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RCT-PXP-026

Revision 0

Project Execution Plan for the Development and Deployment of a High Energy RTR System

EFFECTIVE DATE: 09/30/2009

[redacted]

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	09/30/2009	Initial issue.

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LIST OF ATTACHMENTS

1.0 PROJECT OVERVIEW

1.1 Background

The Waste Isolation Pilot Plant (WIPP) is the cornerstone of the U.S. Department of Energy's (DOE) nuclear waste cleanup effort. The WIPP is designed to permanently dispose of transuranic (TRU) radioactive waste left from the research and production of nuclear weapons. Located in southeastern New Mexico, 32 miles east of Carlsbad, the project facilities include disposal rooms excavated in an ancient and stable salt formation 2,150 feet underground. TRU waste consists of clothing, tools, rags, and other disposal items contaminated with trace amounts of radioactive elements, including plutonium. Washington TRU Solutions, LLC (WTS) is the managing and operating contractor for the DOE/Carlsbad Field Office (CBFO) at the WIPP.

The Central Characterization Project (CCP) is a department within WTS that characterizes and certifies TRU waste at DOE generator sites around the United States. To support the TRU waste characterization program a need for a high energy real-time-radiography (RTR) unit capable of x-raying boxes containing high density waste has been identified.

Currently, high density waste is being packaged in boxes from the Plutonium Finishing Plant (PFP) at Hanford. The waste being generated from this cleanup effort includes large steel and stainless-steel tubes and glovebox components. To characterize and certify this waste, Visual Examination (VE) or RTR is required. The effort to perform VE on this waste stream would require approximately 45 people and cost an estimated [redacted]. This effort would also put the approximate 45 people in potential high radiation/contamination areas day in and day out. The current schedule for completion of the PFP decontamination and decommissioning (D&D) effort is to be at grade by March 2013. The effort to perform RTR on the same volume of this waste stream would require approximately three people and cost an estimated 300,000 per year after the initial cost of the RTR unit. For the RTR operations, the employees would not be exposed to the high radiation/contamination areas utilizing as low as reasonable achievable (ALARA) principles.

1.2 Purpose

The purpose of this project is to develop and deploy a mobile high energy RTR unit that is capable of characterizing and certifying high density waste. It is anticipated that the RTR unit will be used to x-ray waste containers up to a standard waste box (SWB). This effort is in support of

the PFP D&D at Hanford. For that reason, it is a high priority, accelerated project.

1.3 Scope

The scope of this project includes the following main elements:

1. **Project Administration** – development and maintenance of this Project Execution Plan (PXP), initiation of a Program Change Request to secure funding, project controls, project management, and communications.

2. **Quality Assurance** – grade the item, perform qualified suppliers list (QSL) request as appropriate, and work with WTS Quality Assurance (QA) oversight programs to perform inspections.

3. **Development** – design, fabricate, and test the high energy RTR unit under Purchase Order with [redacted]

4. **Deployment** – deploy the high energy RTR unit under Master Task Order (MTO) 403916 with [redacted] develop operation procedures, and begin to work toward initial certification.

5. **Property** – make arrangements to have equipment tagged with WTS property tag and assign the equipment to WTS owner. Make arrangements for the item to be received in Integrated Financial Management Systems (IFMS).

6. **Documented Safety Analysis** (DSA) – perform Unreviewed Safety Question (USQ) Determination and if required, obtain necessary DOE regulatory DSA-related approvals for the deployment of the high energy RTR unit at Hanford.

7. **Health and Safety Plan** (HSP) – identify the hazards associated with operation of the high energy RTR unit, perform an associated hazards analysis, and develop hazard controls; address both CCP and Host site Health and Safety Plans.

8. **Certification** – perform certification audits for the high energy RTR unit.

9. **Configuration Management** (CM) – enter the high energy RTR unit into the WTS property system and set up a CM file, control software associated with the system under CCP-QP-022, *CCP Software Quality Assurance Plan,* develop an equipment description and maintenance

requirements per CCP-TP-140, *CCP Equipment Maintenance,* manage any changes to the equipment after initial acceptance under CCP-CM-001, *CCP Equipment Change Authorization and Documentation*.

1.4 Priority

This project is to be given a priority to support the PFP D&D effort at Hanford. The goal is to begin the deployment of the high energy RTR unit in April of 2010.

