Department of Energy
Washington, DC 20585

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MEMORANDUM FOR JOHN R. ESCHENBERG
ASSISTANT MANAGER FOR
ENVIRONMENTAL MANAGEMENT
OAK RIDGE OFFICE

FROM: DR. STEVEN L. KRAHN
ACTING DEPUTY ASSISTANT SECRETARY FOR
SAFETY AND SECURITY PROGRAM
ENVIRONMENTAL MANAGEMENT

SUBJECT: Evaluation of Oak Ridge Office Environmental Management Facility Ventilation Systems in Response to Defense Nuclear Facilities Safety Board Recommendations 2004-2, Final Reports

Based on review of the information included in the subject reports, evaluation by the Defense Nuclear Facilities Safety Board (DNFSB) 2004-2 Independent Review Panel, the Environmental Management Technical Advisory Board, and input from the Chief of Nuclear Safety Office, the reports are approved with the following considerations.

- For the TRU Waste Processing Facility the review concludes that the ventilation systems were appropriately evaluated against the safety significant criteria associated with the established DNFSB 2004-2 evaluation guidelines and adequately met them.

- For the Portable Units, the review concludes that the ventilation systems were appropriately evaluated against the safety significant criteria associated with the established DNFSB 2004-2 evaluation guidelines with a single gap identified with respect to the lack of an interlock between the supply and exhaust fans. Closure of the identified gap is not recommended since interlocking of the two fans is (1) not a credited function in the DSA, (2) could result in a loss of ventilation flow to another building, and (3) could potentially result in contamination spread in the building with the loss of exhaust flow. The Environmental Management Technical Advisory Board (TAB) concluded that due to the temporary nature of these units, they should not have been included in these evaluations, and asked that they be deleted from further Recommendation 2004-2 consideration.

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- For the Molten Salt Reactor Experiment, the review concludes that the evaluations were done in accordance with evaluation guidelines and two performance gaps were identified. The field evaluation team concluded that closure of the gaps was not warranted because the facility has removed the reactor fuel and is transitioning to surveillance and maintenance. The TAB accepted these conclusions.

- For the Fission Product Development Laboratory the review concludes that the review was done in accordance with evaluation guidelines and three performance gaps were identified. The field evaluation team concluded that closure of the gaps was not warranted because the facility has no current mission and there are plans to D&D the facility. The TAB accepted these conclusions however, they asked for a description of the current material condition of the facility to assess whether a new mission might be a possibility and whether this facility has been identified for work under the American Recovery and Reinvestment Act (ARRA). If a change to the facility status is made, reconsideration of the identified gaps will be required.

- For the Liquid Low-Level Waste System the original review concluded that the ventilation systems were not appropriately evaluated against the safety significant criteria associated with the established DNFSB 2004-2 evaluation guidelines since this is a Category 2 facility. The TAB requested that this facility be verified as a Hazard Category 2 facility, which was subsequently accomplished. With that established, the TAB instructed that the field team should re-perform the evaluation against safety-significant criteria instead of defense-in-depth. The re-evaluation has been recently received and will be evaluated by the end of January 2010.

If you have any further questions, please call me at (202) 586-5151.

Attachments

INDEPENDENT REVIEW

OF

Oak Ridge
Portable Units
Ventilation System Evaluation Report

July 2009

Executive Summary

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Portable Units Ventilation System Evaluation report utilizing the process and criteria outlined in the Department of Energy's *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

ORO Portable Units are utilized to vent and purge legacy waste drums prior to receipt at the Transuranic (TRU) Waste Processing Facility. The location for performing this activity is in the portable unit which can be relocated to each storage facility to minimize TRU waste drum handling. The portable unit is of robust construction and features explosion proof electrical equipment, High Efficiency Particulate Air (HEPA) filtered ventilation, and dry chemical fire suppression. The portable unit has previously been used for missions such as disposition of shock sensitive materials and repackaging of radiological and mixed waste. There are no residual materials remaining in the portable units from these activities other than minor surface contamination. This activity is categorized as a Hazard Category 2 activity since the drums with the highest inventory of radiological material are greater than Hazard Category 2. The portable unit is not treated as a separate facility in the Documented Safety Analysis (DSA) because of its proximity to the facilities where the drums are currently stored.

The ORO Facility Evaluation Team (FET) reviewed the system function classification as part of the ventilation evaluation in accordance with the 2004-2 Ventilation System Evaluation Guide and concluded it was appropriately classified as Safety Significant.

The FET performing the review identified gaps between the ORO Portable Units ventilation system and the 2004-2 Ventilation System Evaluation Guide but concluded that resolution of the gaps was not mandatory in accordance with the criteria provided in the 2004-2 Ventilation System Evaluation Guide (i.e., gap resolution was discretionary). The FET evaluated the gaps and concluded that the gaps were acceptable because of unique aspects of the operations of the Portable Units and compensatory measures that are in place. No modifications were recommended.

The IRP concludes that the ventilation system evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

Results of Independent Review Panel's Review of the Oak Ridge Office Portable Units Ventilation System Evaluation Report

1. INTRODUCTION

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Portable Units Ventilation System Evaluation Report utilizing the process and criteria outlined in the Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

As stated in Revision 1 of the DNFSB Recommendation 2004-2 Implementation Plan, the focus of the ventilation system evaluation is to:

- Verify that appropriate performance criteria are derived for ventilation systems
- Verify that these systems can meet the performance criteria, if applicable, and
- Determine if any physical modifications are necessary to enhance safety performance.

The IRP team reviewed the ORO Portable Units Ventilation System Evaluation report to determine whether it was performed in accordance with the 2004-2 Ventilation System Evaluation Guide; evaluate the appropriateness of the evaluation results and methods proposed for eliminating identified gaps, if any, (between the existing ventilation system and applicable performance criteria); and provide any additional input considered appropriate to the responsible program and site offices.

