U.S. Department of Energy
Office of River Protection
P.O. Box 450, MSIN H6-60
Richland, Washington 99352

07-WTP-327

JAN 22 2008

Mr. L. J. Simmons, Project Manager
Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

Dear Mr. Simmons:

CONTRACT NO. DE-AC27-01RV14136 – DESIGN OVERSIGHT ASSESSMENT REPORT D-07-DESIGN-052 FINDING REPLY REQUESTED

References:
1. River Protection Project – Waste Treatment Plant Safety Requirements Document Volume II, 24590-WTP-SRD-ESH-01-001-02, Rev 4b, Section 4.5, "Fire Protection."
2. DOE Standard, "Fire Protection Design Criteria," DOE-STD-1066-97, dated March 1997.

The compliance gap regarding Safety Requirement Document, Safety Criteria 4.5 (Reference 1) implementing code and standard DOE-STD-1066 (Reference 2) is of serious concern, as it represents a significant cost and schedule risk to the project. The attached assessment report identifies the Finding, while recognizing the Project for proactively managing the matter via 24590-WTP-CRPT-QA-07-066. However, the Authorization Basis Amendment Request (ABAR) forecast date has now slipped six months past the original forecast.

A reply is requested within 30 calendar days of the date of letter. This reply will include:

1. Extent of condition regarding all design documents that are currently out of compliance with the standard. This should include an assessment as to which documents are issued for procurement or construction (including subcontractors), and the associated level of risk should procurement or construction proceed.

2. Status of any remaining analysis work that is planned to continue after submittal of the ABAR, with forecast delivery date of the revised ABAR.

3. A Rough Order of Magnitude estimate to bring the design into compliance with the standard. (Assume for the purpose of this estimate that C2 and C3 High-Efficiency Particulate Air are not final filters because they are in place to satisfy Washington Administrative Code 246-247 requirements rather than for nuclear safety.)

4. A trend with estimate to implement the controls proposed in the ABAR.

If you have any questions, please contact me, or your staff may contact James H. Wicks, Director, WTP Engineering Division, (509) 376-3522.

Sincerely,

John R. Eschenberg, Project Manager
Waste Treatment and Immobilization Plant Project

WTP:END

Attachment

cc w/attach:
BNI Correspondence

U.S. Department of Energy, Office of River Protection

DESIGN PRODUCT OVERSIGHT REPORT

REVIEW OF THE WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP) CONFINEMENT VENTILATION SYSTEMS

DECEMBER 2007

DESIGN OVERSIGHT: D-07-DESIGN-052

Team Lead: Jim J. Davis
Team Co-Lead: Kristopher D. Thomas
Reviewers: Jan Fretthold, Elaine Diaz

Submitted by: Robert W. Griffith for JJD — 1/10/08
Jim J. Davis, Mechanical Systems SSO
WTP Engineering Division (WED)
Date

Co-Team Lead: — 1/10/08
Kristopher D. Thomas, WED
Date

Concurrence: James H. Wicks — 22 Jan 2008
James H. Wicks, Director, WED
Date

Approval: — 1/22/08
John R. Eschenberg, Project Manager
Waste Treatment and Immobilization Plant
Date

EXECUTIVE SUMMARY

The U.S. Department of Energy, Office of River Protection, Waste Treatment and Immobilization Plant (WTP) Project conducted a design oversight to:

1. Identify and understand the technical requirements imposed on and selected by the WTP Contractor for designing the confinement ventilation systems for the WTP Project Pretreatment, High-Level Waste Vitrification, and Low-Activity Waste Vitrification Facilities, Analytical Laboratory, and Balance of Facilities.
2. Identify and understand the applicable processes, procedures, codes, standards etc. used by the WTP Contractor's Engineering organization for preparing the design.
3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design of the WTP confinement ventilation systems are being appropriately addressed.

This design oversight scope originally included the offgas handling systems. However, the scope was limited to the confinement ventilation systems (C2, C3, and C5) due to the time available for the review and the number of documents to be reviewed. A separate assessment of melter offgas handling systems will be performed in fiscal year 2008.

The Design Oversight Team concluded that the process for producing the confinement ventilation systems design was satisfactory. It complied with the appropriate technical and contractual requirements and followed the required processes and procedures. The review confirmed that the Contractor's design process effectively implemented applicable technical requirements (codes, standards, and system design handbooks) for the design of the WTP confinement ventilation systems (with some noted exceptions for which Authorization Basis Amendment Requests are underway or corrective actions are being implemented) to ensure long-term operability and optimal life-cycle cost of WTP.

This design oversight identified one Finding and one Assessment Follow-up Item:

- D-07-DESIGN-052-F01: The Finding identified was a non-compliance with the requirements of DOE-STD-1066-97, *Fire Protection Design Criteria.* The WTP ventilation design lacked fire protection features required by DOE-STD-1066, an SRD implementing standard. Modifications necessary to comply with the standard represented significant project cost and schedule risk. The resolution forecast was captured by the Contractor under 24590-WTP-CRPT-QA-07-066, but the forecast for resolution had slipped several times, for a total six-month delay. This issue requires additional management focus to effectively resolve the issue.
- D-07-DESIGN-052-A01: The Assessment Follow-up Item addressed a possible inconsistency between ventilation zone differential pressures and the National Fire Protection Association (NFPA) Life Safety Code requirement for door egress. Resolution actions for this issue were captured by the Contractor under 24590-WTP-ATS-QAIS-07-1265. There were several possible solutions, none of which represented significant cost or schedule risk to the project.

Both the Finding and Assessment Follow-up Item address fire safety requirements that impact ventilation systems design. It is recommended that the Contractor carefully review the ventilation systems design to ensure fire safety requirements have been addressed throughout.

TABLE OF CONTENTS

LIST OF TERMS

ABAR	Authorization Basis Amendment Request
AHU	air handling unit
APC	additional protection class
ASME	American Society of Mechanical Engineers
BNI	Bechtel National, Inc.
BOD	Basis of Design
CM	commercial material
DOE	U.S. Department of Energy
DTD	Decision to Deviate
FCU	fan coil unit
HEPA	high-efficiency particulate air
HLW	High-Level Waste [Facility]
HVAC	heating, ventilating, and air conditioning
ITS	important-to-safety
LAB	Analytical Laboratory
LAW	Low-Activity Waste [Facility]
NFPA	National Fire Protection Association
NQA	Nuclear Quality Assurance
ORP	Office of River Protection
PJM	pulse jet mixer
PSAR	Preliminary Safety Analysis Report
PT	Pretreatment [Facility]
SC	safety class
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SRD	Safety Requirement Document
SS	safety significant
UPS	uninterruptible power supply
V&ID	ventilation and instrumentation diagram
WAC	Washington Administrative Code
WED	WTP Engineering Division
WTP	Waste Treatment and Immobilization Plant

1.0 INTRODUCTION

A major component of the U.S. Department of Energy (DOE), Office of River Protection (ORP) mission is the design and construction of the Waste Treatment and Immobilization Plant (WTP) in the 200 East Area of the Hanford Site. The design and construction contractor for the WTP is Bechtel National, Inc (BNI). As part of its oversight responsibilities, ORP performs various assessments of BNI activities during the design and construction phase. One type of assessment is the design review of various systems, called a Design Oversight, performed by the WTP Engineering Division (WED).

This Design Oversight focused on the design of the confinement ventilation systems. The formal phase of the Design Oversight occurred in September 2007 and consisted of BNI staff interviews, document reviews, and fact finding. The Assessment Team pursued clarification and elaboration of the initial information through the end of December and prepared this report. BNI has informally reviewed the preliminary report for factual accuracy before WED issued the final report. There was one Finding and one Assessment Follow-up Item identified by the team.

