Controlled
Copy

RCT-PXP-017

Revision 0

Project Execution Plan for the Waste Isolation Pilot Plant Waste Information System

EFFECTIVE DATE: 07/31/2006

[redacted]

PRINTED NAME

APPROVED FOR USE

RECORD OF REVISION

Revision Number	Date Approved	Description of Revision
0	07/31/2006	Initial issue.

TABLE OF CONTENTS

1.0 PROJECT OVERVIEW 4
2.0 CONTRACT OVERVIEW 9
3.0 PROJECT ORGANIZATION 9
4.0 PROJECT ADMINISTRATION 9
5.0 PROJECT BUDGET AND SCHEDULE 10
6.0 PROJECT RESOURCES 10
7.0 UNIQUE PROJECT CONSIDERATIONS 11
8.0 ENGINEERING AND DESIGN 11
9.0 PROCUREMENT AND MATERIALS MANAGEMENT 15
10.0 PROJECT CONTROLS 15
11.0 PROJECT QUALITY PLAN 15
12.0 CONSTRUCTION 16
13.0 COMMISSIONING AND START-UP 16
14.0 ENVIRONMENT, SAFETY, AND HEALTH 16
15.0 RISK MANAGEMENT PLAN 17
16.0 PROJECT CLOSEOUT 18
17.0 PROJECT PROCEDURES 18

1.0 PROJECT OVERVIEW

1.1 Project Description

The WWIS is the Waste Isolation Pilot Plant (WIPP) Waste Information System. This system performs two crucial functions in the Transuranic (TRU) waste disposal process. The first is the gatekeeper function where all waste bound for the WIPP is checked against repository and transportation (Transuranic Authorized Methods for Payload Control [TRAMPAC]) requirements; second is the repository record function that provides a record of waste (and its characteristics) in the repository. The WWIS is defined as the only Mission Critical system at the WIPP. The WWIS is also required to exist by the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit* (HWFP) granted to the WIPP by the State of New Mexico for the disposal of hazardous materials. As such, this system, or something similar, will be in place for the life of the repository.

1.2 Summary of Work Scope

1.2.1 WWIS Version 5.3 (Started 3/05 – expected completion 7/06)

[A] WWIS Version 5.3 Modifications (Testing complete 5/20/06)

[B] Automated Shipping Category Applciation (ASC)/ TRUPACT-II Content (TRUCON) code table normalization (Ready to test/implement 5/25/06; Washington TRU Solutions (WTS) Packaging Group to provide acceptance test and procedure support)

1.2.2 WWIS Version 5.4 Demo (Started 8/05 – expected completion 6/06)

[A] Remote-Handled (RH)

[A.1] RH TRUCON Maintenance Application (RTMA) (complete to draft 3/06)

[A.2] RH TRAMPAC (complete to draft 3/06)

[A.3] RH waste support (complete to draft 5/12/06)

[B] Technical Safety Requirement (TSR) (multiple versions of TSR delivered since 11/05; next final due in early June, 2006)

[C] Confirmation Module (started 2/06; logic still being developed; no date for final)

1.2.3 WWIS Version 5.4

[A] WWIS Parallel Operation (start 5/06)

[B] RH (final scheduled for 8/06; changes expected)

[B.1] RTMA (high risk of change required)

[B.2] RH TRAMPAC (low risk of change required)

[B.3] RH waste support (low risk of change required)

[C] TSR (unknown)

[D] Confirmation Module (final expected 6/06; completion 7/06)

1.2.4 Tasks in Queue

[A] Replication (started 8/05; on hold)

[B] Bar Code/magnesium oxide (MgO) (started 1/05; on hold)

[C] Inter-site Shipment Tracking (pending)

[D] Storage Tracking (pending)

[E] Maintenance and Queries (ongoing)

1.3 Mission Statement

Provide the needed services to transport waste to the WIPP for disposal in a safe and cost-effective manner while maintaining a safe and environmentally friendly mode of operation and achieving 100 percent regulatory compliance.

1.4 Management Overview of the Project Execution

The WWIS is one of the core functions of the WIPP. It is defined as the only Mission Critical system at the WIPP.

Successful application of Versions 5.3 and 5.4 is critical to fulfilling the requirements of RH waste receipt and implementation of the Section 311/RH HWFP modification.