2. FACILITY AND VENTILATION SYSTEM OVERVIEW

Newly-generated drums of Transuranic (TRU) waste are required to have vents to relieve the potential buildup and pressurization from gas generation and a sampling port for headspace gas sampling. The Melton Valley Solid Waste Storage Facility TRU facilities contain a large number of legacy waste drums that are not vented. These drums must be vented and the headspace gas sampled for explosive gases and total volatile Organic Compounds (VOCs) before receipt at the TRU Waste Processing Facility. They are brought into compliance with these requirements through the vent and purge process, which is performed inside a portable unit using a remotely actuated pneumatic driver unit configured to install the filter vents/sample ports. The location for performing this activity is in the portable unit which can be relocated to each storage facility to minimize TRU waste drum handling.

The portable units consist of structures similar in construction to a Sealand container mounted atop a heavy duty trailer. The portable units are not designed to withstand significant natural phenomena hazard events. The portable units are not likely to be used during inclement weather for personnel safety considerations. Seismic events are

unpredictable, but would at worst tip the portable unit over. An exhaust fan and High Efficiency Particulate Air (HEPA) filter are mounted on the portable unit and draw air from the compartment. This provides some confinement of radiological hazards that could be released in the enclosure.

The only scenarios in the Documented Safety Analysis (DSA) that are exclusively associated with this system are those tied to operational upsets during the vent and purge process. These events are primarily deflagration and fire, and are limited to single container events.

3.0 REVIEW RESULTS

3.1 Derivation of Ventilation System Performance Criteria and Confinement Strategy

The ORO Portable Units ventilation evaluation appropriately followed the process outlined in the 2004-2 Ventilation System Evaluation Guide in developing the Data Collection Table used to identify accidents, their unmitigated consequences, and the confinement strategy based upon the DSA. Furthermore, the Data Collection Table included the performance expectation for the ventilation systems.

The determination of bounding unmitigated consequences presented in the DSA was reviewed by the FET. It was determined that the quantitative dose consequences are determined in accordance with DOE-STD-3009-94 and do not challenge the evaluation guideline (it is noted that the analyses of fire and deflagration included in the DSA have been determined to be conservative relative to the recently issued standard [DOE-STD-5506-2007] for evaluating TRU waste). The HEPA filter system is identified in the DSA as a Defense in Depth control that is elevated to a Safety Significant classification but is not credited for significantly reducing event consequences. The control suites identified in the DSA focus on preventative measures and inventory limits as well as the portable unit structure and drum lid restraints to minimize releases to reduce risk associated with identified events to acceptable levels.

The FET concluded that the ventilation system for the ORO Portable Units is appropriately and conservatively classified as Safety Significant. The IRP concludes that this functional evaluation was appropriately performed in accordance with the 2004-2 Ventilation System Evaluation Guide.

3.2 Evaluation of Ventilation System Against the Selected Performance Criteria

The ORO Portable Units ventilation report evaluated the ventilation system utilizing the Safety Significant criteria from the 2004-2 Ventilation Evaluation Guide. The ORO Portable Units Ventilation System Evaluation Report provides a systematic evaluation of the ventilation systems against the 2004-2 performance criteria to identify any gaps.

Three gaps were identified, lack of filters on air inlets, no local alarm on system to indicate operability issues, and no real-time monitoring for filter breakthrough.

In addition, the FET identified that there was a potential for the HEPA filters to plug upon discharge of the Dry Chemical fire extinguishing agent. However, since the extinguishing agent's agent function is to eliminate the potential that a fire, if initiated, could propagate and challenge the HEPA confinement system, this was not identified as a gap. After discharge of the Dry Chemical agent, HEPA filters would be replaced prior to any future operation of the system.

The IRP concluded that evaluation of the ventilation systems against the 2004-2 Ventilation System Evaluation performance criteria was appropriately performed.

3.3 Evaluation of physical modifications to enhance safety performance

2004-2 Ventilation System Evaluation Guide specifies that an evaluation of physical modifications that may be appropriate to enhance the ventilation system in the areas where the current confinement ventilation system does not meet the 2004-2 evaluation criteria should be performed. In this respect, the ORO FET reviewed each of the gaps as follows.

The first gap, lack of filters on air inlet gaps was determined to be acceptable. Inlet air enters the portable unit through inlet louvers near the floor and through unsealed joints. Material in-leakage is not considered to be a concern. The DSA does not credit the portable unit and ventilation system for providing significant confinement. The physical volume of the portable unit will minimize pressurization of the unit in the event of a deflagration. Material released in the event of a fire in the unit will preferentially be exhausted through the ventilation system.

The second gap, no local alarm on system to indicate operability issues was determined to be acceptable. The portable unit HEPA filtered ventilation system is not equipped with alarms that would indicate filter DP problems, fan failure, etc. The lack of a local alarm indicating operability issues is addressed by the fact that the unit is operated locally and facility workers are in attendance outside the portable unit and next to the HEPA filter system the entire time the unit is operating. Operational issues would be identified during operation. These aspects of portable unit operation are considered compensatory measures.

The third identified gap, no real-time monitoring for filter breakthrough was determined to be acceptable. Normal operations in the portable unit do not result in release of significant levels of contamination. However, in accordance with the Radiological Protection Safety Management Program, a filter paper air monitor is positioned on the stack exhaust and is routinely monitored during operation. This would indicate breakthrough that may not be apparent by a drop in DP on the gages. Normal operating procedures require video surveillance of remote drum operations which would alert operators to an accident inside the unit (deflagration, fire) and initiate response actions. Also, because the system is not run continuously, the filter DP gages are read after startup and before remote operations in the unit commence.

The ORO Facility Evaluation Team thus recommended, due to the low risk associated with the identified gaps, the gaps do not need to be closed at this time.

The IRP concluded that ORO evaluation of the physical modifications was appropriately performed in accordance with the 2004-2 Ventilation System Evaluation Guide.