2.0 BACKGROUND

Conventional ventilation systems provide many functions; primarily heating, cooling, and humidity control for human comfort and equipment protection, heat removal, and gas and odor control. Controlling the release of radioactive contaminants and hazardous chemical contaminants is a significant objective in the WTP design. This is accomplished through a defense-in-depth approach by a series of redundant confinement barriers with varying degrees of robustness.

The most robust, primary confinement consists of the process enclosures and their respective ventilation systems. For example, in the High-Level Waste (HLW) Facility, the melter and its associated offgas system comprise a primary confinement system. Similarly, the various waste handling vessels and their associated ventilation system comprise another primary confinement system. Since these systems handle radioactive wastes and other hazardous chemicals, the facility enclosures that contain the melter and waste vessels are also considered part of the primary containment system, and are labeled "C5" contamination zones. For example, in HLW, the melter cave walls and associated C5 exhaust ventilation ductwork provide primary confinement.

Secondary confinement zones are those that are ordinarily free of contamination, but have the potential for being contaminated, and are labeled "C3" contamination zones. The secondary confinement systems help prevent the escape of radioactive contamination and other hazardous chemical contaminants into the facility work areas and the environment in the event of failure of the primary confinement.

The tertiary or final confinement zones are those that are not expected to experience contamination but have a small potential to become contaminated because they interface with potentially contaminated zones. They are bounded by the building walls, roof, floor, and associated exhaust ventilation systems, and are labeled "C2" contamination zones.

Uncontrolled areas within the facility that provide no confinement function include office and support areas, and are labeled "C1" ventilation zones. They have no potential to be

contaminated because they have no interfaces with contaminated or potentially contaminated areas of the facility. The C1 zones operate independently from the C2, C3, and C5 zones, like conventional heating, ventilating, and air conditioning (HVAC) systems, with outside air supplied by air handling units (AHU), but with no confinement exhaust fans or high-efficiency particulate air (HEPA) filters.

A common design approach for controlling contamination is the assurance that air flow will occur from the least contaminated (C2) zones to the most contaminated (C5) zones, called "cascading air flow." This is accomplished by controlling the pressures within each zone such that C2 is lower than outside, C3 is lower than C2, and C5 is lower than C3. (Note: there is no zone labeled "C4"; rather, it is combined with the C5 zone.) The melter offgas, vessel vent, and pulse jet mixer (PJM) vent systems all operate at lower pressures than C5.

Fresh outside air is drawn in and conditioned by AHUs, then distributed throughout the C2 zone, and parts of the C3 zone. Much of the air from C2 cascades to C3, but there is more C2 air required for heat removal than for confinement control, so some of the C2 air is exhausted directly from the C2 zone. Similarly, much of the air from C3 cascades to C5, but again there is more C3 air required for heat removal than for confinement control, so some of the C3 air is exhausted directly from the C3 zone. Most of the air from C5 is exhausted directly from the C5 zone, but some C5 air cascades to the melter offgas, vessel vent, and/or PJM vent systems. Before exhausting this air to the outside, it is treated via HEPA filters to remove potential contamination. The melter offgas and vessel vent air is also treated by other means to remove or neutralize volatile organic compounds, nitrogen oxide (NO_x) and acid gases, solid particulate, liquid droplets, and mists.

The two primary considerations in designing the ventilation systems are heat removal and contamination confinement. In the first case, the heat loads and locations are determined to calculate the required air distribution and flow rates. In the second case, the leakage path sizes and required face velocities are determined to calculate the air distribution and flow rates. Consideration is also given to ventilation requirements specific to areas where chemicals are stored and to density changes due to heat loads associated with melter caves. The most conservative air distribution and flow rate combinations are selected to calculate the fan sizes, HEPA filter sizes, and duct routing and sizes. The ancillary equipment is sized in a similar way, although other factors might contribute.

Based on this information, the ventilation and instrumentation diagrams (V&ID) are drawn, the equipment is specified, equipment location and orthographic routing drawings are prepared, and the physical design proceeds. The equipment and materials are purchased and installed; the system is tested, balanced, and placed into service.

3.0 OBJECTIVES, SCOPE AND APPROACH

3.1 Objectives

The primary objectives of this oversight activity were to:

1. Identify and understand the technical requirements imposed on and selected by the Contractor for performing the design of the WTP confinement ventilation systems.

2. Identify and understand the applicable processes, procedures, codes, standards, etc. used by the Contractor for performing the design of the WTP confinement ventilation systems.
3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design of the WTP confinement ventilation systems are being appropriately addressed.

A copy of the oversite plan is included as Appendix B.

3.2 Scope

ORP conducted this oversight assessment within the guidelines of ORP M 220.1, *Integrated Assessment Plan*, Rev. 4, and the ORP DI 220.1, "Conduct of Design Oversight," Rev. 1, issued January 26, 2006. This design oversight included review of the design processes and a sampling of the design products produced to date in support of the topic under review. This included procedures, calculations, deliverables, and other documents that describe the applicable processes and products. Assessment questions posed to contractor technical points of contact, and associated answers, are attached as Appendix A. The Design Oversight Plan is provided in Appendix B.

3.3 Approach

This Design Oversight Team reviewed BNI design processes and products for the flowdown of requirements for the design of WTP confinement ventilation systems. These requirements are captured within the following project documents and industry codes and standards:

- Contract No. DE-AC27-01RL14136, Section C, "Statement of Work," Standard 3, "Design," Section (c)(15), Facility Ventilation System Design: "The Contractor shall prepare the ventilation flow diagrams and heating, ventilation and air conditioning system design for the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and balance of facilities. The diagrams shall identify the individual systems, all equipment components, and flows in the facilities. Sample locations and methods shall be specified. Equipment to provide motive force and ventilation control shall be identified."
- Safety Requirements Document (SRD): Safety Criterion 4.4-3, Applicable Project Phases – Design and Construction, Ventilation Systems and Off-Gas Systems; and Appendix C-35
- Basis of Design (BOD): Section 12, "Ventilation Basis of Design"
- Relevant codes and standards (as listed in the SRD and BOD)
- Task orders or requisitions, specifications, and datasheets
- Vendor submittals
- Shop/receipt inspections, etc.

4.0 RESULTS

The Design Oversight Team performed a comprehensive technical assessment of the BNI design processes and products associated with WTP confinement ventilation systems. This assessment involved extensive document review (see Section 6.0) and interviews with cognizant ORP and BNI personnel. The following sections discuss the significant conclusions reached during the course of the assessment.

4.1. With one notable exception as discussed in Section 5.1, the technical requirements for designing the WTP confinement ventilation systems are adequately specified and consistent with applicable industry codes and standards (e.g., American Society of Mechanical Engineers [ASME] AG-1-1997 with ASME AG-1a-2000 Addenda, *Code on Nuclear Air and Gas Treatment*, and other documents listed in the BOD, Section 12, or in the combined ventilation system descriptions; see Section 6.0 for a complete list). In addition, the descriptions of the credited safety functions and relevant functional requirements for important-to-safety (ITS) confinement ventilation systems, as provided in the Preliminary Safety Analysis Reports (PSAR), Section 4, and the Safety Envelope Documents, are consistent with the functions/functional requirements for nuclear-grade ventilation systems used in both commercial nuclear and high-hazard federal facilities.

4.2. The processes, procedures, etc. used by the Contractor for preparing the design of the confinement ventilation systems are further implemented by department and discipline procedures, vendor submittals, and specifications (see Section 6.0). These processes and procedures were found to be consistent with similar design documentation used for commercial nuclear and other high-hazard federal facilities.

