Hanford Waste Vitrification Plant Quality Assurance Program Description — Overview and Applications

Westinghouse Hanford Company

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**HANFORD WASTE VITRIFICATION PLANT QUALITY ASSURANCE
PROGRAM DESCRIPTION - OVERVIEW AND APPLICATIONS**

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**HANFORD WASTE VITRIFICATION PLANT QUALITY ASSURANCE
PROGRAM DESCRIPTION - OVERVIEW AND APPLICATIONS**

ABSTRACT

This document (Parts 1 and 2) describes the requirements that must be implemented during the design and construction phases for the Hanford Waste Vitrification Plant Project Quality Assurance Program. This program is being implemented to ensure the acceptability of high-level radioactive canistered waste forms produced by the Hanford Waste Vitrification Plant for disposal in a licensed federal repository.

The objective of this Quality Assurance Program Description is to provide the Hanford Waste Vitrification Plant Project Participants with guidance and direction for program implementation while satisfying the needs of the U.S. Department of Energy-Office of Civilian Radioactive Waste Management concerning repository licensing activities with regard to canistered waste forms. To accomplish this objective, this description will be prepared in three parts:

- Part 1 - Overview and applications document*
- Part 2 - Development and qualification of the canistered waste form*
- Part 3 - Production of canistered waste forms.*

Part 1 briefly describes the background, strategy, application, and content of the Hanford Waste Vitrification Plant Quality Assurance Program.

Part 2, which covers the development and qualification of the canistered waste form, is applicable to the design and construction phases of the Hanford Waste Vittrification Plant. Part 2 is specifically focused to ensure that waste forms to be produced by the Hanford Waste Vittrification Plant will meet waste acceptance criteria.

Part 3 will apply to operations and describe the quality assurance program appropriate for production operations; thus, it will be developed shortly before production begins. Part 3 will be specifically focused to ensure that canistered waste forms produced by the Hanford Waste Vittrification Plant can be certified.

Currently, Parts 1 and 2 comprise the Hanford Waste Vittrification Plant Quality Assurance Program Description. Part 3 will become effective when production begins and will then replace Parts 1 and 2 as the active Quality Assurance Program Description for the Hanford Waste Vittrification Plant.

CONTENTS

1.0	INTRODUCTION	1
2.0	PROGRAM OBJECTIVES	1
3.0	PROGRAM APPLICATION	1
3.1	PROJECT SCOPE	2
3.2	STRATEGY	2
3.3	RESPONSIBILITIES	2
3.4	PROJECT SCHEDULE	2
4.0	PROGRAM CONTENT	3
4.1	PROGRAM REQUIREMENTS	3
4.2	TRANSFER OF REQUIREMENTS TO PARTICIPANTS	3
4.3	PROGRAM OVERVIEW	3
4.4	CONTROL	3
5.0	REFERENCES	4
6.0	GLOSSARY	4

HANFORD WASTE VITRIFICATION PLANT QUALITY ASSURANCE PROGRAM DESCRIPTION - OVERVIEW AND APPLICATIONS

1.0 INTRODUCTION

This document provides an overview description of the Hanford Waste Vitrification Plant (HWVP) Project Quality Assurance (QA) Program. In addition, this document describes the activities that constitute the required QA program.

As defined in Part 2 of WHC-EP-0393, *Hanford Waste Vitrification Plant Quality Assurance Program Description for High-Level Waste Form Development and Qualification* (QAPD) (WHC 1993), the program applies the requirements of DOE Order 5700.6C, *Quality Assurance* (DOE 1991) to quality affecting activities in a graded manner. The program also applies the requirements of DOE/RW-0214, *Quality Assurance Requirements Document for the Civilian Radioactive Waste Management Program* (DOE-OCRWM 1990) to waste acceptance process activities (WAPA).

2.0 PROGRAM OBJECTIVES

The objectives to be achieved through the development and implementation of this QA program are as follows:

1. To ensure the attainment of high-level waste (HLW) processing objectives with a level of quality that is commensurate with the U.S. Department of Energy's (DOE) and the Hanford Site contractors' responsibility for the following: protection of the health and safety of government employees, contractors, and the general public; protection of the environment; protection of the government's investment; and efficient and effective use of resources
2. To ensure that research and development activities; production processes, facilities, equipment, and services; and products produced by or for the government conform to defined requirements.

3.0 PROGRAM APPLICATION

The HWVP Project QA Program is applied to the quality affecting activities performed by the DOE, Richland Operations Office (RL) HWVP Project Branch, Westinghouse Hanford Company (WHC), and the associated contractors: Fluor Daniel, Inc. (Fluor); UE&C-Catalytic Inc. (UCAT); and Pacific Northwest Laboratory (PNL). A portion of the quality affecting activities are those defined as WAPA. These are the activities through which documentation and data are collected and prepared to support compliance with the waste

acceptance specification (WAS). This includes activities associated with the following: research, development, and testing that are essential to qualification of the waste form; control of materials, equipment, facilities, and processes that are essential to the certification of canistered waste forms; and processing operations that are essential to the certification of canistered waste forms.