2.0 CONTRACT OVERVIEW

The project will consist of two phases; development and testing, and deployment. The development and testing phase will be managed and controlled under a Purchase Order with [redacted] The deployment phase will be managed and controlled as a task under MTO 403916 with [redacted]

3.0 PROJECT ORGANIZATION AND RESOURCES

The development and deployment of the high energy RTR system will be executed by a variety of resources. The following individuals are assigned to this project:

- Overall Project Lead, [redacted]
  - Project Controls and Scheduling, [redacted]
  - Site Technical Representative (STR) for Purchase Order with VJ Technologies, [redacted]
  - STR for MTO 403916 with MCS, [redacted]
  - Technical Support, [redacted]
  - Technical Support and Hanford Interface, [redacted]
  - CCP Configuration Management, [redacted]
  - Property, [redacted]
  - CCP Health and Safety, [redacted]
  - CCP Quality Assurance, [redacted]

- WTS WIPP Site Quality Assurance, [redacted] and [redacted]
- CCP Document Services, [redacted]
- Procurement Coordinator, [redacted]

Authorization Basis and Safety issues will be managed in accordance with Hanford Memorandum of Agreement (MOA) and the Hanford Interface agreement.

As the project moves forward, and in accordance with scheduling and budget constraints, other individuals may be assigned as appropriate.

[redacted] WTS Manager of Retrieval, Characterization and Transportation, is the Cost Account Manager (CAM) for this activity and is the WTS management sponsor for this project. The DOE Carlsbad Field Office point of contact for this project is [redacted]

4.0 PROJECT ADMINISTRATION

This project will be managed through a disciplined process in accordance with this PXP and the application of disciplined Project Controls.

5.0 PROJECT BUDGET AND SCHEDULE

5.1 Activities

The estimated budget and schedule for the key elements are based on the following activities:

5.1.1 Project Administration

- Develop and maintain PXP.
- Apply project controls and scheduling discipline for duration of project.
- Coordinate and manage work activities for duration of project.
- Ensure that key assumptions and requirements are established and agreed to early on, and kept up-to-date for the duration of the project; an early on, thorough, and complete definition of the source term to be accommodated is considered to be critical to project success.

5.1.2 Quality Assurance (QA)

- Maintain QA throughout the course of this project including; Grading, QSL Request, Inspections.
- QA Inspection Plan will be developed once design has been reviewed and approved by WTS.
- QA requirements during deployment to be determined.

5.1.3 Development

- Develop procurement package for the high energy RTR unit that includes; Grading, Statement of Work (SOW), Approval Request/Variation Request (AR/VR) Transmittal Register, and Sole Source Justification (SSJ) issue a Purchase Order with [redacted]

  Manage the design, fabrication, and testing of the high energy RTR unit under a Purchase Order with [redacted] in accordance with WTS approved procedures.

5.1.4 Deployment

- Issue Change Notice to MTO 403916 with [redacted] to deploy and operate the high energy RTR unit at Hanford.
- Develop operating procedures for new piece of equipment, and begin to work toward initial certification.
- Coordinate with Hanford to site the high energy RTR unit upon arrival.
- Transport high energy RTR unit to Hanford

5.1.5 Property

- Work with WTS Property Management to have the equipment tagged and entered into the WTS property database system.
- Assign the equipment to a WTS owner preferably someone at the site where the equipment is deployed.

5.1.6 Documented Safety Analysis

- Based upon final design specs of the high energy RTR unit, evaluate impacts, if any, related to the deployment of the unit at Hanford.
- Perform Unreviewed Safety Question Determination (USQD) at Hanford and prepare required documents to amend existing DSA if necessary.
- Secure DOE approval of any DSA changes related to the addition of the high energy RTR unit, if required.

5.1.7 Health and Safety Plan

- Identify the hazards associated with operation of the high energy RTR unit.
- Perform hazards analysis.
- Develop hazards controls.
- Address both CCP and Host site Health and Safety Plans.

5.1.8 Certification

- Demonstrate readiness to operate the high energy RTR unit.
- Start operations of the high energy RTR unit at Hanford.

5.1.9 Configuration Management

- Assign a unique number to the high energy RTR unit to enter it into the CCP Configuration Management program.
- Enter the high energy RTR unit into the WTS property system.
- Control any software associated with the high energy RTR unit under CCP-QP-022.
- Develop a CCP equipment description and establish maintenance requirements per CCP-TP-140.
- Manage/Control any changes to the equipment after initial acceptance under CCP-CM-001.