4.3. The Design Oversight Team sampled WTP confinement ventilation design products to confirm the design processes were effective in implementing the technical requirements, and that the principal factors affecting the design of these systems were being appropriately addressed. Based on this sampling review, the Design Oversight Team concluded:

1. The HVAC cascade system designs for C1, C2, C3, and C5 are consistent for the Pretreatment (PT), Low-Activity Waste (LAW), and the HLW Facilities. The exception is in the Analytical Laboratory (LAB) where a passive safe shutdown confinement strategy is used. No issues were identified for these cascade system designs or the LAB passive confinement system. Confinement ventilation system designs were found to be consistently documented using:

   - HVAC system descriptions (HLW and PTF have a separate system description for each ventilation zone, while LAW and LAB have combined ventilation system descriptions for the facility. It was noted that the HLW and PTF system descriptions require updating.)
   - Ventilation flow diagrams and V&IDs.
   - Equipment sizes and locations were documented by BNI Plant Design on equipment location plan drawings for the following confinement ventilation systems and subsystems:

- C1V Ventilation System
  - Air Distribution Ductwork
  - Local Exhaust Fans
  - Office Areas/Change Rooms AHUs
  - Control Rooms/Computer Rooms AHUs
  - Electrical Services Area AHUs
  - Split Unit Direct Expansion Fan Coil Units (FCU) for ITS Switchgear and Uninterruptible Power Supply (UPS)/Battery Rooms
- C2V Ventilation System
  - C2V Supply Air System
    - C2V Supply Air AHUs
    - C2V FCUs
    - Supply Air Distribution Ductwork
    - Electrical Unit Heaters
  - C2V Exhaust Air System
    - C2V Exhaust Fans
    - C2V Exhaust HEPA Filters and Housings
    - C2V Exhaust Ductwork
- C3V Ventilation System
  - C3V Cascade Exhaust Air System
    - C3V Exhaust Fans
    - C3V Exhaust HEPA Filters and Housings
    - C3V FCUs
    - C3V Exhaust Ductwork to Filters and Fan
  - C3V Canister Storage Exhaust Air System
    - C3V Canister Storage Supply AHUs
    - C3V Canister Storage Exhaust HEPA Filters and Housings
    - C3V Canister Storage Exhaust Fans
    - C3V Canister Storage Exhaust Ductwork
  - C3V Decontamination Booth/Glovebox Exhaust Air System
    - C3V Exhaust Fans
    - C3V Exhaust HEPA Filters and Housings
    - C3V Exhaust Ductwork to Filters
- C5V Ventilation System
  - C5V Inbleed System
  - C5V Exhaust Air System
  - C5V Exhaust Fans
  - C5V Exhaust HEPA Filters and Housings
  - C5V Exhaust Ductwork

2. In the HLW and PT Facilities, the C5 Area Ventilation exhaust system (ductwork, filters, housings, and fans) is safety class (SC); it is powered off the ITS electrical busses for trains A and B. There is an SC thermostatically-controlled, stand-by split-unit air conditioner for each of the two trains of the ITS Battery and UPS rooms, powered off the respective ITS electrical busses. The HLW C3 Canister Storage Area

ventilation exhaust system (ductwork, filters, housings, and fans) is safety significant (SS). The C2 and C3 Area ventilation exhaust systems are commercial grade, with the exception of the HEPA filters and housings, which are Air Permit non-ITS. The Air Permit quality level invokes Nuclear Quality Assurance (NQA)-1 to meet the requirements of Washington Administrative Code (WAC) 246-247[1], but is typically associated with a non-ITS or additional protection class (APC) safety classification of equipment, which would otherwise be assigned a "commercial material (CM)" quality level and purchased commercial grade. These safety classifications were determined to be consistent with project safety analyses and requirements documents (e.g., the PSARs, SRD, and BOD).

3. As noted previously, the two main functions of the HVAC systems at WTP are contamination confinement and temperature control.

   - The air supply and exhaust fans are controlled to ensure contamination confinement by maintaining a steady cascading air flow from low-contamination zones to high-contamination zones. Successive zones are controlled at decreasing pressures below atmospheric. Pressure sensors, referenced to the outside ambient air pressure, control the number and speed of C2 and C3 air supply fans, with C2 and C3 exhaust fans controlled to provided constant flow. The C5 zone exhaust fans are also controlled to maintain zone pressure relative to atmosphere. Zones are interlocked to shut down exhaust fans in less contaminated spaces upon failure of the C5 exhaust fans to prevent backflow. (The Authorization Basis Amendment Request (ABAR) to add this feature in the HLW facility is currently in review.)

   - Temperature is controlled by thermostats that modulate hot water/steam and cooling water/chilled water for heating the general air supply in the AHUs, local heating and cooling in FCUs and unit heaters, and cooling in inbleed assemblies.

4. The design of the WTP confinement ventilation systems contains sufficient quantities of inbleeds in appropriate locations to support system operation. The use of fire/ smoke dampers, most of which include cooling coils in these systems, provides adequate isolation of areas experiencing potential fire events without unduly compromising continued C5V ventilation system operation. However, there is an unresolved Life Safety Code issue stemming from the inbleed design, as discussed further in section 5.2.

5. The Design Oversight Team concluded the use of the following ductwork types was appropriate for the required process and safety functions:

   - The C1V ductwork is constructed from galvanized carbon steel, designed, fabricated, and installed in accordance with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) standards.

   - The C2V and C3V ductwork is all welded, galvanized carbon steel, designed, fabricated, and installed in accordance with SMACNA standards, and supported to Seismic Category III and IV specifications.

[1] WAC 246-247, "Radiation Protection – Air Emissions," *Washington Administrative Code*, as amended

- The C5V ductwork is all welded stainless steel, designed, fabricated, and constructed in accordance with ASME, Standard AG-1, Section SA, and supported to Seismic Category I and II specifications (Seismic III in LAW and LAB).

6. The flow/balance/isolation control scheme embodied in the WTP confinement ventilation systems design and documented in the LAW and LAB combined ventilation system descriptions is appropriate. The PTF and HLW ventilation system descriptions require updating once the design calculations are complete.
7. The Design Oversight Team concluded that the design of WTP confinement ventilation systems would accomplish the intended contamination confinement and temperature control functions.

5.0 OPEN ITEMS AND RECOMMENDATIONS

The Design Oversight Team identified one Finding and one Assessment Follow-up Item. The Contractor is currently working to resolve these two issues regarding the design interface between the fire protection features of the design and the ventilation systems.

5.1 Finding D-07-DESIGN-052-F01

The current WTP ventilation design lacks fire protection features required by the SRD implementing standard, DOE-STD-1066-97, *Fire Protection Design Criteria*. Some examples of these features include automatic and manual deluge systems, fire screens, viewing ports, drains, two stages of filters, and standby filters required to be in a separate fire areas.

To document the noncompliance and track resolution, the Contractor issued corrective action report 24590-WTP-CRPT-QA-07-066. The contractor has published a Decision to Deviate (DTD) to procure filter housings without automatic fire suppression piping on the technical basis of low fire loading inventory in the facilities and the inability to transport embers to the filter face in low flow ventilation systems with long duct runs. The DTD also addresses previously procured filter housings that are not compliant with the requirements of the standard. The contractor is now preparing an ABAR to evaluate the safety impact of not including the required fire protection features.

The Contractor originally committed to resolve this issue in September of 2007. However, the ABAR completion forecast has slipped several times, for a total delay of more than six months, due to additional calculations that were not originally anticipated. Because this issue represents significant cost and schedule risk to the project, elevated prioritization and Contractor management focus is needed to address the SRD noncompliance.

5.2 Assessment Follow-up Item D-07-DESIGN-052-A01

Contractor Action Tracking System item 24590-WTP-ATS-QAIS-07-1265 documents an issue regarding a possible inconsistency between ventilation zone differential pressures and the National Fire Protection Association (NFPA) Life Safety Code requirement for door egress. This issue has recently been raised and is being addressed by the Contractor. There are several possible solutions, none of which represent significant cost or schedule risk.