3.1 PROJECT SCOPE

In the HWVP, appropriate Hanford Site HLW will be immobilized in a borosilicate glass form and canistered (put into stainless steel containers) for ultimate disposal in the federal HLW repository. Operation is officially scheduled to commence according to the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology 1992), which presently schedules start of operations for 1999. However, the Tri-Party Agreement is being renegotiated to cause HWVP operations to commence in the year 2000.

3.2 STRATEGY

The DOE strategy for ensuring the acceptability of HLW forms produced in its facilities for disposal in the federal repository has been identified as the waste acceptance process (WAP). The four elements of the WAP are as follows: (1) WAS, (2) Waste Form Compliance Plan, (3) Waste Form Qualification Report, and (4) Production Records.

A description of the WAP is contained in DOE/EM/WO/02, *Vitrification Projects Division High-Level Waste Quality Assurance Program Description* (DOE 1990). The description is not repeated here.

3.3 RESPONSIBILITIES

DOE-Headquarters (HQ)--The responsibilities of the DOE-HQ organization are defined in a QAPD for the Office of Environmental Restoration and Waste Management.

RL--The responsibilities of the RL organizations are defined in a QAPD for RL.

Responsibilities of WHC and the HWVP Project Participant (participant) contractors are defined in Part 2 of this HWVP QAPD (WHC 1993).

3.4 PROJECT SCHEDULE

Developmental work in support of waste form qualification for the HWVP is presently under way. Preliminary design of the facility was completed during calendar year 1990 and detailed design was initiated during the same period. Construction of HWVP began in April 1992. Cold and hot testing for process and product qualification will take place later in the decade. Hanford Waste Vitrification Plant operations and routine waste form production will follow.

4.0 PROGRAM CONTENT

Part 2 of the HWVP QAPD covers the quality affecting work activities during design and construction of the HWVP. Part 3 has not yet been developed because it will apply to HWVP production operations. Thus, the current QA program for the HWVP Project is described by Parts 1 and 2 of the HWVP QAPD.

4.1 PROGRAM REQUIREMENTS

In general, the program requirements for HWVP Project QA stem from two sources: DOE Order 5700.6C applies to all aspects of the HWVP, while DOE/RW-0214 applies to WAPA-related aspects of the HWVP. These two important sources of QA requirements are supplemented by a variety of other DOE Orders and directives, as delineated in Part 2 of the HWVP QAPD.

4.2 TRANSFER OF REQUIREMENTS TO PARTICIPANTS

The HWVP QAPD, Part 2, identifies the QA requirements applicable to the HWVP Project participant contractors. Westinghouse Hanford Company retains overall responsibility for the QA program; however, certain activities are delegated to the participant contractors. Each participant contractor has a QA program that guides its respective scope of work. Westinghouse Hanford Company provides overview of the participant contractors to verify QA systems are established and implemented.

4.3 PROGRAM OVERVIEW

The QA program established by Part 2 of the HWVP QAPD defines the overview requirements for HWVP Project QA, as follows.

1. Each participant contractor establishes a quality assurance plan (QAP) for its scope of work; WHC will review and approve each QAP.
2. The implementing procedures for each contractor are submitted to WHC for acceptance.
3. Westinghouse Hanford Company QA personnel conduct overviews (audits, surveillances, etc.) to verify that Fluor, UCAT, and PNL, as well as HWVP Project personnel at WHC, are implementing their QA programs.

4.4 CONTROL

The WHC HWVP Project and participating contractors are subject to overview by RL at all times. Audits and surveillances have been, and will continue to be, conducted by RL to verify program implementation.

5.0 REFERENCES

- DOE, 1990, *Vitrification Projects Division High-Level Waste Quality Assurance Program Description*, DOE/EM/WO/02, Revision 1, U.S. Department of Energy-Office of Waste Management, Office of Environmental Restoration and Waste Management, Washington, D.C.
- DOE, 1991, *Quality Assurance*, DOE Order 5700.6C, U.S. Department of Energy-Headquarters, Washington, D.C.
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- Ecology, EPA, and DOE, 1992, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.
- WHC, 1993, *Hanford Waste Vitrification Plant Quality Assurance Program Description for High-Level Waste Form Development and Qualification*, WHC-EP-0393, Part 2, Westinghouse Hanford Company, Richland, Washington.

6.0 GLOSSARY

ABBREVIATIONS AND ACRONYMS

DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy-Headquarters
Fluor	Fluor Daniel, Inc.
HLW	high-level waste
HWVP	Hanford Waste Vitrification Plant
participant	Project Participant: HWVP-dedicated organization of DOE, WHC, Fluor, UCAT, or PNL
PNL	Pacific Northwest Laboratory
QA	quality assurance
QAP	quality assurance plan
QAPD	Quality Assurance Program Description
RL	U.S. Department of Energy, Richland Operations Office
Tri-Party Agreement	Hanford Federal Facility Agreement and Consent Order
UCAT	UE&C-Catalytic Inc.
WAP	waste acceptance process
WAPA	waste acceptance process activities
WAS	waste acceptance specification
WHC	Westinghouse Hanford Company

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