4. CONCLUSIONS

IRP concludes that the ORO Portable Units Evaluation Report was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation system Evaluation Guide.

5. RECOMMENDATIONS

The IRP recommends that the Program Secretarial Office and Central Technical Authority accept the ORO Portable Units Ventilation System Evaluation Report.

6. REVIEW TEAM MEMBERS

James O'Brien, IRP Chairman
Robert Nelson, IRP Member EM

Note: The IRP has established a review process that includes an initial review by two members of the IRP to determine whether the evaluation: (1) is consistent with the implementation plan methodology and expectations (including choice of evaluation criteria) and (2) was performed and documented with an appropriate the level of detail and rigor.

A detailed-full IRP team review will be performed if the ventilation evaluation report is not consistent with the implementation plan, was not performed with an appropriate level of detail or rigor (after consultation with the report developers), or has unique ventilation strategies, gap analysis, or corrective actions that warrant full IRP review.

For this evaluation, a detailed-full IRP team review was not determined to be necessary.

INDEPENDENT REVIEW

OF

Oak Ridge
Liquid Low-Level Waste System
Ventilation System Evaluation Report

July 2009

Executive Summary

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Liquid Low-Level Waste (LLLW) System Ventilation System Evaluation Report utilizing the process and criteria outlined in Department of Energy's *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

The LLLW System at Oak Ridge National Laboratory (ORNL) consists of tanks, process equipment, and interconnecting pipelines used for collection, volume reduction, transfer, and storage of LLLW generated at various facilities. The LLLW System facilities are located at various sites in Bethel Valley and Melton Valley at ORNL. LLLW generated by ORNL facilities is collected at the source facilities, transferred to the LLLW evaporator facility for treatment and volume reduction, and pumped from Bethel Valley through underground pipeline to Melton Valley for storage in existing tanks. LLLW generated in the Melton Valley area may be similarly pumped through the same pipeline to the LLLW evaporator facility for volume reduction and subsequent return for storage.

The LLLW system includes three waste tank systems at Buildings 2537, 7830, and 7856 which are categorized as Hazard Category 2 facilities and are the focus of this evaluation. The ventilation systems at these facilities are classified as defense in depth.

The Facility Evaluation Team (FET) performing the ventilation system evaluation reviewed the functional classification of the systems and concluded that they were correctly classified as defense in depth. They evaluated against the 2004-2 Ventilation System Evaluation Guide performance criteria at the defense in depth level in lieu of the Safety Significant level as specified in the 2004-2 Ventilation System Evaluation Guide for Hazard Category 2 facilities) and determined that it met all the criteria.

The IRP concludes that although the ventilation systems evaluation was performed correctly in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide for a defense in depth system, the IRP was unable to evaluate whether the system would meet the criteria established for the Safety Significant level.

Results of Independent Review Panel's Review of the Oak Ridge Office Liquid Low-Level Waste System Ventilation System Evaluation Report

1. INTRODUCTION

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Liquid Low-Level Waste (LLLW) Ventilation System Evaluation Report utilizing the process and criteria outlined in Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

As stated in Revision 1 of the DNFSB Recommendation 2004-2 Implementation Plan, the focus of the ventilation system evaluation is to:

- Verify that appropriate performance criteria are derived for ventilation systems
- Verify that these systems can meet the performance criteria, if applicable, and
- Determine if any physical modifications are necessary to enhance safety performance.

The IRP team reviewed the ORO LLLW Ventilation System Evaluation Report to determine whether it was performed in accordance with the 2004-2 Ventilation System Evaluation Guide; evaluate the appropriateness of the evaluation results and methods proposed for eliminating identified gaps, if any, between the existing ventilation system and applicable performance criteria; and provide any additional input considered appropriate to the responsible program and site offices.

2. FACILITY AND VENTILATION SYSTEM OVERVIEW

The Evaporator Service Tank Facility, Building 2537 contains three 50,000-gal underground collection and storage tanks used to collect and store both dilute and concentrated Liquid Low Level Waste (LLLW). As dilute LLLW is collected from the Bethel Valley and Melton Valley collection systems, it is stored in one of the service tanks. The tanks and vaults are designed for containment of radioactive liquids and provide double containment. Primary confinement of the LLLW in the Evaporator Service Tank facility is provided by the service tanks and their associated piping and equipment. Secondary confinement for the LLLW is provided by stainless-steel-lined concrete vault structures.

Approximately 700 cubic feet per minute (cfm) of air is supplied to the vault containing tanks W-21 and W-22 through a roughing filter, a pre-filter, and a back-flow preventer. The vault containing tank W-23 receives approximately 350 cfm of supply air from a separate inlet through a roughing filter, a pre-filter, and a back-flow preventer. Both of these air streams are discharged through the cell ventilation system filters at Building

2568, to the central ORNL Gaseous Waste Disposal System. The tank ventilation system has separate air intakes for each tank which draw fresh air through a back-flow preventer, roughing filter, pre-filter, and high efficiency particulate air (HEPA) filter. Each tank exhausts through an individual demister and a common roughing and HEPA filter before discharging through the off-gas system filters at Building 2568 to the central ORNL Gaseous Waste Disposal System.

The Melton Valley Storage Tank (MVST) Facility, Building 7830 contains eight 50,000-gal storage tanks (installed in two underground vaults) which provide storage capacity for concentrated LLLW from the evaporator. The storage tanks are equipped with liquid-level indicators, temperature measuring devices, and sampling devices. Instrument readouts are available at the local control house located above grade immediately south of the pipe tunnel and storage tanks.

Primary confinement for the LLLW is provided by the storage tanks and the interconnecting pipes, valves, and pumps. Secondary confinement is provided by stainless-steel-lined concrete vaults surrounding the tanks and piping. Cell and tank off-gas from the MVST Facility cannot be discharged through the central ORNL Gaseous Waste Disposal System because of the facility's remote location. Therefore, following filtration, exhaust is discharged to the atmosphere locally. Separate ventilation systems are provided for the storage tanks, the vaults, the pipe tunnel, and the control house.

