

Inspection Program Plan for Z-Area Vault 4

Authored By:
A.S. Plummer

Publication Date: February 2008

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

This document was prepared in connection with work done under Contract No. DE-AC09-96SR18500 with the U. S. Department of Energy

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DOCUMENT: LWO-LWE-2008-00023, Rev. 0

TITLE: Inspection Program Plan for Z-Area Vault 4

REVIEWED BY:

C.E. Blair Date: 2.5.08

C.E. Blair, Tank Farm Structural Integrity Lead

P.W. Norris per Date: 2/5/08
telecon 2/5/08

P.W. Norris, Z-Area Engineering Manager

K.R. Liner Date: 2/5/08

K.R. Liner, Site Regulatory and Planning

Table of Contents

1	INTRODUCTION	5
2	SCOPE.....	5
3	RESPONSIBILITIES.....	5
3.1	TANK FARM ENGINEERING STRUCTURAL INTEGRITY (SI) GROUP	5
3.2	TANK FARM MAINTENANCE CAMERA CREW.....	5
4	INSPECTION REQUIREMENTS AND METHODS.....	6
4.1	SCOPE.....	6
4.2	QUALIFICATIONS OF INSPECTORS	6
4.2.1	<i>VT Inspector(s)</i>	6
4.2.2	<i>Data Collector(s)</i>	6
4.3	EXAMINATION METHODS	6
4.3.1	<i>Visual Examinations (VT)</i>	6
4.3.2	<i>Equipment Qualification</i>	7
4.3.3	<i>Procedures</i>	7
5	FREQUENCY AND EXTENT OF INSPECTIONS.....	7
5.1	FREQUENCY AND EXTENT OF INSPECTION	7
6	EVALUATION EXPECTATIONS.....	7
7	RECORDS.....	8
7.1	PURPOSE.....	8
7.2	SCOPE.....	8
7.3	PROCEDURE.....	8
7.4	MAINTAINED RECORDS	8
7.5	STORAGE FACILITY REQUIREMENTS	8
7.6	REPORT & LETTER STORAGE/RECORDS	8
7.7	VIDEO TAPE, PHOTOGRAPHS, SLIDES, MAGNETIC MEDIA	8

1 INTRODUCTION

In-service inspection of the Savannah River Site (SRS) Z-Area Vault 4 will be performed to provide a historical photographic record of the external vault condition in the bottom portion (approximately 0-8 feet) for wet spot indications. Approximately 0-8 feet was chosen as the inspection area based on the wall design criteria for gravity and hydrostatic head pressure (reference W828992). A program plan (which includes visual (VT) inspections utilizing digital photography) of the Z-Area Vault 4 has been developed. The program herein provides details for VT inspections that will include the extent, frequency, and equipment for VT inspection.

2 SCOPE

An important element in the demonstration of Vault condition is a program to provide in-situ material condition information. Inspection also provides early detection of degradation, and allows for an appropriate response. The VT examinations to be done for Vault 4 will be used to evaluate and document the material condition of the Vault. Validation will be done by establishing a photographic baseline for the concrete walls of the Vaults and then periodically re-examining those areas previously identified as wet spots for any detectable changes. Additionally, daily visual inspections will be performed of the Vault 4 exterior walls per facility procedures. If during a daily inspection, a new wet spot is observed, a re-examination shall be performed of the new wet spot by the Tank Farm Maintenance Camera Crew. This re-examination will undergo the same evaluation process as the 12 month inspection. The program includes visual inspection of the exterior walls of each Cell of Vault 4.

This document details the complete program. Elements of the program include the following:

1. Visual Inspection
2. Organizational Responsibilities
3. Extent of Inspection
4. Frequency of Inspection
5. Equipment
6. Inspector Qualifications
7. Acceptance Criteria/Action Limits
8. Records Management

3 RESPONSIBILITIES

3.1 Tank Farm Engineering Structural Integrity (SI) Group

SI shall:

1. Develop and maintain plans for inspections and indication investigations.
2. Generate, review, and authenticate inspection records.
3. Review, validate, report, and disposition inspection results
4. Maintain records, including index(s) of inspections.

3.2 Tank Farm Maintenance Camera Crew

Camera Crew shall:

1. Perform applicable inspections in accordance with qualified inspection procedure(s) or

instructions.

2. Perform surveillance and monitoring as directed by the SI Group.
3. Operate and maintain surveillance and monitoring equipment.
4. Perform work and complete records with guidance from the SI Group.
5. Maintain records as appropriate.

4 INSPECTION REQUIREMENTS AND METHODS

4.1 Scope

This section details the VT inspection requirements, including inspector qualifications, examination methods, and equipment qualification.

4.2 Qualifications of Inspectors

This section establishes a requirement for certification of personnel who perform or assist in the surveillance, monitoring, and inspection of Z-Area Vault # 4.

4.2.1 *VT Inspector(s)*

Personnel interpreting and/or reviewing data shall be certified to at least VT Level II-L in visual examination, in accordance with NDEP 2.1.

All certified personnel shall pass an annual eye examination given by SRS Medical personnel or SRS Level III personnel. Personnel shall meet the following eye examination requirements:

1. Distance vision of 20/30 in at least one eye either corrected or uncorrected.
2. Near vision capability to read Jaeger type 1 letters at a distance not less than 12 inches on a Jaeger Test Chart or Snellen Equivalent.
3. Color vision must be acceptable for the NDE method in which certification is sought.

4.2.2 *Data Collector(s)*

Data collectors are not required to be certified, but they are required to be proficient in equipment operation and data collection in accordance with the applicable procedures.

