

Evaluation of the Safety of the Situation

for

The Drum Event at ARP V (WMF-1617)



Fluor Idaho, LLC, is the Idaho Cleanup Project Core contractor for the U.S. Department of Energy

EVALUATION OF THE SAFETY OF THE SITUATION FOR THE DRUM EVENT AT ARP V (WMF-1617)	Identifier: ESS-137
	Revision*: 1
	Page: 1 of 8

ARP	ESS	For Additional Info: http://EDMS	Effective Date: TBD
-----	-----	---	---------------------

Manual: NA

Change Number:

*The current revision can be verified on EDMS.

Evaluation of the Safety of the Situation for the Drum Event at ARP V (WMF-1617)

On April 25, 2018, analysis of new information at the Accelerated Retrieval Project (ARP) and Advanced Mixed Waste Treatment Project (AMWTP) resulted in a potential inadequacy in the safety analysis (PISA). The background information, declaration of the PISA, and the compensatory measures are documented in unreviewed safety question (USQ)-119493, “Sludge Repackaging Project Drum Event at the Accelerated Retrieval Project V, WMF-1617.”¹ The USQ determination² was performed as required by management control procedure (MCP)-123, “Unreviewed Safety Questions,”³ and resulted in a positive USQ determination.

This document contains the evaluation of the safety of the situation (ESS) for this discovery and the resultant positive USQ determination. Revision 1 of this document addresses the resumption of operations at ARP V to process the remaining waste in the facility and extending the Operational Restrictions to ARP VII once the Debris Repackaging Project (DRP) is completed and prior to resuming the Sludge Repackaging Project (SRP) in ARP VII.

1. Description of Occurrence and Immediate Compensatory Measures

At approximately 2235 on April 11, 2018, a fire alarm was received from the ARP V (five) facility, WMF-1617. A repackaged sludge drum experienced an exothermic event which ejected the drum lid off the drum. There were no workers in the facility at the time. The fire department responded. One drum was observed with a lid off; no flames were observed. The firefighters applied Metal X extinguishing media to the drum, which was ineffective; the three firefighters then exited the facility. The Sludge Repackaging Project treatment process involves opening of waste drums using an excavator, removal or treatment of prohibited items within the sorting table by the excavator, loading waste onto trays, performing a certified visual examination within drum packaging stations, and then loading the waste into new vented 55 gallon drums. Initial characterization Real Time Radiography (RTR) of the drums revealed the drums were homogeneous solids. Operator’s eyewitness accounts confirmed that visual examination showed no liquids were present during treatment processing and no additional material was added for liquid absorption. Reentry into the facility to perform characterization of the facility occurred on April 19, 2018. Four drums were discovered upon reentry to have displaced their lids.

The ARP and AMWTP nuclear facility managers (NFM) declared a PISA at 12:15 p.m. on April 25, 2018 (ORPS EM-ID--FID-RWMC-2018-0001).⁴ USQ-119493, Revision 0, documented the basis for declaring the potential inadequacy and listed the following immediate compensatory measures:

ARP V (WMF-1617):

- ARP V will remain in WARM STANDBY mode. Recovery actions, including necessary WASTE HANDLING, to establish a safe configuration or prepare for return to OPERATION may be performed while in WARM STANDBY. Remaining in WARM STANDBY will prevent WASTE HANDLING or other activities that could lead to packaging drums that could lead to a similar reaction/event (loading drums for decontamination efforts is permitted). Sampling, decontamination, and other effort to recover from the event are permitted under WARM STANDBY.

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**Identifier: ESS-137
Revision*: 1
Page: 2 of 8

- Daily thermal monitoring of IDC176 drums loaded on the trailer located west of WMF-698 when personnel are working in the SDA until the drums are returned to AMWTP for storage (since removed with DOE approval). Thermal monitoring will be performed on IDC176 drums prior to entry into the area of ARP V where the drums are located. The thermal monitoring will look for temperature increase that would be indicative of a similar type reaction occurring.

AMWTP:

- Daily thermal monitoring of IDC176 drums that were packaged through ARP V and have been returned to AMWTP as IDC CW 216 drums will be performed. The thermal monitoring will look for temperature increase that would be indicative of a similar type reaction occurring (since removed with DOE approval).

After discussions with Department of Energy Idaho Operations Office (DOE-ID), the compensatory measures were revised and documented in USQ-119493, Revision 1⁵. The revised compensatory measures are as follows:

ARP V (WMF-1617):

- ARP V will remain in WARM STANDBY mode. Recovery actions, including necessary WASTE HANDLING, to establish a safe configuration or prepare for return to OPERATION may be performed while in WARM STANDBY. Remaining in WARM STANDBY will prevent WASTE HANDLING or other activities that could lead to packaging drums that could lead to a similar reaction/event (loading drums for decontamination efforts is permitted). Sampling, decontamination, and other effort to recover from the event are permitted under WARM STANDBY.
- Daily thermal monitoring of IDC176 drums loaded on the trailer located west of WMF-698 when personnel are working in the SDA until the drums are returned to AMWTP for storage (since removed with DOE approval). Thermal monitoring will be performed on IDC176 drums prior to entry into the area of ARP V where the drums are located. Prior to and immediately following movement of IDC176 drums and IDC216 drums (daughter drums of IDC176 drums), thermal monitoring will be performed. Thermal monitoring will also be performed periodically during decontamination/cleanup efforts and any waste sampling evolutions. The thermal monitoring will look for temperature increase that would be indicative of a similar type reaction occurring. Should elevated temperatures be observed (the currently thermal imaging equipment indicates temperatures differences in 10 °F increments and can be used to detect increased temperatures), drum or waste movement will be stopped and personnel will evacuate the immediate area.