5.3 Recommendations

The Finding and Assessment Follow-up Item address fire safety requirements that impact ventilation systems design. It is recommended that the Contractor review the ventilation systems design to ensure fire safety requirements have been addressed throughout.

Except as noted above, the design is consistent with nuclear codes and standards and ventilation system design recommendations, and the Contractor design process effectively implements all Contract and other applicable technical requirements for the design of the WTP confinement ventilation systems to ensure long-term operability and optimal life cycle cost of WTP.

The team was impressed by the Contractor's level of standardization between facility designs, particularly in the areas of ventilation control and procurement. Standardized equipment and control schemes will greatly simplify operations and reduce the likelihood of operator-error induced events. The HLW and PTF system descriptions need to be updated to reflect this standardized approach upon availability of supporting calculations currently in revision.

6.0 REFERENCES AND PERSONNEL CONTACTED

6.1 Personnel Contacted

John Dick, BNI
Gerard Garcia, BNI
Peter Shea, BNI
Bruce Nicoll, DOE
Wahed Abdul, DOE

6.2 References

6.2.1 General

24590-WTP-DB-ENG-01-001, Rev. 1J, *Basis of Design*

24590-WTP-SRD-ESH-01-001-02, *Safety Requirements Document Vol. II*, Rev. 4, as amended

ASME AG-1, *Code on Nuclear Air and Gas Treatment/with Addenda*, American Society of Mechanical Engineers, New York, New York, as amended

DOE-STD-1066-97, *Fire Protection Design Criteria*, U.S. Department of Energy, Washington D.C., March 1997

ORP DI 220.1, "Conduct of Design Oversight," Rev. 1, January 26, 2006

ORP M 220.1, *Integrated Assessment Plan*, Rev. 4, January 3, 2006

6.2.2 Miscellaneous Informal Submittals

BNI Reports

D-06-DESIGN-036, *Review of Waste Treatment Plant (WTP) Laboratory (LAB) Heating Ventilating and Air Conditioning (HVAC) Systems*, (Analytical Laboratory)

D-06-DESIGN-025, *Review of Contractor Design of the HLW Confinement Ventilation System*, (HLW)

D-06-DESIGN-033, *Standards Flowdown for Round HEPA Filters*, (HEPA Filters-Round)

ORP Memos

WTP:JEO 06-WTP-196, "Submittal of System Evaluation Data on the Active Confinement Systems in the Waste Treatment and Immobilization Plant (WTP), Pretreatment (PT), and High-Level Waste (HLW) Facilities in Response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2," dated December 20, 2006 [(PTF Control Room Habitability) and (Fire Suppression in Filter Plenums)]

WTP:JEO 07-WTP-030, "Submittal of System Evaluation on the Active Confinement Systems in the Waste Treatment and Immobilization Plant (WTP), Pretreatment (PT), and High-Level Waste (HLW) Facilities in Response to Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2," dated February 23, 2007 [(PTF Control Room Habitability) and (Fire Suppression in Filter Plenums)]

6.2.3 Pre-Site Visit Review Documents

BNI System Descriptions

24590-PTF-3YD-1CV-00001, *System Description for PTF System C1 Ventilation System, C1V*

24590-PTF-3YD-2CV-00001, *System Description for PTF C2 Ventilation System, C2V*

24590-PTF-3YD-3CV-00001, *System Description for PTF C3 Ventilation System C3V*

24590-PTF-3YD-5CV-00001, *System Description for PTF C5 Ventilation System, C5V*

24590-LAW-3YD-20-00003, *Combined LAW Ventilation System Description or Systems C1V, C2V, C3V and C5V*

24590-HLW-3YD-C1V-00001, *System Description - System C1V HLW C1 Area Ventilation*

24590-HLW-3YD-C2V-00001, *System Description - System C2V HLW C2 Area Ventilation*

24590-HLW-3YD-C3V-00002, *System Description-System C3V HLW C3 Canister Storage Area Ventilation*

24590-HLW-3YD-C3V-00001, *System Description for System C3V HLW - C3 Cascade Ventilation*

24590-HLW-3YD-C5V-00001, *System Description - System C5V HLW C5 Area Ventilation*

24590-LAB-3YD-60-00001, *Combined Lab Ventilation System Description for Systems C1V, C2V, C3V and C5V*

BNI Supporting Documents

24590-HLW-RPT-ENG-02-003, *WDOH Code Compliance Matrix for HLW HVAC Systems*

24590-LAW-RPT-ENG-02-001, *WDOH Code Compliance Matrix for LAW HVAC Systems*

24590-PTF-RPT-ENG-02-002, *WDOH Code Compliance Matrix for PTF HVAC Systems*

24590-LAB-RPT-ENG-02-001, *WDOH Code Compliance Matrix for LAB HVAC Systems*

24590-WTP-SED-ENS-03-002-04, *Safety Envelope Document; HLW Facility*

24590-WTP-SED-ENS-03-002-03, *Safety Envelope Document; LAW Facility*

24590-WTP-SED-ENS-03-002-02, *Safety Envelope Document; PTF Facility*

24590-WTP-RPT-ENS-05-005, *WTP Preliminary Fire Hazards Analysis General Information*

BNI Drawings

24590-HLW-P1-P01T-00001, *HLW Vitrification Building General Arrangement Plan at El -21'-0"*

24590-HLW-P1-P01T-00002, *HLW Vitrification Building General Arrangement Plan at El 0 Ft- 0 In*

24590-HLW-P1-P01T-00003, *HLW Vitrification Building General Arrangement Plan at El 14 Ft -0 In*

24590-HLW-P1-P01T-00004, *HLW Vitrification Building General Arrangement Plan at El 37- 0"*

24590-HLW-P1-P01T-00005, *HLW Vitrification Building General Arrangement Plan at El 58 Ft -0 In*

24590-HLW-P1-P01T-00006, *HLW Vitrification Building General Arrangement Plan at El 72' - 0"*

24590-HLW-P1-P01T-00007, *HLW Vitrification Building General Arrangement Plan at El 91'- 0"*

24590-HLW-P1-P01T-00008, *HLW Vitrification Building General Arrangement Sections A-A B-B and C-C*

24590-HLW-P1-P01T-00009, *HLW Vitrification Building General Arrangement Sections D-D E-E and F-F*

24590-HLW-P1-P01T-000010, *HLW Vitrification Building General Arrangement Section G-G and H-H*

24590-HLW-P1-P01T-000011, *HLW Vitrification Building General Arrangement Section J-J and K-K*

24590-LAB-M8-C2V-00001001, *Analytical Lab Plant Room V&ID C2V System Supply*

24590-LAB-M8-C2V-00001002, " "

24590-LAB-M8-C2V-00003001 *Analytical Laboratory Plant Room V and ID C2V System Exhaust*

24590-LAB-M8-C2V-00003002, " "

24590-LAB-M8-C3V-00003001, *Analytical Laboratory Plant Room V and ID C3V System Exhaust*

24590-LAB-M8-C3V-00003002, " "

24590-LAB-M8-C3V-00003003, " "

24590-LAB-M8-C5V-00002001, *Analytical Laboratory Plant Room V&ID C5V System Exhaust*

24590-LAB-M8-C5V-00002002, *CANCELLED - Analytical Lab Plant Room V&ID C5V System Exhaust*

24590-LAB-M8-C5V-00002003, *Analytical Laboratory Plant Room V&ID C5V System Exhaust*

24590-LAB-P1-60-00007, *Analytical Laboratory General Arrangement Plan at E (-) 19 Ft – 2In Sections E-E, F-F & G-G*