4.3 Examination Methods

4.3.1 *Visual Examinations (VT)*

The following summarizes the current visual examination program. As VT data is acquired, recommendations for modifications of this plan will be identified and presented for review and approval.

Inspection plans shall be prepared for each inspection period prior to the actual inspection and shall include the following:

1. Vault/Cell identification
2. Access

3. Bases for each inspection
4. Frequency
5. Access constraints
6. Inspection type

The visual inspection (VT) interval shall be every 12 months, with up to a 25% grace period allowance, to include all accessible exterior walls. Additionally, daily visual inspections will be performed of the Vault 4 exterior walls per facility procedures. If during a daily inspection, a new wet spot is observed, a re-examination shall be performed of the new wet spot by the Tank Farm Maintenance Camera Crew. This re-examination will undergo the same evaluation process as the 12 month inspection. Increased surveillance may be necessary to monitor relevant conditions pending disposition.

4.3.2 Equipment Qualification

Equipment includes, but is not limited to cameras (film, digital and video), remote cameras, and fiberscopes. This equipment shall be used for surveillance, monitoring, and documentation of the condition of Vault/Cell walls for historical photographic record. Equipment used for surveillance, monitoring or inspection (annual inspections) shall be qualified for use by performance demonstration.

4.3.3 Procedures

All inspections shall be performed according to the appropriate procedures or instructions.

5 FREQUENCY AND EXTENT OF INSPECTIONS

5.1 Frequency and Extent of Inspection

The following inspection frequency shall be used for VT examination of the Z-Area Vault 4:

Vault #4 is constructed of 18 inch thick reinforced concrete walls. The Vault is divided into 12 separate Cells. As described in inspection reports ECS-CES-96-0031 and PEC-SEG-97-0061, there are a multitude of existing cracks. A VT examination, using digital photography, is to be performed on all accessible exterior surfaces every 12 months, with up to a 25% grace period allowance. The examination shall be performed in accordance with section 6.0, "Evaluation Expectations". Additionally, daily visual inspections will be performed of the Vault 4 exterior walls per facility procedures. If during a daily inspection, a new wet spot is observed, a re-examination shall be performed of the new wet spot by the Tank Farm Maintenance Camera Crew. This re-examination will undergo the same evaluation process as the 12 month inspection.

6 EVALUATION EXPECTATIONS

1. Identify potential wet spots on the external walls of Vault # 4. The observed conditions shall be documented via digital photography for a review by the facility Subject Matter Expert (SME). Details shall be included if there is a change in condition from the previous inspection performed, specifically stains or wet spots.
2. The location, nature and extent of any other observed surface disorder. Examples include popout areas (The breaking away of small portions of a concrete surface due to localized internal pressure which leaves a shallow, typically conical, depression), Scaling (Local flaking or peeling away of the near

surface portion of hardened concrete or mortar), and Spalling (A fragment usually in the shape of a flake, detached from a larger mass by a blow, by the action of weather, by pressure, or by expansion within the large mass).

The reporting and communication of the inspection results shall be conducted in accordance with Procedure ENG.23 of the S4 Manual, "Liquid Waste Disposition Project In-Service Inspection Communications Program".

7 RECORDS

7.1 Purpose

This section establishes requirements for the identification, administration and storage of documents and data generated during the performance of surveillance, monitoring and inspection of Z-Area Vault # 4.

7.2 Scope

The requirements herein are applicable to data compiled in surveillance, and inspection of Z-Area Vault # 4.

Written reports, inspection plans, photographs, slides, videotapes, and other such information are subject to the requirements of this section.

7.3 Procedure

Records shall be protected from loss, damage, and unauthorized access, and must be retrievable and legible. Each employee is responsible for assuring that the records(s) they create is properly authenticated, and plans for adequate retention are implemented. Records shall be maintained as specified; when the retention period has expired.

7.4 Maintained Records

1. An index of records
2. Inspection plans
3. Repair records
4. Inspection procedures
5. Inspection results/reports shall be maintained by Tank Farm Engineering SI Group and distributed as appropriate.
6. Images of inspection activities (videotapes, disks, photographs, slides, digital images, etc).

7.5 Storage Facility Requirements

Records shall be stored in a facility that complies with site storage facility requirements.

7.6 Report & Letter storage/records

Paper records shall be stored in accordance with site requirements for records.

7.7 Video Tape, Photographs, Slides, Magnetic Media

Non-paper media are considered specially processed records and require the following additional

storage and special handling requirements:

1. Store in such a manner so as to prevent damage from excessive light, stacking, electromagnetic fields (electronic media), temperature, and humidity.
2. Store records separately in individual sleeves, envelopes, or folders. If these sleeves, envelopes, or folders contain adhesives, the adhesive portion must not come into contact with the media.
3. Handle film media outside of its protective enclosure utilizing white cotton low-lint or lint-free gloves.

REFERENCES

1. ECS-CES-96-0031, "WSRC STRUCTURAL MECHANICS INSPECTION OF Z AREA VAULT #4, CELL A", JUNE 17, 1996.
2. PEC-SEG-97-0061, "INSPECTION OF CONCRETE WALLS OF SALTSTONE VAULTS #1 & #4", September 2, 1997.
3. ACI 201.1R, "GUIDE FOR MAKING A CONDITION SURVEY OF CONCRETE IN SERVICE".
4. W828992, SRP DWPF-200Z Area Saltstone Vaults 6 & 7 Plan, sections and detail concrete.