5.2 Budget

This project consists of two phases. Phase 1 is the development and phase 2 is the deployment of the high energy RTR unit. A budget estimate for the development (phase 1) of the high energy RTR unit is included in this PXP. A budget estimate for the deployment (phase 2) is still to be determined and will be provided later.

The budget estimate for the development of the high energy RTR unit including material and labor costs is provided below, with a total development budget (excluding tax) of [redacted]

Materials			Material Cost
Dual Energy Linear Accelerator and Components			[redacted]
Digital Detector XRD1621			[redacted]
Detector Collimator			[redacted]
Computer Equipment			[redacted]
Box Manipulator/Cart			[redacted]
Linear Accelerator Manipulator			[redacted]
Detector Manipulator			[redacted]
Re-locatable Sheild Vault			[redacted]
Re-locatable Control Room			[redacted]
		Material Total:	[redacted]
Labor	cost/hr	hours	**Labor Cost**
Project Management			
Administration	[redacted]	480	[redacted]
PM	[redacted]	960	[redacted]
QA	[redacted]	720	[redacted]
		Total:	[redacted]
Engineering			
Senior Engineer	[redacted]	720	[redacted]
Junior Engineer	[redacted]	960	[redacted]
QC	[redacted]	720	[redacted]
		Total:	[redacted]
Software			
Development	[redacted]	3375	[redacted]
Maintenance	[redacted]	960	[redacted]
		Total:	[redacted]
Production			
Fabrication	[redacted]	800	[redacted]
Assembly	[redacted]	800	[redacted]
		Total:	[redacted]
		Labor Total:	[redacted]
	cost/day	days	
High Energy Laboratory Usage	[redacted]	20	[redacted]
		Project Total	[redacted]

5.3 Schedule

This project was initiated July 2009. Schedule is driven by the desired completion milestone of deployment of the high energy RTR unit in April 2010. A tentative schedule has been developed and will be maintained through Project Controls. Attachment A, High Energy RTR Development and Deployment Schedule, shows the major elements of the project and key milestones leading to the deployment in April 2010. A schedule for the design, fabrication/assembly, and testing of the unit is listed as a deliverable in the Purchase Order with [redacted] The scheduled completion and delivery date of the High Energy RTR Unit is April 9, 2010.

6.0 PROJECT PRIORITY

The development and deployment of the high energy RTR unit is to support the PFP D&D effort at Hanford. It will require management priority to ensure a dedicated effort for the procurement of the design, fabrication, and testing through the deployment of the high energy RTR unit, and continued management commitment through the duration of the project.

7.0 UNIQUE PROJECT CONSIDERATIONS

The goal of this project is to develop and deploy a high energy RTR unit to support Hanford's PFP D&D efforts and to support the 30/5 Shipping Schedule.

7.1 High Energy RTR Unit Design Goal

The design goal of this project is the development a high energy RTR unit with the following features:

- A modular re-locatable or mobile unit similar to CCP's current RTR fleet.
- The capability to run waste containers up to a SWB.
- The capability to identify prohibited items located in both low and high density waste streams.

7.2 High Energy RTR Unit Deployment Goal

Another goal of this project is to quickly and compliantly deploy the high energy RTR unit to Hanford site to support the PFP D&D efforts. This deployment will include interfacing with Hanford site to establish host site requirements including; siting the unit, running electricity, addressing DSA, etc.

7.3 Interrelationships and Project Dependencies

The main elements of the project are interrelated, and there are several project dependencies. Many project elements hinge upon the design of the unit. For example, the information needed for Hanford to prepare the site for receipt of the unit depends on the final design.

8.0 ENGINEERING AND DESIGN

The development of the high energy RTR unit will be managed through a subcontract with a supplier to design, fabrication, assemble, and test the unit under a Purchase Order with [redacted] The design will be approved by WTS via the AR/VR process. The design of the high energy RTR unit will include the following major components:

8.1 Enclosure

The high energy RTR will consist of an enclosure that, at a minimum, includes a control room, x-ray vault, and loading/unloading area.

8.2 X-ray System

The x-ray system will utilize a high energy source in conjunction with a software package that will allow prohibited items to be identified in high density waste streams using RTR.

8.3 Shielding

The shielding of the x-ray vault will be in accordance with ANSI/HPS N43.3.