Each vault receives approximately 1000 cfm of fresh air through a roughing filter and a pre-filter. This combines with 375 cfm of air from the pipe tunnel, is swept through the cell and discharges to the atmosphere through a fire barrier, a roughing filter, HEPA filter, and the vault exhaust stack. The pipe tunnel receives 800 cfm of fresh air through a roughing filter and a pre-filter. Of this, 700 cfm joins the cell ventilation through the vaults and the remaining 100 cfm passes through the sampling area and is discharged with the tank off-gas.

The Melton Valley Storage Tanks Annex, Building 7856 provides long term storage capacity for the liquid low-level radioactive waste system at the ORNL. Building 7856 houses six tank vaults, each containing a 100,000-gal horizontal, cylindrical tank. The tanks and tanks vaults are provided with a once-through, HEPA-filtered ventilation system. The LLLW transferred and stored in Building 7856 is within at least two layers of confinement at all times during normal operations. The primary confinement is made up of the six 100,000-gal storage tanks, their ventilation systems, the interconnecting and transfer piping, pumps, and valves. Secondary confinement is provided by the stainless steel liners in the tank vaults, pump and valve vault, and the valve box; by secondary confinement piping in the underground transfer pipeline; and by the vault HVAC systems.

Two HVAC systems provide confinement functions for Building 7856: the vault ventilation system and the tank ventilation system. The vault ventilation system provides once-through ventilation for each of the six tank vaults and for the pump and valve vault. Outside air is drawn through inlet filters, a backflow preventer, a roughing, filter, and a pre-filter. Exhaust air is directed through two exhaust filter units where is passes through a pre-filter and a HEPA filter. The tank ventilation system provides once-through

ventilation for the six 100,000 gal storage tanks. Outside air is filtered through one of two inlet filter units passing through a roughing filter, a pre-filter and a HEPA filter. The exhaust ducts from each tank join in a header in the pump and valve vault where the air is directed through a pre-filter and two HEPA filters.

3.0 REVIEW RESULTS

3.1 Derivation of Ventilation System Performance Criteria and Confinement Strategy

The Facility Evaluation Team performing the system evaluation, reviewed determination of bounding unmitigated consequences presented in the DSA and concluded that the quantitative dose consequences were determined in accordance with DOE-STD-3009-94 and do not challenge the DOE-STD-3009-94 evaluation guideline. The ventilation systems are not individually credited for reducing event consequences to a lower risk bin. The control suites identified in the DSA focus on preventive measures and inventory limits as well as the secondary containment systems such as the vaults in lieu of the ventilation systems. The FET concluded that the ventilation systems associated with LLLW System are appropriately and conservatively classified as defense in depth.

The IRP concluded that the ORO FET appropriately reviewed the safety classification of the ventilation system as specified in the 2004-2 Ventilation System Evaluation Guide.

3.2 Evaluation of Ventilation System Against the Selected Performance Criteria

The ORO LLLW System Ventilation Report utilizing the defense-in-depth criteria from the 2004-2 Ventilation Evaluation Guide in lieu of the Safety Significant level as specified in the 2004-2 Ventilation System Evaluation Guide for Hazard Category 2 facilities. The ORO LLLW System Evaluation Report provides a systematic evaluation of the ventilation systems against the 2004-2 performance criteria to identify any gaps. No gaps were identified against the defense in depth criteria.

The IRP concludes that although the ventilation systems evaluation was performed correctly in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide for a defense in depth system, the IRP was unable to evaluate whether the system would meet the criteria established for the Safety Significant level.

4. CONCLUSIONS

IRP concludes that the ORO Liquid Low-Level Waste System ventilation systems evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

5. RECOMMENDATIONS

The IRP recommends that the Program Secretarial Office and Central Technical Authority accept the ORO Liquid Low-Level Waste System Ventilation System Evaluation Report.

6. REVIEW TEAM MEMBERS

James O'Brien, IRP Chairman
Robert Nelson, IRP Member EM

Note: The IRP has established a review process that includes an initial review by two members of the IRP to determine whether the evaluation: (1) is consistent with the implementation plan methodology and expectations (including choice of evaluation criteria) and (2) was performed and documented with an appropriate the level of detail and rigor.

A detailed-full IRP team review will be performed if the ventilation evaluation report is not consistent with the implementation plan, was not performed with an appropriate level of detail or rigor (after consultation with the report developers), or has unique ventilation strategies, gap analysis, or corrective actions that warrant full IRP review.

For this evaluation, a detailed-full IRP team review was not determined to be necessary.

INDEPENDENT REVIEW

OF

Oak Ridge Office Fission Product Development Laboratory Ventilation System Evaluation Report

July 2009

Executive Summary

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Fission Product Development Laboratory Ventilation System Evaluation report utilizing the process and criteria outlined in Department of Energy's *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

The ORO Fission Product Development Laboratory is a partially deactivated Hazard Category 2 nuclear facility that no longer has a programmatic mission and has been transitioned to the Environmental Management Program to be deactivated and decommissioned. The facility is undergoing transitional surveillance and maintenance and limited deactivation activities until assets are available for final decommissioning. Although all process-related activities have been discontinued in Building 3517, the facility still contains radioactive and hazardous materials. Surveillance and maintenance includes activities such as performing facility walk-downs to detect changing conditions, monitoring the ventilation systems to verify that they are operating within specified parameters.

The Laboratory's Cell Ventilation System provides negative pressure to the hot cells and the resulting air in-leakage into the hot cells keeps the rest of the building (except the airlocks) under negative pressure relative to the outside pressure. The Cell Ventilation System exhausts through high efficiency air filters. The Cell Ventilation System if functionally classified as safety significant.

