R31040	Prepare QPP Documentation	60	01MAY00	26JUL00																									
R31015	Perform Classroom Training	24	16MAY00	19JUN00																									
R31020	Perform On-the-Job Training	23	27JUN00	31JUL00																									
R31025	Complete Performance Demonstrations	24	18JUL00	18AUG00																									
R31035	Perform QPP	10	27JUL00	09AUG00																									
R31030	Complete Final Checkout on Qual Cards	9	08AUG00	18AUG00																									
R31045	Facility Declare Readiness	0		18AUG00*																									
B-Cell Modifications																													
R32000	Modify Crane Mount (Including JCS WPs)	135	04JAN00*	14JUL00																									
R32010	Install Docking Stations (Including JCS WPs)	135	04JAN00*	14JUL00																									
R32015	Perform Other REC & Gallery Mods(Inclg JCS WPs)	135	04JAN00*	14JUL00																									
R32030	B-Cell Modifications Complete	0		14JUL00																									
System Installation																													
R42000	Procure/Maintain Spare Parts FY00	106	01MAY00	29SEP00																									
R33010	Install Robot/Console/Operating Stations (Inc JCS)	30	18AUG00	29SEP00																									
R33015	Perform 2 A/L Entries for Installation Activities	30	18AUG00	29SEP00																									
R33025	System Installation Complete	0		29SEP00																									
R33030	Commence Operations/Deployment in B-Cell	0		29SEP00																									
R33035	ASTD Mstn 5 - Complete Installation in B-Cell	0		29SEP00*																									
R42010	Procure/Maintain Spare Parts FY01	230	02OCT00	29AUG01																									
Deployment																													
Scheduled Opportunities																													
R41000	Assess Hot Ops for Compliance with Procs/Traing	15	02OCT00	20OCT00																									
R41005	Perform B-Cell Scheduled Opportunity #1	230	02OCT00	29AUG01																									
R41015	Perform B-Cell Scheduled Opportunity #2	230	02OCT00	29AUG01																									
R41020	Deploy Two Technologies	0		31DEC01*																									
Robotics Maintenance/Repair																													
R42005	Perform Preventive/Corrective/Emerging Maint	230	02OCT00	29AUG01																									
Future Deployment																													
R43000	Management Negotiations for Future Deployment	112	19JUL01	31DEC01																									
R43010	Technology Ready for Future Deployment	0		31DEC01																									