9.0 PROCUREMENT AND MATERIALS MANAGEMENT

Requisitions required for the design, fabrication, and testing of the high energy RTR unit will be prepared by [redacted] The Subcontract Technical Representative will be [redacted] (primary) and [redacted] (alternate). Requisitions for the deployment of the high energy RTR unit will also be prepared by [redacted] The Subcontract Technical Representative will be [redacted] Procurement will be managed by the WTS Procurement Group utilizing approved procurement procedures.

10.0 PROJECT CONTROLS

The development of the high energy RTR unit will be assigned a work breakdown structure tracking number. As soon as the project is funded, it will be included in

the baseline planning documents. WTS Project Controls will track and report the budget and schedule.

11.0 PROJECT QUALITY PLAN

The quality assurance requirements applicable to the development of the high energy RTR unit are provided in Section 5.0 of the SOW for the Purchase Order with [redacted]

12.0 CONSTRUCTION

Construction and testing of the high energy RTR unit will be performed under the subcontract after the design has been approved by WTS via AR/VR.

CCP is in discussion with Hanford regarding construction at Hanford in preparation of the unit's arrival. It is anticipated that a concrete pad will be needed and that electrical and utilities will need to be run for deployment of the unit at Hanford.

13.0 COMMISSIONING AND START-UP

Upon successful design and fabrication, the unit will be deployed at Hanford. Upon deployment the unit will begin its certification process. Once it is certified, CCP will begin characterization and certification using this unit.

14.0 ENVIRONMENT, SAFETY, AND HEALTH

Upon successful design, fabrication, and testing of the high energy RTR unit, the shielding shall conform to the requirements of the PO, addressing all specific Environment, Safety and Health issues.

15.0 RISK MANAGEMENT

A unique risk associated with the development and deployment of this high energy RTR unit is that design, fabrication, and assembly is outside of CCP's normal area of expertise. The procurement of such activities/items is described in CCP-QP-015, *CCP Procurement*. It invokes the involvement of organizations outside of CCP such as WTS QA in the process. This risk is being managed through the development of this PXP and associated procurement documents. Meetings are scheduled to address concerns from past events.

The deployment portion this project is a normal CCP operation. This will be managed through the normal processes in conjunction with interfacing with Hanford.

16.0 PROJECT CLOSEOUT

Upon approval of the Factory Acceptance Testing and completion of the final document reviews and approvals per the subcontract, the development phase of this project will be considered complete.

Upon certification of the unit at Hanford, the completion of the CCP equipment descriptions and HSP, the deployment phase of this project will be considered complete.

17.0 PROJECT PROCEDURES

Procedures applicable to the high energy RTR unit will be prepared, implemented, and administered by CCP RTR operators with support from Document Services.

Attachment A – High Energy RTR Development and Deployment Schedule

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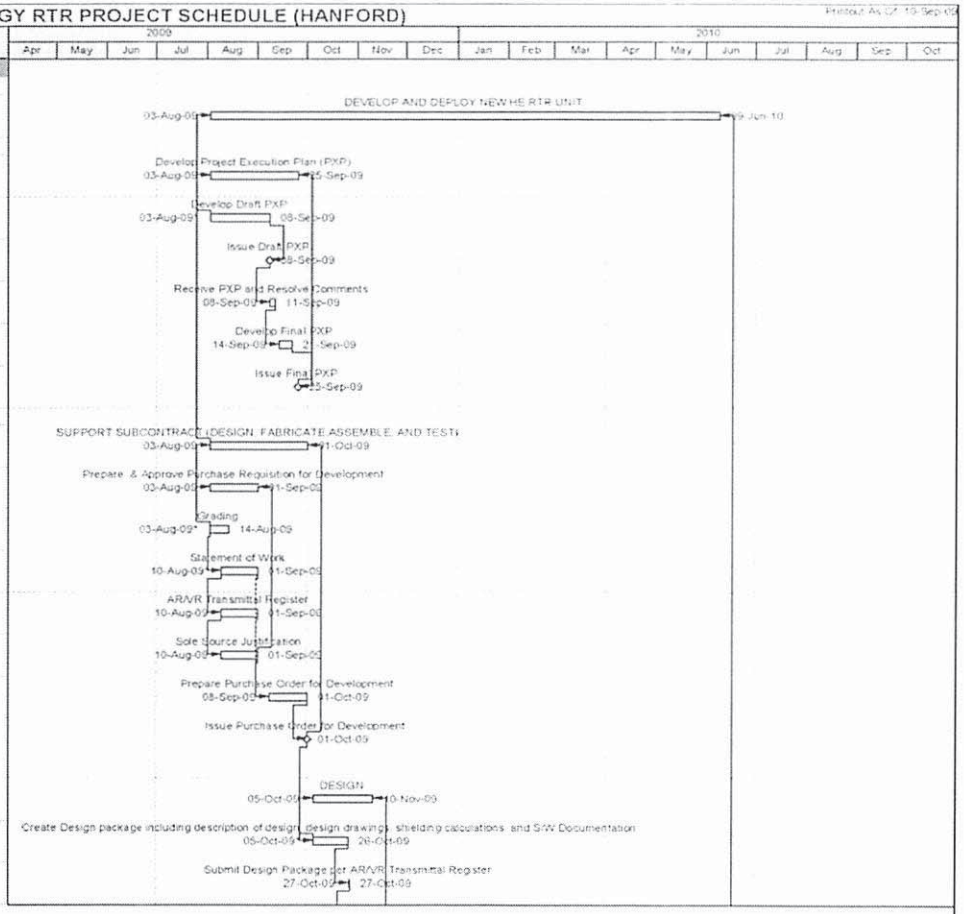
HIGH ENERGY RTR PROJECT SCHEDULE (HANFORD)