The ORO Facility Evaluation Team (FET) concluded that the ventilation system associated with Building 3517 is appropriately and conservatively classified as safety significant. The FET reviewed Cell Ventilation System utilizing the safety significant performance criteria in the 2004-2 Ventilation System Evaluation Guide and identified three performance gaps, i.e., materials of construction, no real-time monitoring for final filter breakthrough, and the ventilation system is not designed or credited to withstand an event where the building, hot cells or ductwork integrity is lost. The ORO FET recommended no modifications at this time primarily due to there being no current mission for the Fission Product Development Laboratory and future plans to deactivate and decommission it.

The IRP concludes that the ventilation systems evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

Results of Independent Review Panel's Review of the Oak Ridge Office Fission Product Development Laboratory Ventilation System Evaluation Report

1. INTRODUCTION

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Fission Product Development Laboratory Ventilation System Evaluation Report utilizing the process and criteria outlined in Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

As stated in Revision 1 of the DNFSB Recommendation 2004-2 Implementation Plan, the focus of the ventilation system evaluation is to:

- Verify that appropriate performance criteria are derived for ventilation systems
- Verify that these systems can meet the performance criteria, if applicable, and
- Determine if any physical modifications are necessary to enhance safety performance.

The IRP team reviewed the ORO Fission Product Development Laboratory Ventilation System Evaluation report to determine whether it was performed in accordance with the 2004-2 Ventilation System Evaluation Guide; evaluate the appropriateness of the evaluation results and methods proposed for eliminating identified gaps, if any, between the existing ventilation system and applicable performance criteria; and provide any additional input considered appropriate to the responsible program and site offices.

2. FACILITY AND VENTILATION SYSTEM OVERVIEW

The ORO Fission Product Development Laboratory is a partially deactivated Hazard Category 2 nuclear facility that no longer has a programmatic mission and has been transitioned to the Environmental Management Program to be deactivated and decommissioned. The facility is undergoing transitional surveillance and maintenance and limited deactivation activities until assets are available for final decommissioning. Although all process-related activities have been discontinued in Building 3517, the facility still contains radioactive and hazardous materials.

Building 3517 is served by two ventilation systems: the Cell Ventilation System (CVS) and the Process Off-Gas System (POG). The CVS provides negative pressure to the hot cells. In-leakage into the hot cells keeps the rest of the building (except the airlocks) under negative pressure relative to the outside pressure. An air inlet damper located on the west side of the second level acts as a vacuum relief device, preventing pressure within the building from becoming too negative. The building is sealed and equipped

with airlock entries for personnel and vehicles. The air-lock doors are gasketed. Cell ventilation exhaust air passes through 30 inch diameter concrete ducts to the filters in the underground filter pit, Building 3547, and Building 3548 filter houses. The exhaust then passes through 30 inch metal ducting to the Building 3623 filter house prior to being discharged through the ORNL 3039 stack. The filters in Building 3623 are HEPA filters. The filters in Buildings 3547 and 3548, while HEPA filters, are considered roughing filters. Exhaust fans are part of the ORNL 3039 stack ventilation system. The 3517 CVS boundary ends with the outlet dampers from the 3623 filter house.

The POG system keeps the LLLW tanks under negative pressure with respect to their cells, inhibiting migration of contamination from the tanks into the cells. Exhaust from the process off-gas system goes to the scrubber in Building 3092 and then exhausts through the ORNL 3039 stack. The 3517 process off-gas system ends where the ducts exit the building.

3.0 REVIEW RESULTS

3.1 Derivation of Ventilation System Performance Criteria and Confinement Strategy

The ventilation systems are currently classified as a safety significant system in the Documented Safety Analysis (DSA). The Facility Evaluation Team (FET) performing the ventilation evaluation reviewed the determination of bounding unmitigated dose consequences presented in the DSA and concluded that the dose consequences were determined in accordance with DOE-STD-3009-94 and do not challenge the evaluation criteria. The FET concluded that the CVS, HEPA filtered ventilation system associated with Building 3517 is appropriately and conservatively classified as safety significant.

The IRP concluded that the FET appropriately reviewed the safety classification of the ventilation system as specified in the 2004-2 Ventilation System Evaluation Guide.

3.2 Evaluation of Ventilation System Against the Selected Performance Criteria

The ORO Fission Product Development Laboratory Evaluation Report included a brief description of how the ventilation systems met the safety significant performance criteria in the 2004-2 Ventilation System Evaluation Guide and identified reference documents used as part of the review. The ORO System Evaluation Report identified three gaps with respect to the DNFSB 2004-2 Evaluation Guidance. The first gap is that some of the ductwork that runs underground is made of Reinforced Concrete Pipe. Though this material does not specifically meet the recommendation from DOE Handbook for ductwork (all-welded stainless or carbon steel construction). The second gap identified was that there is no real-time monitoring for final filter breakthrough. The final gap identified is that the CVS is not designed or credited to withstand an event where the building, hot cells or ductwork integrity is lost.

The IRP concluded that evaluation of the ventilation systems against the 2004-2 Ventilation System Evaluation performance criteria was appropriately performed.

3.3 Evaluation of physical modifications to enhance safety performance

For the first gap, the ORO FET stated that although the underground ductwork was constructed of reinforced concrete and not all-welded stainless or carbon steel, the duct has a fairly good resistance to corrosion. The air ducted through these pipes is non-corrosive ambient air carrying particulate matter which reduces the need for the corrosion protection properties of stainless steel. As such, the ORO determined that the identified gap is acceptable based on the similar nature of the material and the fact that non-corrosive air passes through the ducting.