24590-LAB-P1-60-00008, *Analytical Laboratory General Arrangement Plan at El 0 F - 0 In*

24590-LAB-P1-60-00009, *Analytical Laboratory General Arrangement Plan at El 17 Ft - 0 In*

24590-LAB-P1-60-000010, *Analytical Laboratory General Arrangement Sections A-A B-B C-C and D-D*

24590-LAB-P1-60-000011, *Analytical Laboratory General Arrangement Plan at Roof*

24590-LAB-P1-60-000012, *Analytical Laboratory General Arrangement Partial Plan at El 0 Ft-0 In*

24590-LAW-M8-C2V-00001001, *Pretreatment Facility Plant Room V&ID C2 Exhaust Filters Elevation 98 Feet 0 Inches*

24590-LAW-M8-C2V-00001002, " "

24590-LAW-M8-C2V-00006001, *LAW Vitrification Building Plant Room V&ID C2 Exhaust El. 3-0*

24590-LAW-M8-C2V-00006002, " "

24590-LAW-M8-C2V-00006003, " "

24590-LAW-M8-C3V-00002001, *LAW Vitrification Building Plant Room V&ID C3 Exhaust El. 48*

24590-LAW-M8-C3V-00002002, " "

24590-LAW-M8-C3V-00002003, " "

24590-LAW-M8-C5V-00003001, *LAW Vitrification Building Plant Room V&ID C5 Exhaust System*

24590-LAW-M8-C5V-00003002, " "

24590-LAW-M8-C5V-00003003, " "

24590-LAW-M8-C5V-00003004, " "

24590-LAW-M8-C5V-00003005, " "

24590-LAW-P1-P01T-00001, *LAW Vitrification Building General Arrangement Plan at El. (-) 21 Ft - 0 In*

24590-LAW-P1-P01T-00002, *LAW Vitrification Building General Arrangement Plan at El. 3'-0"*

24590-LAW-P1-P01T-00003, *LAW Vitrification Building General Arrangement Plan at El. 22 Ft - 0 In*

24590-LAW-P1-P01T-00004, *LAW Vitrification Building General Arrangement Plan at El. 28'-0"*

24590-LAW-P1-P01T-00005, *LAW Vitrification Building General Arrangement Plan at El. 48 Ft - 0 In*

24590-LAW-P1-P01T-00006, *LAW Vitrification Building General Arrangement Plan at El 68 Ft. - 0 In.*

24590-LAW-P1-P01T-00007, *LAW Vitrification Building General Arrangement Section A-A B-B C-C and S-S*

24590-LAW-P1-P01T-00008, *LAW Vitrification Building General Arrangement Section D-D E-E F-F and T-T*

24590-LAW-P1-P01T-00009, *LAW Vitrification Building General Arrangement Section G-G H-H and J-J*

24590-LAW-P1-P01T-000010, *LAW Vitrification Building General Arrangement Section K-K L-L and M-M*

24590-LAW-P1-P01T-000011, *LAW Vitrification Building General Arrangement Section N-N P-P R-R and U-U*

24590-LAW-P1-P01T-000012, *LAW Switchgear Building General Arrangement Plan at El. 0 Ft - 0 In*

24590-LAW-P1-P01T-000013, *LAW Switchgear Building General Arrangement Sections*

24590-PTF-M8-C2V-00003001, *Pretreatment Facility Plant Room V&ID C2 Exhaust Filters Elevation 98 Feet 0 Inches*

24590-PTF-M8-C2V-00003002, " "

24590-PTF-M8-C2V-00004, " "

24590-PTF-M8-C3V-00002, *Pretreatment Facility Plant Room V&ID C3 Exhaust Filters Elevation 77 Ft - 0 In*

24590-PTF-M8-C3V-00003, *Pretreatment Facility Plant Room V&ID C3 Exhaust Fans Elevation 98 Ft - 0 In*

24590-PTF-M8-C5V-00002001, *Pretreatment Facility Plant Room V and ID C5 Exhaust Primary Filter Elevation 56 Ft - 0 In*

24590-PTF-M8-C5V-00002002, " "

24590-PTF-M8-C5V-00002003, *Pretreatment Facility Plant Room V and ID C5 Exhaust Secondary Filters Elevation 77 Ft -0 In*

24590-PTF-M8-C5V-00002004, " "

24590-PTF-M8-C5V-00003, *Pretreatment Facility Plant Room V&ID C5 Exhaust Fans Elevation 98 Ft - 0 In*

24590-PTF-M8-C5V-00004001, *Pretreatment Facility Plant Room V and ID C5 In-Bleed Unit Schedule Elev. 0 Ft -0 In And 28 Ft -0 In*

24590-PTF-M8-C5V-00004001, *Pretreatment Facility Plant Room V and ID C5 In-Bleed Unit Schedule Elev. 0 Ft -0 In 28 Ft -0 In 56 Ft -0 In and 77 Ft - 0 In*

24590-PTF-P1-P01T-00001, *Pretreatment Facility General Arrangement Plan at El. 0 Ft-0 In*

24590-PTF-P1-P01T-00002, *Pretreatment Facility General Arrangement Plan at El. 28 Ft-0 In*

24590-PTF-P1-P01T-00003, *Pretreatment Facility General Arrangement Plan at El. 56'-0"*

24590-PTF-P1-P01T-00004, *Pretreatment Facility General Arrangement Plant at El. 77'-0"*

24590-PTF-P1-P01T-00005, *Pretreatment Facility General Arrangement Plan at El. 98'-- 0"*

24590-PTF-P1-P01T-00006, *Pretreatment Facility General Arrangement Plan at El. (-) 45 Ft-0 In*

24590-PTF-P1-P01T-00007, *Pretreatment Facility General Arrangement Section A-A*

24590-PTF-P1-P01T-000020, *Pretreatment Facility General Arrangement Control Building Plan Plan at El. 0 Feet - 0 Inch*

24590-PTF-P1-P01T-000021, *Pretreatment Facility General Arrangement Control Building Sections A thru D*

24590-PTF-P1-P01T-P0001, *Pretreatment Facility General Arrangement Plan at El. 0 Ft-0 In*

24590-PTF-P1-P01T-P0002, *Pretreatment Facility General Arrangement Plan at El. 28 Ft-0 In*

24590-PTF-P1-P01T-P0003, *Pretreatment Facility General Arrangement Plan at El. 56'-0"*

24590-PTF-P1-P01T-P0004, *Pretreatment Facility General Arrangement Plant at El. 77'-0"*

24590-PTF-P1-P01T-P0005, *Pretreatment Facility General Arrangement Plan at El. 98'-- 0"*

24590-PTF-P1-P01T-P0006, *Pretreatment Facility General Arrangement Plan at El. (-) 45 Ft-0 In*

24590-PTF-P1-P01T-P0007, *Pretreatment Facility General Arrangement Section A-A*

24590-PTF-P1-P01T-P0008, *Pretreatment Facility General Arrangement Section B-B*

24590-PTF-P1-P01T-P0009, *Pretreatment Facility General Arrangement Section C-C*

24590-PTF-P1-P01T-P0010, *Pretreatment Facility General Arrangement Section D-D*

24590-PTF-P1-P01T-P0011, *Pretreatment Facility General Arrangement Section E-E*

24590-PTF-P1-P01T-P0012, *Pretreatment Facility General Arrangement Sect. F-F and Sect. G-G*

24590-PTF-P1-P01T-P0013, *Pretreatment Facility General Arrangement Sect. H-H and Sect. J-J*

24590-PTF-P1-P01T-P0014, *Pretreatment Facility General Arrangement Sect. K-K and Sect. L-L*

24590-PTF-P1-P01T-P0015, *Pretreatment Facility General Arrangement Sect. M-M and Sect, N-N*

