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2. To: (Receiving Organization)  S/RID REQUIREMENTS
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Key words: S/RID, requirements management, W-420, Stack Monitoring System Upgrades

This document answers the question:

"Do Project W-420 Activities introduce the need to add new requirements to the TWRS Standards/Requirements Identification Document?"

15. DATA TRANSMITTED

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16. KEY

1. Approval  4. Review
2. Release  5. Post-Review

17. SIGNATURE/DISTRIBUTION

See Distribution Sheet for functional area approval signatures

18. James A. Tuck

19. Authorized Rep. Date

20. Design Authority Date

21. DOE APPROVAL (if required)

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Evaluation of the TWRS S/RID for Additional Requirements Resulting From Project W-420 Stack Monitoring System Upgrades

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

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Key Words: S/RID, Requirements Management, W-420, Stack Monitoring System Upgrades, ES&H requirements.

Abstract: This document answers the question: "Do Project W-420 Activities introduce the need to add new requirements to the TWRS S/RID?" and documents that basis for the answer. It concludes that no additional S/RID requirements are necessary.

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A-6400-073 (01/97) GEF321
1.0 INTRODUCTION

Project W-420, Stack Monitoring System Upgrades, will provide new effluent sampling equipment on six Tank Waste Remediation System (TWRS) facilities. The upgraded systems will support the safe, continued conduct of operations and maintenance, will meet current environmental and Authorization Basis (AB) requirements, and will provide for high reliability and flexibility in support of Hanford's long term cleanup mission.

2.0 PURPOSE

The purpose of this paper is to describe the Project W-420 upgrade activities, and to show that the upgraded stack monitoring systems will be similar to existing systems in use in TWRS facilities and functionally identical to what is described in the safety bases for the affected facilities. Therefore, the current TWRS Standards/Requirements Identification Document (S/RID) is sufficient to cover the project and no new S/RID requirements are needed as a result of Project W-420.

Additionally, Project W-420 hereby requests that the S/RID functional area Facility Experts (FEs) signify their concurrence with the above conclusions by signing the distribution sheet attached to this document.

3.0 TWRS S/RID

A S/RID lists the environmental, safety, and health standards and requirements for a specific location or site. The requirements necessary to ensure safe operations at TWRS facilities are contained in WHC-SD-MP-SRID-001, High Level Waste Storage Tank Farms/242-A Evaporator Standards and Requirements Identification Document. This S/RID applies to most TWRS organizations and facilities including Single Shell Tanks, Double Shell Tanks, Double-Contained Receiver Tanks (DCRTs) and the existing ventilation stack monitoring systems that are being upgraded by the project. Therefore, the referenced TWRS S/RID applies to the general scope and activities planned for Project W-420.

4.0 TECHNICAL DESCRIPTION OF EXISTING STACK MONITORING SYSTEMS AND PROPOSED PROJECT W-420 UPGRADES

Project W-420 will upgrade existing ventilation exhaust stacks to meet National Emission Standards for Hazardous Air Pollutants (NESHAP), Title 40 CFR, Part 61, Subpart H requirements. The following six stacks in Hanford's 200 East and 200 West Tank Farms will be involved in the planned modifications:

- 296-A-25, 244-A Double Contained Receiver Tank (DCRT) and Annulus Stack;
- 296-B-28, 244-BX DCRT and Annulus Stack;
- 296-C-05, 244-CR Vault Ventilation Stack;
- 296-P-16, 241-C-105 and -106 Primary Tank Exhauster Stack;
- 296-S-22, 244-S DCRT and Annulus Stack; and
296-T-18, 244-TX DCRT and Annulus Stack.

The project will upgrade existing ventilation exhaust stacks and stack monitoring systems. These systems are generically described in the TWRS Authorization Basis (Sec. 2.1.1.20 and B2.7.2.1 of HNF-SD-WM-BIO-001, TWRS Basis for Interim Operation, Rev. 1) as consisting of:

- A record sampler (i.e., filter holder) to quantify emissions for regulatory purposes.
- A stack continuous air monitor (CAM) which detects sudden changes in stack emissions and triggers safety related alarms and interlocks for safety purposes as required by the facility Authorization Basis. The CAM may be specific to either beta or alpha particulate (or both types may be used on the same system).
- A stack CAM interlock which shuts down the exhaust fan upon detecting high stack radiation; high stack radiation indicates a probable filter breach, possibly the result of a spray leak accident, and in such an event the safe condition for these systems is off.
- One or more sample probes to collect a representative sample from the exhaust stack airstream.
- Sample transport tubing to convey the sample to the monitoring equipment (record sampler and CAMs) and return it to the stack.
- A vacuum system (i.e., pumps) to draw the sample, and a system to measure and regulate sample flow.
- Associated instrumentation to ensure the system operates reliably, to notify an operator in case of problems, and to provide some data collection capabilities.
- An exhaust stack providing an elevated discharge point for the ventilation exhaust, as well as physical support for some of the stack monitoring equipment.