Printed: As Of: 10-Sep-09

Activity ID	Activity Name	Duration	Responsibility
Develop and Deploy New HE RTR Unit			
HRTR-0050	DEVELOP AND DEPLOY NEW HE RTR UNIT	223.0d	
Project Execution Plan			
HRTR-0075	Develop Project Execution Plan (PXP)	40.0d	
HRTR-1000	Develop Draft PXP	27.0d	WTS/CCP
HRTR-1005	Issue Draft PXP	0.0d	WTS/CCP
HRTR-1010	Receive PXP and Resolve Comments	4.0d	WTS/CCP
HRTR-1015	Develop Final PXP	6.0d	WTS/CCP
HRTR-1020	Issue Final PXP	0.0d	WTS/CCP
Support Subcontract (Design, Fabricate, Assemble, and Test)			
HRTR-0100	SUPPORT SUBCONTRACT (DESIGN, FABRICATE,ASSEMBLE, AND TEST)	44.0d	
HRTR-1025	Prepare & Approve Purchase Requisition for Development	22.0d	WTS/CCP
HRTR-1030	Grading	10.0d	WTS/CCP
HRTR-1035	Statement of Work	17.0d	WTS/CCP
HRTR-1040	AR/VR Transmittal Register	17.0d	WTS/CCP
HRTR-1045	Sole Source Justification	17.0d	WTS/CCP
HRTR-1050	Prepare Purchase Order for Development	18.0d	WTS/CCP
HRTR-1055	Issue Purchase Order for Development	0.0d	WTS/CCP
Design HE RTR Unit			
HRTR-0105	DESIGN	27.0d	
HRTR-1060	Create Design package including description of design, design drawings, shielding calculations, and S/W Documentation	16.0d	VJ Tech
HRTR-1065	Submit Design Package per AR/VR Transmittal Register	1.0d	VJ Tech