24590-PTF-P1-P01T-P0016, *Pretreatment Facility General Arrangement Sect. P-P and Section Q-Q*

24590-PTF-P1-P01T-P0017, *Pretreatment Facility General Arrangement Sect. R-R*

BNI Presentations

- PTF Elevations
- HLW IGRIP_SFS
- Mark_M_HLW
- Renderings
- All HVAC 9-3
- B.3 Presentations graphics
- HVAC_HAUDI
- Harshfield-5-2-00 Multi-Discipline Review
- HVAC Fan Control Philosophy
- Low Flow Confinement
- Presentation 92806
- Addition testing request
- 28th Nuclear Air Cleaning & Treatment Conference, "Application of ASME AG-1 to the DOE Hanford Tank Waste Treatment and Immobilization Plant (WTP)

BNI Photos

144-4499_IMG.JPG, 144-4500_IMG.JPG,144-4512_IMG.JPG,144-4513_IMG.JPG,144-4515_IMG.JPG,144-4517_IMG.JPG, 144-4518_IMG.JPG, 144-4520_IMG.JPG

DSCF0146.JPG, DSCF0147.JPG, DSCF0148.JPG, DSCF0149.JPG, DSCF0150.JPG, DSCF0151.JPG, DSCF0152.JPG, DSCF0153.JPG, DSCF0154.JPG, DSCF0155.JPG, DSCF0160.JPG, DSCF0161.JPG, DSCF0162.JPG

BNI Sketches

- C5 Mist Eliminator
- HLW Filter Arrangement
- Parallel Filter Arrangement
- Test hg6 Arrangement
- HLW C5 Arrangement

BNI Purchase Order Submittals

24590-QL-POA-MKH0-00003-03-01, *HEPA Filter*

24590-QL-POA-MKH0-00003-03-09, *HEPA Filter*

24590-QL-POA-MKH0-00002-04-00002, *HEPA Filter Housing Test Report*

24590-QL-POA-MKH0-00002-04-00001, *HEPA Filter Housing Test Report*

24590-QL-POA-MKH0-00001-10-02, *HEPA Filter Housing*

BNI Engineering Specification

24590-WTP-3PS-MKH0-T0002, *Engineering Specification for Nuclear Grade High Efficiency Particulate Air (HEPA) Filters (ASME AG-1 Section FK Filters)*

Appendix A. Questions/Responses for Confinement Ventilation/HEPA Systems

No.	Question	Contractor Response
1	Qualification of 2,000 cfm HEPAs, one or both filter designs (safe change and remote)?	Presently, the HEPA filter specification (24590-WTP-3PS-MKH0-T0002[1]) requires the safe-change, remote and bleed filters to be qualified in accordance with AG-1 Article FK-5000. HEPA qualification is in process.
2	How are the in-bleed filters to be qualified?	In-bleeds use a moderate efficiency filter based on American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) atmospheric dust spot efficiency test (see 24590-WTP-M8-M80T-00001[2]).
3	What is the status of remote housing seismic testing?	Presently, the schedule projects a May 2008 seismic qualification test providing the coupled analysis is complete.
4	What type of HEPA media will be used?	Flanders type DN713, HF, and acid resistant, boron silicate micro fiber.
5	What chemicals are the filters subjected to?	The C2, C3, and C5 ventilation system HEPA filters are not subjected to significant concentrations of chemicals (such as SO_2, NO/NO_2,NO/NO_2,HCl, and HF gases.) These chemicals do occur in some of the offgas systems, and will be detailed in a separate assessment report.
6	What is the normal operating relative humidity and temperature of HEPA filters?	Supply air is 10% to 40% or less during normal operations (see BOD Table 12-1). C5V exhaust header humidity will be monitored in order to detect moisture leaks in the cave. HEPAs will see less than 70% RH.
7	What is the status of remote testing and length of sample lines?	Field testing has not been accomplished at this point for remote filter housings and filtration systems.

[1] 24590-WTP-3PS-MKH0-T0002, *Engineering Specification for Nuclear Grade High Efficiency Particulate Air (HEPA) Filters (ASME AG-1 Section FK Filters)*, Rev. 2, March 8, 2006

[2] 24590-WTP-M8-M80T-00001, *HVAC V&ID Symbols & Legends*, Rev. 3, June 28, 2005

No.	Question	Contractor Response
8	What is the status of bypass leakage testing for remote housing?	Action 24590-WTP-RITS-QAIS-05-017 is in response the Defense Board letter on 4/27-29/04 Ventilation Systems Review. The action states: "During its previous review, the staff noted that bypass leakage around the HEPA units in the C5 ventilation system, which must be maintained remotely, could present a problem. The contractor has looked into the matter and has identified the potential for leakage past dampers, which would bypass one bank of HEPA filters. There is no clear method for measuring this bypass leakage. The contractor has considered three potential test methods for examining leakage during facility startups. The staff will review the test methods as they are finalized. (action due 3/10/2008)."
9	Does the Pretreatment ventilation system have the capacity to handle the additional heat load required by the change in the caustic leaching process?	A definitive answer to this inquiry is not available at this time. The issue is presently in design. However, it is Engineering's goal to minimize the impact to C5V and not increase the system airflow.
10	Is the system (C5V) flow capacity adequate with the melter doors open?	The melter doors for HLW provide an airlock for the melter cave. If both doors are opened at the same time, exceeding 8 square feet leak path into C5 spaces, it will cause a loss of depression with the C5 fans operating at full speed (synchronous speed less slip). The exhaust fan operating at full speed will establish 59,000 cfm flow, satisfying the system flow requirement. The Defense Nuclear Facilities Safety Board (DNFSB) noted that flow control in this application would provide an opportunity to reverse airflow from the C5 space to C2 and C3 boundary spaces. Based on the Board's concern, zone control was switched from airflow to differential pressure.

Appendix B. Design Product Oversight Plan

DESIGN PRODUCT OVERSIGHT PLAN

REVIEW OF THE WASTE TREATMENT AND IMMOBILIZATION PLANT (WTP) CONFINEMENT VENTILATION AND OFFGAS HANDLING SYSTEMS

August 17, 2007

Design Oversight: D-07-DESIGN-052

Team Lead: Jim J Davis

Reviewer(s): Jan Fretthold

Submitted by Team Lead: [original signed by Robert Griffith] August 22, 2007
Jim J Davis, Mechanical Systems SSO Date
Waste Treatment and Immobilization Plant
Engineering Division

Concurrence: _____ _____
Robert Griffith, Acting Director Date
Waste Treatment and Immobilization Plant
Engineering Division

Approval: _____ _____
John R. Eschenberg, Project Manager Date
Waste Treatment and Immobilization Plant

Table of Contents

List of Tables

1.0 Background, Purpose and Objectives

1.1 Background

Conventional ventilation systems provide many functions; primarily heating, cooling, and humidity control for human comfort and equipment protection, heat removal, and gas and odor control. Controlling the release of radioactive contaminants and hazardous chemical contaminants is a significant objective in the design of the Waste Treatment and Immobilization Plant (WTP) . This is accomplished through a defense-in-depth approach by a series of redundant confinement barriers with varying degrees of robustness.

The most robust, primary confinement consists of the process enclosures and their respective ventilation systems. For example, in High Level Waste (HLW) the melter and its associated offgas system comprises a primary confinement system. Similarly, the various waste handling vessels and their associated ventilation system comprise another primary confinement system. Since these systems handle radioactive wastes and other hazardous chemicals, the facility enclosures that contain the melter and waste vessels are also considered part of the primary containment system, and are labeled "C5" ventilation zones. For example, in HLW, the melter cave walls and associated C5 exhaust ventilation ductwork provide primary containment.