The above description will apply equally to the upgraded systems. Project W-420 will replace much of the above equipment in the affected facilities, with updated, commercially available technology that has been successfully tested and used elsewhere onsite. The new equipment will provide the same safety functions and the same level of control as credited in existing safety analyses for the affected facilities, and no changes to the Authorization Basis as a result of project activities. There will be some improvements in reliability, maintainability, and other areas, and the completed upgrades will enable improved stack effluent monitoring, further minimizing the risk of exposure to the public and onsite workers. The following discussion addresses these improvements.

The upgraded record sampler (filter holder) will be fully compliant with National Emission Standards for Hazardous Air Pollutants (NESHAP) as implemented in 40 CFR 61, as well as applicable state environmental regulations; the existing record samplers are not fully compliant. This upgrade is mandated by a compliance agreement between DOE-RL and the EPA. In addition, the new design will utilize a shrouded single-point sample collection probe. This represents a newer technology than the isokinetic "rake" design found in many existing stacks. This technology is approved by the EPA and enables improved sampling efficiency over wider range of stack flows. Shrouded probes have been installed and successfully applied in the Hanford 200 Areas, on portable exhausters used to support saltwell pumping of waste tanks, as well as the new B-Plant (Project W-059) and Canister Storage Building ventilation stacks. The record sampler, sample probe, and sample transport systems will satisfy the requirements of
ANSI N13.1 and other applicable industry consensus standards for radiological effluent monitoring.

The upgraded systems will feature current model, Eberline "AMS-4" particulate beta CAMs. This is the site standard for all new particulate beta CAMs, being as it is supported by extensive onsite testing and operating experience in similar systems (including other TWRS ventilation systems), as well as by existing O&M procedures and spare parts inventories. In most of the affected facilities, this will represent an upgrade from an older CAM, and will provide the same safety related functions as described above but will ensure greater accuracy and more reliable operation. The AMS-4 is the only CAM currently certified by onsite testing as meeting the requirements of ANSI 42.18. The CAMs will be connected to existing fan interlocks to function in a fail-safe manner and support Authorization Basis controls.

Based on an evaluation of the existing exhaust stacks it was decided to replace the stacks on five of the six affected facilities. The replacement stacks will provide the same functions listed above for the existing stacks, but will be fully compliant with current requirements for locations of instrumentation and sampling ports. Also, the replacement stacks (or mock-ups thereof) will be shop-tested prior to installation to ensure performance criteria can be met as prescribed in the regulations and industry codes (e.g., 40 CFR 60, ANSI N13.1). One existing stack (244-CR) will remain in place but will be modified in the field with additional ports to comply with current requirements. All six stacks will be further qualified by testing in the field, following installation.

The upgraded systems will be capable of supporting all present data collection needs for local indication (e.g., during operators rounds) of stack flow rate, stack total flow, stack air stream conditions, radiation counts, etc. They will also feature enhanced data collection capabilities. These will include some data storage and diagnostic capabilities, as well as a standardized communications interface that is compatible with the existing Tank Monitoring and Control System (TMACS). The upgraded systems will thereby facilitate remote communication in addition to supporting local readouts.

Electrical equipment will meet applicable National Electrical Code (NFPA 70) requirements. The upgraded systems and equipment will provide for safety of maintenance personnel and operators, and will comply with applicable occupational safety and health requirements.

Construction and testing activities will follow established site practices, and be controlled by Job Control System (JCS) work packages. Work practices will include provisions for radiological control, hoisting and rigging, and other areas of construction safety. Construction will be supported by necessary permits, including site specific permits (excavation, dome loading, etc.) and regulatory permits (e.g., Notice of Construction, dangerous waste permits).

5.0 PROJECT W-420 INTENT AND COMPLIANCE STATEMENT

Equipment upgraded by Project W-420 will be used to perform continuous, routine monitoring of ventilation stack effluents. No new processes are being introduced, rather existing structures, systems, and components (SSCs) are being upgraded with newer equipment. Modifications to the affected facilities will utilize technologies that are common at the Hanford site and successfully used
elsewhere in TWRS, with a design based on existing industry consensus codes, standards, and regulations, and will rely on commercially available equipment.

Compliance Statement:

Stack monitoring utilizing the pre-existing systems was evaluated during development of the TWRS S/RID. Given the essentially identical function and similar technology of the Project W-420 upgrades, this equipment falls within the bounds of the existing S/RID and no new requirements are necessary.