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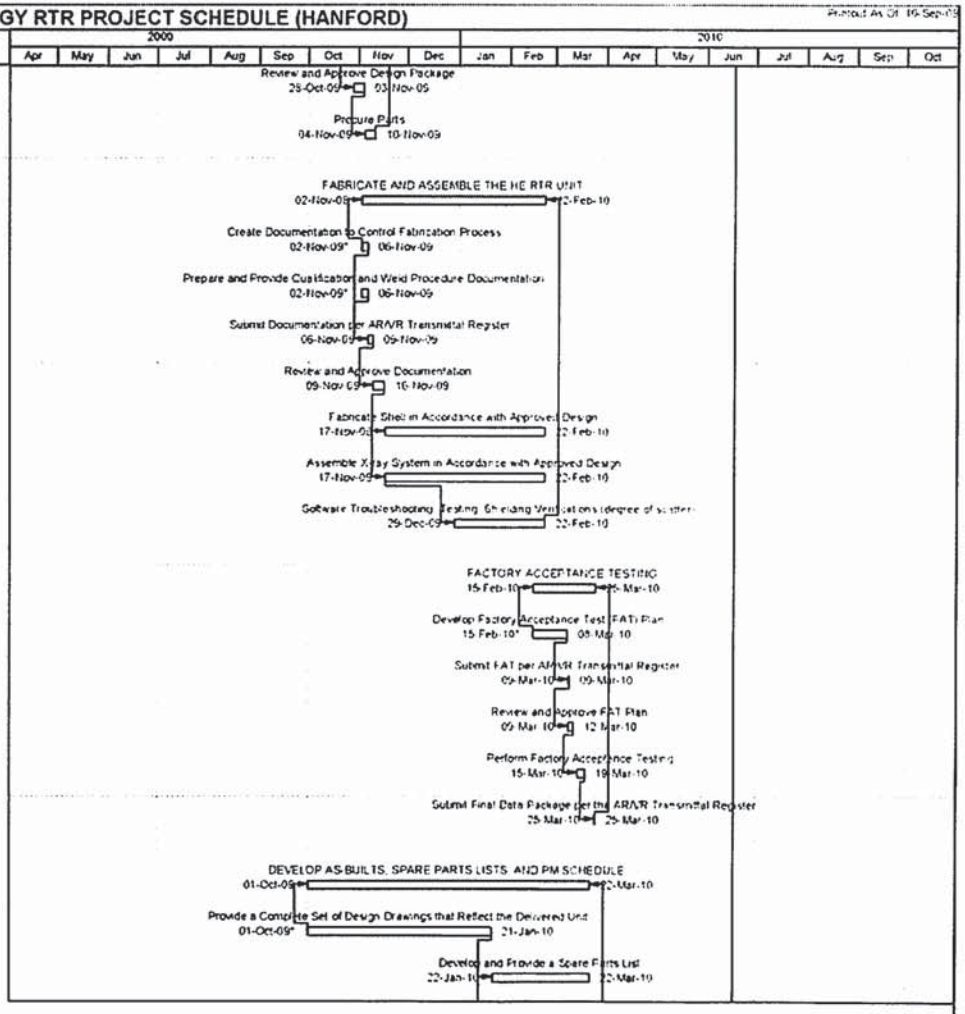
Attachment A – High Energy RTR Development and Deployment Schedule (Continued)

DRAFT — **HIGH ENERGY RTR PROJECT SCHEDULE (HANFORD)**

Activity ID	Activity Name	Duration	Responsibility
HRTR-1070	Review and Approve Design Package	5 0d	WTS/CCP
HRTR-1075	Procure Parts	5 0d	VJ Tech
Fabricate and Assemble the RTR Unit			
HRTR-0110	FABRICATE AND ASSEMBLE THE HE RTR UNIT	81 0d	
HRTR-1080	Create Documentation to Control Fabrication Process	5 0d	VJ Tech
HRTR-1085	Prepare and Provide Qualification and Weld Procedure Documentation	5 0d	VJ Tech
HRTR-1090	Submit Documentation per AR/VR Transmittal Register	2 0d	VJ Tech
HRTR-1095	Review and Approve Documentation	6 0d	WTS/CCP
HRTR-1100	Fabricate Shell in Accordance with Approved Design	70 0d	VJ Tech
HRTR-1105	Assemble X-ray System in Accordance with Approved Design	70 0d	VJ Tech
HRTR-1110	Software Troubleshooting, Testing, Shielding Verifications (degree of scatter)	40 0d	VJ Tech
Factory Acceptance Testing			
HRTR-0115	FACTORY ACCEPTANCE TESTING	29 0d	
HRTR-1115	Develop Factory Acceptance Test (FAT) Plan	16 0d	VJ Tech
HRTR-1120	Submit FAT per AR/VR Transmittal Register	1 0d	VJ Tech
HRTR-1125	Review and Approve FAT Plan	4 0d	WTS/CCP
HRTR-1130	Perform Factory Acceptance Testing	5 0d	VJ Tech
HRTR-1135	Submit Final Data Package per the AR/VR Transmittal Register	1 0d	VJ Tech
Develop As-Builts, Spare Parts List, and PM Schedule			
HRTR-0120	DEVELOP AS-BUILTS, SPARE PARTS LISTS AND PM SCHEDULE	123 0d	
HRTR-1140	Provide a Complete Set of Design Drawings that Reflect the Delivered Unit	81 0d	VJ Tech
HRTR-1145	Develop and Provide a Spare Parts List	42 0d	VJ Tech



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Attachment A – High Energy RTR Development and Deployment Schedule (Continued)