For the second gap, the ORO FET evaluation states that the final filter located in Building 3623 has DP gauges monitoring the status of the filter. The gauges are checked visually on a set weekly schedule in accordance with the Technical Safety Requirement as established by engineering judgment and the fact that no activities are routinely conducted in the cells. A filter break through would result in an increase in airflow being evacuated. This would increase the cell and building DPs, but may not set off the audible alarms associated with the 3517 building and cell differential pressures. The filter break through would be seen as a much reduced filter DP on the monitoring gauges and would induce corrective action at the next cyclic inspection. Modifications to the Building 3623 filter to provide real time monitoring have not been made and non are planned, primarily due to the age and current mission of the facility. The final filter in Building 3623 is preceded by two sets of non-credited roughing filters located in the underground filter pit and above ground structure. These filters are HEPA quality filters and as defense-in-depth components serve to reduce/prevent contamination release through stack 3039 in case of a 3623 filter break through, but are not credited in the DSA as providing any mitigation to releases. As such, the ORO FET determined the identified gap to be acceptable.

The final gap concerns the ventilation system to withstand an event where the building, hot cells or ductwork integrity is lost. Modifications were made to the building in 1992 based on the findings of a 1989 Seismic Evaluation to implement recommendations. The building is now expected to be able to withstand a severe earthquake. The cells are massive with 4 foot thick concrete walls therefore the likelihood of a cell being breached is very low. However, the ductwork above and below ground can be affected by natural phenomenon and be breached. Modifications have not been made to the existing ductwork and none are planned, primarily due to the age and the current S&M mission of the facility. As the mission of the facility changes to deactivation and decommissioning, modifications to the building and system would be re-evaluated. The DSA recognizes that the building, cells, and ductwork may not survive natural phenomena events and does not credit the CVS with mitigating the release. As such, the ORO FET determined the identified gap to be acceptable.

The IRP concluded that the ORO FET evaluation was appropriately performed in accordance with the 2004-2 Ventilation System Evaluation Guide with consideration of the current S&M status of the building.

4. CONCLUSIONS

IRP concludes that the ORO Fission Product Development Laboratory Ventilation System Evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

5. RECOMMENDATIONS

The IRP recommends that the Program Secretarial Office and Central Technical Authority accept the ORO Fission Product Development Laboratory Ventilation System Evaluation Report.

6. REVIEW TEAM MEMBERS

James O'Brien, IRP Chairman, Office of Health, Safety and Security
Robert Nelson, IRP Member, Office of Environmental Management

Note: The IRP has established a review process that includes an initial review by two members of the IRP to determine whether the evaluation: (1) is consistent with the implementation plan methodology and expectations (including choice of evaluation criteria) and (2) was performed and documented with an appropriate the level of detail and rigor.

A detailed-full IRP team review will be performed if the ventilation evaluation report is not consistent with the implementation plan, was not performed with an appropriate level of detail or rigor (after consultation with the report developers), or has unique ventilation strategies, gap analysis, or corrective actions that warrant full IRP review.

For this evaluation, a detailed-full IRP team review was not determined to be necessary.

INDEPENDENT REVIEW

OF

Oak Ridge Office
Molten Salt Reactor Experiment Facility
Ventilation System Evaluation Report

August 2009

Executive Summary

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Molten Salt Reactor Experiment Facility Ventilation System Evaluation report utilizing the process and criteria outlined in Department of Energy's *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

The ORO Molten Salt Reactor Experiment Facility is currently a Hazard Category 2 nuclear facility that was originally operated as a concept test for the use of molten salt containing uranium as the fuel for the reactor. The reactor operated in the late 1960s and was shut down in 1969. At that time, the fuel salt was removed from the reactor and stored in two duel drain tanks in the facility. The Containment Ventilation System was designed to vent the secondary containment structure, principally the reactor cell, drain tank cell and other service cells, during the reactor experiment. The systems continued to operate in this capacity until the current fuel salt disposition project was initiated to remove the uranium from the salts. The ventilation system was augmented to provide secondary confinement for process equipment. The process equipment includes the equipment to sparge the salt, remove the fuel as uranium hexafluoride (UF_6), and trap the UF_6. Since this report was accomplished, molten salt has been removed from the facility and the facility has transitioned to surveillance and maintenance as a Hazard Category 2 nuclear facility awaiting decommissioning.

The ORO Facility Evaluation Team (FET) concluded that the ventilation system associated with the Molten Salt Reactor Experiment Facility is appropriately and conservatively classified as safety significant. ORO evaluated the ventilation system performance against the 2004-4 Ventilation System Evaluation Guide and identified two performance gaps, i.e., the ventilation system does not maintain its integrity for Design Basis Accident fire and natural phenomena hazards, and the ventilation system controls are not fail-safe. The criteria identified as gaps were not considered by the ORO FET to be necessary for the ventilation system to perform the credited mitigative function. This conclusion is consistent with the requirements in the Molten Salt Reactor Experiment Safety Basis.

The IRP concludes that the ventilation systems evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

Results of Independent Review Panel's Review of the Oak Ridge Office Molten Salt Reactor Experiment Facility Ventilation System Evaluation Report

1. INTRODUCTION

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Office (ORO) Molten Salt Reactor Experiment Facility Ventilation System Evaluation Report utilizing the process and criteria outlined in Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

As stated in Revision 1 of the DNFSB Recommendation 2004-2 Implementation Plan, the focus of the ventilation system evaluation is to:

- Verify that appropriate performance criteria are derived for ventilation systems
- Verify that these systems can meet the performance criteria, if applicable, and
- Determine if any physical modifications are necessary to enhance safety performance.

The IRP team reviewed the ORO Molten Salt Reactor Experiment Facility Ventilation System Evaluation report to determine whether it was performed in accordance with the 2004-2 Ventilation System Evaluation Guide; evaluate the appropriateness of the evaluation results and methods proposed for eliminating identified gaps, if any, between the existing ventilation system and applicable performance criteria; and provide any additional input considered appropriate to the responsible program and site offices.