1.5 Critical Issues and Challenges

1.5.1 Limited resources
1.5.2 Short lead times
1.5.3 Working 'at risk' to draft governing documents

1.6 Mechanism of Release to Proceed

1.6.1 Engineering Change Order (ECO)

1.7 Client Identification

1.7.1 United States Department of Energy (DOE), Carlsbad Field Office (CBFO)

1.8 Third-Party Organizations

1.8.1 NCI
1.8.2 Generator Sites
1.8.3 New Mexico Environment Department (NMED)
1.8.4 United States Environmental Protection Agency (EPA)

1.9 Partnering

[redacted] has been selected through a competitive bid process to provide programming support on a Master Task Order contract spanning five years.

1.10 Applicable Reference Documents

The WWIS is governed by the American National Standards Institute (ANSI) Standard Nuclear Quality Assurance (NQA) 2.7, as required by the WTS Quality Assurance Program Plan (QAPP) Chapter 6, which requires specific documentation for software quality assurance (QA). The required documentation (listed below) is available via Quality and Manufacturing Integrated System (Q&MIS) and the Matrix.

- WIPP Procedure (WP) 08-NT.01, *WIPP Waste Information System Program and Data Management Plan*
- WP 08-NT.03, *Waste Stream Profile Form Review and Approval Program*
- WP 08-NT.04, *WIPP Waste Information System Configuration Management and Software Quality Assurance Program*
- WP 08-NT.05, *WIPP Waste Information System Software Verification and Validation Plan*
- WP 08-NT.06, *WIPP Waste Information System Software Requirements Specification*
- WP 08-NT.07, *WIPP Waste Information System Software Design Description*
- WP 08-NT.09, *Security Plan for WIPP Waste Information System*

1.11 Mechanism for the Alignment of Project Goals

Complex Wide Integration Tool (CWIT) Integrated Schedule

1.12 Known Potential Problems

1.12.1 Maintaining adequate strategic resources

1.12.2 Single points of failure within the WIPPNet exist

1.12.3 Configuration management in communications network

1.12.4 Inadequate training for WWIS Users on TRAMPAC

1.13 Overview of Project Schedule Milestones

See CWIT Integrated Schedule

2.0 CONTRACT OVERVIEW

The Carlsbad Field Office (CBFO) Work Breakdown Structure (WBS) is shown in Figure 1.

Permitting support and the associated CCP activities described in this PXP will be implemented as part of the RCT scope of work which is funded within the Waste Services WBS element 1.1.

The CCP will characterize and certify RH-TRU waste.

Other work supported by the CCP organization during FY-2006 will include characterization optimization activities necessary to provide efficient and productive operations at the DOE sites. Such activities include characterization and/or certification of special case wastes (i.e., classified wastes, preparations for large box characterization, orphan wastes, waste repackaging).

3.0 PROJECT ORGANIZATION

3.1 Key Project Personnel

[redacted] – Department Manager
[redacted] – Project Manager/Team Lead
[redacted] – Developer/Data Base Administrator (DBA)
[redacted] – Developer (Hallel)
[redacted] – Systems Adminstrator
[redacted] – Data Administrator (DA)/Testing/DBA Trainee
[redacted] – DA/Subject Matter Expert (SME)/Documentation
[redacted] – DA/SME/User Support
[redacted] – DA/Testing/Systems Administrator Trainee
[redacted] – Software QA
[redacted] – in [redacted] Project Manager

4.0 PROJECT ADMINISTRATION

4.1 Document Control

This is handled through several channels as follows:

- CBFO for the WWIS Users Guide
- WIPP's Q&MIS for WWIS program documents
- The WIPP Engineering File Room (EFR) (for ECOs), and
- in [redacted] MATRIX (for Issue Tracking, System Requirements and Design Documents)

4.2 Correspondence

All correspondence, except formal contract communications, is handled as electronic mail (email). All requests for WWIS services and changes are submitted to the WWIS Team Lead in the form of an email for recordkeeping purposes. Each team member is responsible for maintaining their own emails. Archiving on a quarterly basis is recommended.

5.0 PROJECT BUDGET AND SCHEDULE

See CWIT Integrated Schedule

6.0 PROJECT RESOURCES

6.1 Project Staffing Plan

Staff is described in Section 3.0. The practice is to keep a core staff for maintenance and continuity and augment as required on a project basis.

6.2 Computer Requirements

See Section 8.3.

6.3 Electronic Communication

The WWIS is the connection between the source of the waste and the destination of the waste. Without communication, data cannot flow; without data, waste cannot flow. A reliable data communication infrastructure must be available.

This infrastructure must address adequate bandwidth, reliability, security and ease of use. Progress towards a trouble-free system has been slow, but diligent efforts on the part of all involved have made the system work.

The WWIS has been modified to use less bandwidth. A terminal server system has been installed to reduce bandwidth requirements.