Secondary confinement zones are those that are ordinarily free of contamination, but have the potential for being contaminated, and are labeled "C3" ventilation zones. The secondary confinement systems help prevent the escape of radioactive contamination and other hazardous chemical contaminants into the facility work areas and the environment in the event of failure of the primary confinement.

The tertiary or final confinement zones are those that are not expected to experience contamination but have a small potential to become contaminated because they interface with those that do. They are bounded by the building walls, roof, floor, and associated exhaust ventilation systems, and are labeled "C2" ventilation zones.

Uncontrolled areas within the facility that provide no confinement function include office and support areas, and are labeled "C1" ventilation zones. They have no potential to be contaminated because they have no interfaces with contaminated or potentially contaminated areas of the facility. The C1 zones operate independently from the C2, C3, or C5 zones, at positive pressure like conventional Heating, Ventilating, and Air Conditioning (HVAC) systems, with outside air supplied by Air Handling Units (AHU) but no confinement exhaust fans or High Efficiency Particulate Air (HEPA) filters.

A common design approach for controlling contamination is the assurance that air flow will occur from the least contaminated (C2) zones to the most contaminated (C5) zones, called "cascading air flow." This is accomplished by controlling the pressures within each zone such that C2 is lower than outside, C3 is lower than C2, and C5 is lower than C3. (Note there is no zone labeled "C4"; rather, it is combined with the C5 zone.) The melter offgas, vessel vent, and PJM vent systems operate at lower pressures than C5.

In practice, fresh outside air is drawn in and conditioned by Air Handling Units, then distributed throughout the C2 zone, and parts of the C3 zone. Much of the air from C2 cascades to C3, but there is more C2 air required for heat removal than for confinement control, so some of the C2 air is exhausted directly from the C2 zone. Similarly, much of the air from C3 cascades to C5, but again there is more C3 air required for heat removal than for confinement control, so some of the C3 air is exhausted directly from the C3 zone. Most of the air from C5 is exhausted directly from the C5 zone, but some C5 air cascades to the melter offgas, vessel vent, and/or Pulse Jet Mixer (PJM) vent systems. Before exhausting the contaminated air to the outside it is sucked through HEPA filters to remove the contamination. The most contaminated C5, melter offgas, and vessel vent air is sucked through two sequential banks of HEPA filters for redundancy. The melter offgas and vessel vent air is also treated by other processes such as submerged bed scrubbers (offgas only), wet electrostatic precipitators (offgas only), and high-efficiency mist eliminators upstream of the HEPA filters and secondary offgas processing downstream.

The two primary considerations in designing the ventilation systems are heat removal and contamination confinement. In the first case, the heat loads and locations are determined, to calculate the required air distribution and flow rates. In the second case the leakage path sizes and required face velocities, are determined to calculate the air distribution and flow rates. Then the most limiting air distribution and flow rate combinations are selected to calculate the fan sizes, HEPA filter sizes, and duct routing and sizes. The ancillary equipment is sized in a similar way; although, other factors might contribute.

Based on this information, the ventilation and instrumentation diagrams (V&IDs) are drawn up and the equipment is specified, equipment location and orthographic routing drawings are prepared, and the physical design proceeds. The equipment and materials are purchased and installed, the system is tested, balanced, and placed into service.

1.2 Purpose

The purposes of this review is to confirm that the Contractor design process effectively implements all Contract and other applicable technical requirements for the design activity under review to ensure long-term operability and optimal life cycle cost of WTP.

1.3 Objectives

1. Identify and understand the technical requirements imposed on and selected by the Contractor for performing the design activity under review.

2. Identify and understand the applicable processes, procedures, guides, etc. used by the Contractor for performing the design activity under review.

3. Evaluate a sampling of the design products to confirm the processes are effective in implementing the technical requirements, and that the principal factors affecting the design activity under review are being appropriately addressed.

2.0 Process

This oversight shall be conducted within the guidelines of ORP PD 220.12, issued February 12, 2003, "Conduct of Design Oversight".

2.1 Scope

This oversight will include review of the design processes and the design products produced to date in support of the topic under review. This will include procedures, calculations, deliverables, and other documents that describe the applicable processes and products.

This oversight will review the flowdown of the relevant standards for nuclear air handling systems including:

- Contract: Section C "Statement of Work," (c) "Design," (15) Facility Ventilation System Design: The Contractor shall prepare the ventilation flow diagrams and heating, ventilation and air conditioning system design for the Pretreatment, HLW Vitrification, LAW Vitrification, Analytical Laboratory, and balance of facilities. The diagrams shall identify the individual systems, all equipment components, and flows in the facilities. Sample locations and methods shall be specified. Equipment to provide motive force and ventilation control shall be identified.

- Safety Requirements Document: Safety Criterion 4.4-3, Applicable Project Phases – Design and Construction, Ventilation Systems and Off-Gas systems; and Appendix C-35

- Basis of Design: Section 12, Ventilation Basis of Design;

- Relevant Codes and Standards;

- Specification(s): To be identified and reviewed by this assessment.

- Vendor Submittals

- Shop/Receipt Inspections, etc

2.2 Preparation

1. Identify the Contractor Point of Contact for the Review.

2. Establish the scope and elements of the design processes and deliverables under review.

3. Identify and review the applicable Contract and requirements source documents.

4. Review background information as provided by Contractor and identified through review of available databases.

5. Review previously performed Contractor design review reports, documentation, open issues, and the plans for and status of their resolution.

6. Review the applicable design processes and a sample of the resulting design deliverables.

7. Table 1 lists information requested from the Contractor to initiate this oversight.

2.3 Review and identify, resolve or document issues

Evaluate the selected attributes and develop lines of inquiry and specific questions that are then explored with cognizant Contractor personnel to meet the oversight objectives. This phase will be documented in summary tables as shown in ORP PD 220.12, issued February 12, 2003, "Conduct of Design Oversight," Attachment 9.4, Appendix A. This effort will include participating in any applicable internal Contractor reviews and discussions. The output from this phase of the oversight will be a completed summary table with Contractor responses to the questions and lines of inquiry and a list of remaining open issues that need further evaluation by Contractor for resolution.

2.4 Reporting

De-brief U.S. Department of Energy, Office of River Protection (ORP) and Contractor management periodically as required. Prepare a draft report that summarizes the activities, the results, conclusions and recommendations of the review. Issue the Draft Design Oversight Report for review and comment by ORP management and cognizant Contractor personnel. The final report resolves comments received on the draft report.

3.0 Schedule of Activities

Table 2 summarizes the schedule for completion of this oversight.

4.0 Documentation

The final report of this task shall contain the sections and content as summarized in ORP PD 220.12, issued February 12, 2003, "Conduct of Design Oversight," Attachment 9.4, "Design Oversight Report Outline."

The open issues identified in this oversight shall be listed in the final report. Each open issue shall be assigned an item number and shall be tracked to resolution through the ORP Consolidated Action Reporting System (CARS). These shall also be tracked to resolution by the Contractor through his Correspondence Control Number (CCN) that will be assigned to the transmittal of the report from ORP to Contractor.

5.0 Closure

The Team Leader, with concurrence of the Director, shall confirm that the open items from this oversight are adequately resolved.

Table 1: Initial Information Requirements

1.	Points of contact, lines of authority, and divisions of responsibility for design groups involved in the design activity under review.
2.	Procedures, guides, instructions, templates, etc. used in the design process.
3.	Applicable technical evaluations, reports, calculations, system descriptions, specifications, and drawings, including schematics, P&IDs, V&IDs, layouts, arrangements, etc.