2. FACILITY AND VENTILATION SYSTEM OVERVIEW

The ORO Molten Salt Reactor Experiment Facility was originally operated as a concept test for the use of molten salt containing uranium as the fuel for the reactor. The reactor operated in the late 1960s and was shut down in 1969. At that time, the fuel salt was removed from the reactor and stored in two duel drain tanks in the facility. Flush salt was run through the reactor to remove residual uranium and stored in the fuel flush drain tank. These drain tanks are located in a below grade cell next to the reactor cell. The fuel and flush salt was allowed to cool and solidify. The Containment Ventilation System was designed to vent the secondary containment structure, principally the reactor cell, drain tank cell and other service cells, during the reactor experiment. The systems continued to operate in this capacity until the current fuel salt disposition project was initiated to remove the uranium from the salts. The ventilation system was augmented to provide secondary confinement for process equipment. The process equipment includes the

equipment to sparge the salt, remove the fuel as uranium hexafluoride (UF_6), and trap the UF_6.

The Molten Salt Reactor Experiment ventilation system is credited to protect facility workers from potential releases of hazardous gases. Since release of significant quantities of process gases is possible only during certain fuel disposition processes, the ventilation system is only credited for these specific operations. The minimum differential pressure associated with each ventilation system enclosure is designated to correspond to a ventilation flow rate sufficient to remove any anticipated release within the enclosure. The ventilation system enclosure pressures are monitored daily when an applicable process is in the Operation Mode. The checks ensure the credited minimum flow exists in the enclosures. When UF_6 is released in the air, it immediately hydrolyzes into a solid aerosol. The main High Efficiency Particulate Air (HEPA) filters are credited with reducing the quantity of uranium that may be released through the stack should there be a release in the facility.

3.0 REVIEW RESULTS

3.1 Derivation of Ventilation System Performance Criteria and Confinement Strategy

The system is currently classified as a safety significant system in the Documented Safety Analysis (DSA). Once the uranium and hazardous gases are removed from the facility (accomplished post submittal of this evaluation report) the ventilation system will no longer be considered a safety significant system. Since the Molten Salt Reactor Experiment Facility remains a Hazard Category 2 nuclear facility requiring, at a minimum, an evaluation against safety-significant criteria the evaluation would be unchanged. The ORO Facility Evaluation Team (FET) evaluated the system per Deliverable 8.5.4 and 8.7 of the Implementation Plan for DNFSB 2004-2, *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related Systems.*

The determination of bounding unmitigated consequences presented in the DSA was reviewed by the FET. The FET found that the quantitative dose consequences are determined in accordance with DOE-STD-3009-94 and do not challenge the evaluation guideline for the public and co-located workers. The ventilation system is identified in the Molten Salt Reactor Experiment Facility Safety Basis Documents as a safety significant system which is credited with reducing the consequences to facility workers during hazardous gas releases. Specific performance criteria include maintaining differential pressures within the credited enclosures and across HEPA filters in the main filter pit. Quantitative filtering efficiency criteria are also identified in the Technical Safety Requirements.(TSR) .

The FET concluded that the Molten Salt Reactor Experiment Facility ventilation system is appropriately and conservatively classified as safety significant for specified processes and mitigative measures.

The IRP concluded that the FET appropriately reviewed the safety classification of the ventilation system as specified in the 2004-2 Evaluation Guide.

3.2 Evaluation of Ventilation System Against the Selected Performance Criteria

The ORO Molten Salt Reactor Experimental Facility Evaluation Report included a brief description of how the ventilation systems met the criteria and specified reference documents used as part of the review.

The ORO FET System Evaluation Report identified two gaps with respect to the DNFSB 2004-2 Ventilation System Evaluation Guidance. The first gap is that the ventilation system does not maintain its integrity for Design Basis Accident (DBA) fire and natural phenomena hazards (NPH). The second gap identified was that the ventilation system controls are not fail safe.

The IRP concluded that evaluation of the ventilation systems against the 2004-2 Ventilation System Evaluation performance criteria was appropriately performed.

3.3 Evaluation of physical modifications to enhance safety performance

For the first gap, the ORO FET stated that the integrity of the ventilation system can not be certified for design basis NPH such as earthquakes and tornados. In addition the ventilation system would not survive an unmitigated DBA major facility fire. The ventilation system is not credited by the Safety Basis to perform any mitigative function for these types of events. The safety of facility workers is based on prompt evacuation of the process area during these NPH and fire events. Given the requirements from the Molten Salt Reactor Experiment Safety Basis, the identified gap is determined to be acceptable. Additionally, the fuel salt has been effectively removed from the facility post this evaluation.

For the second gap, the ORO FET evaluation states that the ventilation system is a manually operated system in that the fans and baffles are manually operated and have no automatic response to events. The system strategy is based on the mitigative function of the system for potential accidents. The system is designed to remain operating if there is a release of hazardous gas in the facility. There is no event in the Molten Salt Reactor Experiment Facility Safety Basis that takes credit for the ventilation system when a concurrent ventilation system failure and release is involved (e.g., during an earthquake). The Molten Salt Reactor Experiment Safety Basis specifically addresses ventilation system failures during operations. The TSR requires that access to the affected area is controlled immediately, and the system is restored within 8 hours. If restoring the system cannot be achieved in the prescribed time, then all reagent gas feed valves must be closed, uranium transfers suspended, and the affected process placed in a mode where the ventilation system is not required. These requirements meet the intent of a fail-safe system. Given the requirements from the Molten Salt Reactor Experiment Safety Basis, the identified gap is determined to be acceptable. Additionally, the fuel salt has been effectively removed from the facility post this evaluation and the facility has transitioned to surveillance and maintenance as a Hazard Category 2 nuclear facility awaiting decommissioning..

The IRP concluded that the ORO FET evaluation was appropriately performed in accordance with the 2004-2 Ventilation System Evaluation Guide with consideration of the requirements of the Safety Basis.

4. CONCLUSIONS

IRP concludes that the ORO Molten Salt Reactor Experiment Facility Ventilation System Evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

5. REVIEW TEAM MEMBERS

James O'Brien, IRP Chairman
Robert Nelson, IRP Member EM

Note: The IRP has established a review process that includes an initial review by two members of the IRP to determine whether the evaluation: (1) is consistent with the implementation plan methodology and expectations (including choice of evaluation criteria) and (2) was performed and documented with an appropriate the level of detail and rigor.