A proposal to address a number of the infrastructure issues by placing a backup system at the site of our largest customer has been made. This proposal is still requires action by CBFO and DOE Idaho Operations Office (ID).

7.0 UNIQUE PROJECT CONSIDERATIONS

7.1 Confidentiality of Information

No classified data is permitted in the WWIS. Additional confidentiality issues exist, but must be managed within the context of access by regulators to the system. In general, the best practices method of restricting data access to only the individuals needing the data is followed.

7.2 Security/Safety/Risks

The WWIS is required to have a Security Plan by DOE and Office of Management and Budget (OMB). This plan is reviewed, approved and audited by the Information Systems Site Security Manager (ISSM).

7.3 Complexity

The WWIS is a complex system. The complexity of the integrated WWIS systems has increased both constantly and significantly over the past seven years.

The addition of parallel processing in Version 5.4 will represent the largest single increase in complexity since the addition of the TRAMPAC checks. Ideally, this functionality would have been designed into the system during a major update; schedule constraints dictated a more expedient approach. Additional costs will be incurred at a later date to remove the parallel constructs.

Addition of RH waste checks and the RH Confirmation Module add two more increments of complexity. These additions will affect both future development and maintenance costs.

8.0 ENGINEERING AND DESIGN

8.1 General

The WWIS was implemented as a Client/Server database. This database model has not fared well in practice; this generation of tools has been dropped by most organizations due to high network bandwidth requirements and high software deployment costs. Support for future development of this model is diminishing.

Current design philosophy favors a three tiered system for greater flexibility in software design, support package selection, lower bandwidth requirements and more agile response to the customer's needs.

Movement to this model is not a trivial task; incremental progress has been steady as new packages (WWIS TRAMPAC Evaluation Software [WTES], RTMA, ASC) have been added which support the needed changes.

8.2 Permits, Law and Regulations

- HWFP
- 49 *Code of Federal Regulations* (CFR) Resource Conservation and Recovery Act (RCRA)
- 49 CFR (Transportation)
- Land Withdrawal Act
- DOE Orders
- OMB (Security)

8.3 System Descriptions

The WWIS is comprised of the following sub-systems:

Hardware

The WWIS runs on a pair of [redacted] servers (one for productions and one for fail-over or clustering if needed) with two processors and two gigabytes of memory. These systems are connected via a fabric switch to a pair of storage area networks. Another [redacted] is available for web-based content serving. These systems are placed behind a [redacted] firewall with a [redacted] server running Microsoft Windows 2003 Terminal Server to address network bandwidth restrictions. All access to the system is controlled and encrypted. An identical backup system is in place for geographic diverse placement.

Software

WWIS Application – An Oracle Forms (Version 6.0.8.26.0)-based package designed to both control and ease the interface of the users with the database consisting of the following modules:

- Characterization Module
- Certification Module
- Shipping Module
- Inventory Module
- Maintenance Module
- Electronic Data Transfer Module

WWIS Database – this is a relational database built using version 9.2.0.6 of the Oracle Enterprise database management system (DBMS) package.

In addition, auxiliary packages needed to perform mathematical calculations not feasible within the Oracle environment are done in an Oracle supported Java Virtual Machine (Version 1.5.0_06).

WTES
RH TRAMPAC Evaluation Software (RTES)

The following Java-based support packages are web-enabled and run under Tomcat web services (Version 5.0.28):

ASC
RTMA

8.4 Determination of Requirements

The WWIS software development process is based upon the referenced program documents which largely emulate Institute of Electrical and Electronics Engineers, Inc. (IEEE) software methodology and implemented using the 'extreme' programming methods as much as reasonable in order to both reduce cost and time-to-market. The development work is done by [redacted] is under a fully IEEE-compliant program.

8.5 Definition of Deliverables

Deliverable is defined as fully tested and operational WWIS Version 5.3, an unqualified demonstration version of Version 5.4, and upon delivery of final driver documents with modification and testing as required, a fully qualified Version 5.4.

8.6 Computer Systems and Methods Needed

This is addressed in Section 8.3.

8.7 Design Reviews

Design reviews are performed under the requirements of WP 08-0NT.04.

8.8 Value Engineering/Cost Reduction Program

The WWIS team includes cost reduction elements into the system design as feasible.