Table 2: Schedule

Activity Description	Responsibility	Complete By
Develop Design Product Oversight Plan.	Lead	8/24/07
Identify Team members.	Lead	8/15/07
Advise Contractor of planned oversight and provide Design Product Oversight Plan to identify needed Contractor support.	Lead	8/27/07
Kick-off meeting with Contractor Discipline Engineering Managers to outline objectives, scope, schedule, and establish points of contact.	Team	9/10/07
Obtain documents from Contractor.	Team	9/10/07
Review Contractor documents, participate in relevant Contractor internal meetings and meet with Contractor as required.	Team	9/10/07
Prepare Draft Design Oversight Report.	Team	9/24/07
ORP and Contractor review of Report.	Team and Contractor	10/9/07
Resolve comments and issue Final Report including close out with Contractor.	Team	10/19/07

Task# ORP-WTP-2008-0002

E-STARS[R] Report
Task Detail Report
01/22/2008 0338

TASK INFORMATION			
Task#	ORP-WTP-2008-0002		
Subject	(Concur 07-WTP-327) DESIGN OVERSIGHT ASSESSMENT REPORT D-07-DESIGN-052 FINDING REPLY REQUESTED		
Parent Task#		**Status**	CLOSED 01/22/2008
Reference		**Due**	
Originator	Licht, Sarah (Licht, Sarah)	**Priority**	High
Originator Phone	(509) 376-6611	**Category**	None
Origination Date	01/03/2008 0846	**Generic1**	
Remote Task#		**Generic2**	
Deliverable	None	**Generic3**	
Class	None	**View Permissions**	Normal
Instructions	Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you. bcc: MGR RDG file WTP OFF file WTP RGD file M. K. Barrett, AMD T. M. Williams, AMD E. N. Diaz, WTP J. R. Eschenberg, WTP R. W. Griffith, WTP K. Thomas, WTP N. Welliver, WTP J. H. Wicks, WTP		

ROUTING LISTS		
1	Route List	Inactive
	• Diaz, Elaine N - Review - Concur with comments - 01/03/2008 0910 *Instructions:*	
	• Welliver, Nancy C - Review - Withdrawn - 01/10/2008 1427 *Instructions:*	
	• Griffith, Robert W - Review - Cancelled - 01/22/2008 1538 *Instructions:*	
	• Thomas, Kristopher D - Review - Concur - 01/10/2008 1555 *Instructions:*	
	• Wicks, James H - Review - Cancelled - 01/22/2008 1538 *Instructions:*	
	• Eschenberg, John R - Review - Concur - 01/15/2008 1248 *Instructions:*	

Task# ORP-WTP-2008-0002	
	• Olinger, Shirley J - Approve - Cancelled - 01/22/2008 1538 *Instructions:*
ATTACHMENTS	
Attachments	1. 07-WTP-327.END.Attach.D-07-DESIGN-052 Confinement Ventilation Systems Report.doc 2. 07-WTP-327.END.Elkins.doc
COLLABORATION	
COMMENTS	
Poster	Diaz, Elaine N (Diaz, Elaine N) - 01/03/2008 0901
	Concur
	Thank you Sarah!
TASK DUE DATE HISTORY	
No Due Date History	
SUB TASK HISTORY	
No Subtasks	

-- end of report --

Task# ORP-WTP-2008-0002

E-STARS[R] Report
Task Detail Report
01/22/2008 1118

TASK INFORMATION			
Task#	ORP-WTP-2008-0002		
Subject	(Concur 07-WTP-327) DESIGN OVERSIGHT ASSESSMENT REPORT D-07-DESIGN-052 FINDING REPLY REQUESTED		
Parent Task#		**Status**	Open
Reference		**Due**	
Originator	Licht, Sarah (Licht, Sarah)	**Priority**	High
Originator Phone	(509) 376-6611	**Category**	None
Origination Date	01/03/2008 0846	**Generic1**	
Remote Task#		**Generic2**	
Deliverable	None	**Generic3**	
Class	None	**View Permissions**	Normal
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ROUTING LISTS

1	Route List	Active
	• Diaz, Elaine N - Review - Concur with comments - 01/03/2008 0910 ED 1-22-08 *Instructions:*	
	• Welliver, Nancy C - Review - Withdrawn - 01/10/2008 1427 *Instructions:*	
	• Griffith, Robert W - Review - ~~Awaiting Response - Due Date~~ RWG 1/22/08 *Instructions:*	
	• Thomas, Kristopher D - Review - Concur - 01/10/2008 1555 KT 1/22/08 *Instructions:*	
	• Wicks, James H - Review - Awaiting Response - Due Date JW 1/22/2008 *Instructions:*	
	• Eschenberg, John R - Review - Concur - 01/15/2008 1248 JE 1/22 *Instructions:*	

Rec'd 1/22/08

Task# ORP-WTP-2008-0002

	• Olinger, Shirley J - Approve - Awaiting Response - Due Date *Instructions:*

ATTACHMENTS

Attachments	1. 07-WTP-327.END.Attach.D-07-DESIGN-052 Confinement Ventilation Systems Report.doc 2. 07-WTP-327.END.Elkins.doc

COLLABORATION

COMMENTS

Poster	Diaz, Elaine N (Diaz, Elaine N) - 01/03/2008 0901
	Concur
	Thank you Sarah!

TASK DUE DATE HISTORY

No Due Date History

SUB TASK HISTORY

No Subtasks

-- end of report --

Task# ORP-WTP-2008-0002

E-STARS[R] Report
Task Detail Report
01/03/2008 0849

TASK INFORMATION			
Task#	ORP-WTP-2008-0002		
Subject	(Concur 07-WTP-327) DESIGN OVERSIGHT ASSESSMENT REPORT D-07-DESIGN-052 FINDING REPLY REQUESTED		
Parent Task#		**Status**	Open
Reference		**Due**	
Originator	Licht, Sarah (Licht, Sarah)	**Priority**	High
Originator Phone	(509) 376-6611	**Category**	None
Origination Date	01/03/2008 0846	**Generic1**	
Remote Task#		**Generic2**	
Deliverable	None	**Generic3**	
Class	None	**View Permissions**	Normal
Instructions	Hard copy of the correspondence is being routed for concurrence. Once you have reviewed the correspondence, please approve or disapprove via E-STARS and route to the next person on the list. Thank you. bcc: MGR RDG file WTP OFF file WTP RGD file M. K. Barrett, AMD T. M. Williams, AMD E. N. Diaz, WTP J. R. Eschenberg, WTP R. W. Griffith, WTP K. Thomas, WTP N. Welliver, WTP J. H. Wicks, WTP		

ROUTING LISTS

1	Route List	Active
	• Diaz, Elaine N - Review - Awaiting Response - Due Date *Instructions:*	ED 1/10/08
	• ~~Welliver, Nancy C - Review - Awaiting Response - Due Date~~ ~~*Instructions:*~~ (review not required per discussion with Nancy.)	ED 1/10/08
	• Griffith, Robert W - Review - ~~Awaiting Response - Due Date~~ *Instructions:*	RWG 1/10/08
	• Thomas, Kristopher D - Review - Awaiting Response - Due Date *Instructions:*	KDT for Kris 1/14/08
	• Wicks, James H - Review - Awaiting Response - Due Date *Instructions:*	JW 14 Jan 08
	• Eschenberg, John R - Review - Awaiting Response - Due Date *Instructions:*	Rec'd 1/15/08
	• Olinger, Shirley J - Approve - Awaiting Response - Due Date *Instructions:*	

Task# ORP-WTP-2008-0002

ATTACHMENTS

Attachments	1. 07-WTP-327.END.Attach.D-07-DESIGN-052 Confinement Ventilation Systems Report.doc 2. 07-WTP-327.END.Elkins.doc

COLLABORATION

COMMENTS

No Comments

TASK DUE DATE HISTORY

No Due Date History

SUB TASK HISTORY

No Subtasks

-- end of report --