A detailed-full IRP team review will be performed if the ventilation evaluation report is not consistent with the implementation plan, was not performed with an appropriate level of detail or rigor (after consultation with the report developers), or has unique ventilation strategies, gap analysis, or corrective actions that warrant full IRP review.

For this evaluation, a detailed-full IRP team review was not determined to be necessary.

Independent Review

of

Oak Ridge Operations (ORO) TRU Waste Processing Center (TWPC) Ventilation System Evaluation Report

July 2009

Executive Summary

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Operations (ORO) TRU Waste Processing Center (TWPC) DNFSB Recommendation 2004-2 Process Building (PB) Ventilation System Evaluation Report utilizing the process and criteria outlined in the Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

The TWPC, located in the Melton Valley area of the ORO, is responsible for retrieval, treatment and packaging of Transuranic (TRU)/Alpha low level radioactive waste for offsite disposal. The TWPC PB is a Hazard Category 2 facility. The maximum dose from the design basis accident (fire in a glovebox) is well below the Evaluation Guidelines (EGs) to the public.

The current confinement strategy for the TWPC facility is to utilize active safety significant confinement ventilation systems in conjunction with passive building structure in accordance with the criteria established in DOE-STD-3009, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*.

The IRP concludes that the TWPC PB ventilation systems evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide. No gaps were identified.

The IRP recommends that the Program Secretarial Office and Central Technical Authority accept the TWPC PB Ventilation System Evaluation.

Results of Independent Review Panel's Review of the TRU Waste Processing Center (TWPC) Ventilation System Evaluation Report

1. INTRODUCTION

The Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2004-2 Independent Review Panel (IRP) reviewed the Oak Ridge Operations (ORO) TRU Waste Processing Center (TWPC) Processing Building (PB) Ventilation System Evaluation Report utilizing the process and criteria outlined in the Department of Energy's (DOE's) *Ventilation System Evaluation Guidance for Safety-Related and Non-Safety-Related System* (2004-2 Ventilation System Evaluation Guide).

As stated in Revision 1 of the DNFSB Recommendation 2004-2 Implementation Plan, the focus of the ventilation system evaluation is to:

- Verify that appropriate performance criteria are derived for ventilation systems
- Verify that these systems can meet the performance criteria, if applicable, and
- Determine if any physical modifications are necessary to enhance safety performance.

The IRP team reviewed the TWPC PB Ventilation System Evaluation Report to determine whether it was performed in accordance with the 2004-2 Ventilation System Evaluation Guide; evaluate the appropriateness of the evaluation results and methods proposed for eliminating identified gaps, if any, (between the existing ventilation system and applicable performance criteria); and provide any additional input considered appropriate to the responsible program and site offices.

2. FACILITY AND VENTILATION SYSTEM OVERVIEW

The TWPC, located in the Melton Valley area of the ORO, is responsible for retrieval, treatment and packaging of TRU/Alpha low level radioactive waste for offsite disposal. The TWPC PB is a Hazard Category 2 facility with very little potential for accidents that result in consequences approaching the Evaluation Guidelines (EGs) to the public or off-site workers.

The current confinement strategy for the TWPC facility is to utilize active safety significant confinement ventilation systems in conjunction with passive building structure in accordance with the criteria established in DOE-STD-3009, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses*.

3.0 REVIEW RESULTS

3.1 Derivation of Ventilation System Performance Criteria and Confinement Strategy

The TWPC PB ventilation evaluation appropriately followed the process outlined in the 2004-2 Ventilation System Evaluation Guide in developing the Data Collection Table used to identify accidents, their unmitigated consequences, and the confinement strategy based upon the Documented Safety Analysis Report for the TWPC. Furthermore, the Data Collection Table included the performance expectation for the ventilation systems.

For the TWPC, the PB ventilation system is designated as active safety-significant. Based upon this evaluation, ORO determined that the TWPC PB Ventilation System was appropriately functionally classified as Safety Significant.

The IRP concluded that the FET appropriately reviewed the safety classification of the ventilation system as specified in the 2004-2 Evaluation Guide.

3.2 Evaluation of Ventilation System Against the Selected Performance Criteria

The TWPC PB ventilation report evaluated the TWPC PB confinement ventilation systems utilizing the safety significant criteria from the 2004-2 Ventilation Evaluation Guide. The TWPC Ventilation System Evaluation Report provides a systematic evaluation of the ventilation systems against the 2004-2 performance criteria to identify any gaps. No gaps were identified.

The IRP concluded that evaluation of the ventilation systems against the 2004-2 Ventilation System Evaluation performance criteria was appropriately performed.

4. CONCLUSIONS

IRP concludes that the TWPC PB ventilation systems evaluation was performed in accordance with the criteria in the DNFSB 2004-2 Ventilation System Evaluation Guide.

5. RECOMMENDATIONS

The IRP recommends that the Program Secretarial Office and Central Technical Authority accept the TWPC PB Ventilation System Evaluation.

6. REVIEW TEAM MEMBERS

James O'Brien, IRP Chairman, Office of Health, Safety and Security
Robert Nelson, IRP Member, Office of Environmental Management

Note: The IRP has established a review process that includes an initial review by two members of the IRP to determine whether the evaluation: (1) is consistent with the implementation plan methodology and expectations (including choice of evaluation criteria) and (2) was performed and documented with an appropriate the level of detail and rigor.

A detailed-full IRP team review will be performed if the ventilation evaluation report is not consistent with the implementation plan, was not performed with an appropriate level of detail or rigor (after consultation with the report developers), or has unique ventilation strategies, gap analysis, or corrective actions that warrant full IRP review.

For the TWPC PB evaluation, a detailed-full IRP team review was not determined to be necessary.