8.9 Operations Manuals

The DOE/CBFO 97-2273, *WIPP Waste Information System User's Manual* is the primary document to describe the operation of the WWIS. Use of this document requires some familiarity with DOE/CBFO 02-3122, *Contact-Handled Transuranic Waste Acceptance Criteria for the Waste Isolation Pilot Plant* (CH-WAC), the *Waste Isolation Pilot Plant Hazardous Waste Facility Permit, Attachments B-B6, Waste Analysis Plan* (WAP), the HWFP, the TRAMPAC and its appendices, 40 CFR and 49 CFR for the disposal and transportation of hazardous TRU wastes. Separate User Guides for the ASC and RTMA packages have been prepared.

8.10 Operator Training

Operator training is provided by periodic WWIS Users Group meetings; four meetings have been held to date. The current frequency is one per 14 – 18 months. These meetings have been scheduled to precede a major software release in order to inform the user base of the upcoming changes. The next planned meeting is in October of 2006 to address RH and Confirmation logic additions.

9.0 PROCUREMENT AND MATERIALS MANAGEMENT

9.1 Procurement Systems

The standard WIPP procurement process is used.

9.2 Inspection Services

Developed code is subject to first, Peer Review between members of the Development Team, then by the WWIS Software QA Specialist. Finally, the integrated code package is tested to a formal test plan to demonstrate both functionality and utility of the User Interface.

9.3 Approved Project Supplier List

[redacted] – hardware and software
[redacted] – DBA services
[redacted] – software development

9.4 Subcontracting and Administration

This is done under standard WIPP procedures.

10.0 PROJECT CONTROLS

10.1 Methods of Scope Estimating and Documentation

The WWIS funding is largely established from a base budget; attempted scope is estimated on historical costs of previous and similar work. With the increasing complexity of logic in the WWIS, chances for underestimation of costs are increasing.

10.2 Method of Change Control/Management

Software changes are controlled through WP 08-NT.04 using the open source Concurrent Version System (CVS) package.

11.0 PROJECT QUALITY PLAN

Required compliance with DOE/CBFO 94-1012, *U.S. Department of Energy Carlsbad Field Office Quality Assurance Program Document* (QAPD), or applicable quality standard.

Software QA is performed under the requirements of WP 08-NT.04.

12.0 CONSTRUCTION

No construction activities will be used by this project.

13.0 COMMISSIONING AND START-UP

13.1 Precommissioning

Prior to startup of a new version of the WWIS, generator sites are given fully functional Beta test versions of the software and a clean copy of the production instance for two weeks prior to the change-over. Generator sites are encouraged to work through needed procedure and software changes to maintain compatibility.

13.2 Plant Start-Up

Final formal testing as described above is performed in a test instance built by running the same structured query language (SQL) scripts that will be used to build the final production instance.

When the final modified production instance is built, random checks of data integrity (record counts) and basic functionality are performed to verify a successful build.

13.3 Operator Training

This was addressed in Section 8.10.

14.0 ENVIRONMENT, SAFETY, AND HEALTH

14.1 Safety Policy

Compliance with all aspects of WIPP safety policies is required.

15.0 RISK MANAGEMENT PLAN

WTS managers involved in project execution participate in the identification and assessment of program risks. They review program documents, evaluate lessons learned, and use brainstorming and their own experience to identify risks. Project risks are identified in the following areas:

- Cost and Schedule
- Technical
- Programmatic (Obtaining and utilizing resources outside the control of the program manager)
- Support
- Safety
- Regulatory/Permitting
- Site specific (Including alternative site locations)

Once risks are identified, WTS categorizes the identified risks by probability and severity (consequences) of each event.

After risks have been identified and categorized, a risk management approach and mitigation actions are developed for each High and Medium risk. For Low risk elements not judged to require documented mitigation actions, WTS Managers assure that they are controlled through the normal management functions and work processes. All risks and mitigation actions are identified in the CBFO Risk Management Plan, which is updated annually.

In order to determine the effectiveness of the Risk Management Plan, the areas of Medium and High risks are monitored and statused during monthly program meetings with CBFO. In addition, periodic reassessments of programs are performed to determine if new areas of risk need to be identified and assessed.

Specific risks associated with the implementation of this PXP include the following:

- The Section 311 modification to the WIPP Hazardous Waste Facility Permit may be delayed or altered significantly. WTS mitigation includes close and frequent contact with the regulators.

- Insufficient resources to complete tasks on schedule. CCP management will receive frequent progress updates.

16.0 PROJECT CLOSEOUT

The project will be closed out when the appropriate software has been written and tested, procedures have been revised and implemented, and CBFO has issued approval letters to CCP for the projects at INL, LANL, and SRS that they are certified under the revised (Section 311 modification) WIPP Hazardous Waste Facility Permit.

17.0 PROJECT PROCEDURES

See program documents referenced in Section 1.10.