AMWTP:

- Daily thermal monitoring of IDC176 drums that were packaged through ARP V and have been returned to AMWTP as IDC CW 216 drums will be performed. Prior to and immediately following movement of IDC176 drums and IDC216 drums (daughter drums of IDC176 drums), thermal monitoring will be performed. The thermal monitoring will look for temperature increase that would be indicative of a similar type reaction occurring. Should elevated temperatures be observed (the currently thermal imaging equipment indicates temperatures differences in 10°F increments and can be used to detect increased temperatures), drum or waste movement will be stopped and personnel will evacuate the immediate area (since removed with DOE approval).

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**

Identifier: ESS-137

Revision*: 1

Page: 3 of 8

ARP VIII and ARP IX:

After further discussions with DOE-ID, the compensatory measures were revised and documented in USQ-119493, Revision 3.⁶ The following compensatory measure was added:

- No waste exhumation or packaging of exhumed waste from the ARP VIII or ARP IX footprint shall be performed in ARP VIII or ARP IX (since removed with DOE approval).

2. Results of Immediate and Subsequent Safety Analyses and USQ Determination

This section provides an analysis of the discovered conditions and the compensatory measures that were put in place to confirm that, since discovery, the safety of ARP V, ARP VIII, ARP IX, and AMWTP has been maintained and provides the results of the USQ determination.

ARP V has not repackaged radioactive material through the drum packaging stations (DPS) since the event and remains in WARM STANDY MODE. Cleanup/decontamination activities have been performed as recovery actions to establish a safety configuration as allowed in WARM STANDY. These activities have included sampling, vacuuming of the bulk material ejected from the drums, and application of fixatives to control contamination. AMWTP performed thermal imaging of IDC CW 216 waste drums that were processed through ARP V for an extended period of time. No temperature increases in the repackaged drums were observed.

The compensatory measures from USQ-119493 Revision 3 continue to maintain the facilities in a safe condition. The compensatory measures for ARP V preclude waste repackaging of waste materials associated with the event. The additional Operational Restrictions that allowed the resumption of exhumation and waste packaging are discussed in Section 7.

The USQ-119493 determination concluded that the new information constituted a positive USQ.

3. Results of Subsequent Safety Analyses as to Safety of the Facility

Two events from the hazard analysis in Chapter 3 of Safety Analysis Report (SAR)-4 are impacted by the new information and are discussed below. The new likelihoods for these events are presented for DOE approval in this ESS. The potential impacts are discussed for each of the two events below.

Event 2.b.1 Energetic reaction of incompatible materials releasing radiological material and/or hazardous chemicals.

SAR-4 states, “A chemical compatibility analysis of materials in the SDA excavation area has been performed.⁷The analysis examined the binary combinations of chemicals known to be present in the area being excavated. The result of the examination is that there are no anticipated or postulated reactions that could lead to explosion, rupturing of containers, fire, or uncontrolled releases. The analysis did not address liquids in sealed containers due to the unknown nature of the material. Most liquids are expected to be aqueous solutions of low hazard and the probability of hazardous materials being in proximity and mixing inadvertently is low. The analysis did not rule out reactions during fire events. The analysis also did not rule out the possibility of slow reactions at ambient temperatures or reactions during storage. However, it does conclude that during storage, reactions leading to heat buildup and a runaway reaction, fire, explosion, or uncontrolled releases of toxic gases at a rate sufficient to constitute a danger to human health would not occur without a strong external heat source. A separate chemical compatibility evaluation was performed for the DRP in WMF-1619. The results of this study identified no chemical incompatibilities and determined that no adverse reactions at ambient temperature would be expected during repackaging activities.^{8,9}The probability of having an overpressurization, fire, explosion, or release of large quantities of hazardous gases from the mixing of incompatible chemicals is conservatively assessed as being unlikely, with inadvertent spill and mixing being the most credible

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**

Identifier: ESS-137

Revision*: 1

Page: 4 of 8

cause.”

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Event 2.d.iv During storage, monitoring, or drum handling, resulting from any initiator/cause, a hydrogen or other flammable gas explosion or fire occurs that involves a repacked vented or unvented drum.

SAR-4 states, “The potential exists for hydrogen or other flammable gases to be released from TRU drums when handled or stored. Vents are installed in ARP and SRP product drums to release flammable gases as they are produced, ensuring a noncombustible concentration in the drum. Such gases could accumulate in a drum if the filters were to become plugged or were inadvertently not installed, for example, and then gases could build up to flammable levels. Such a buildup is expected to require years, recognizing that the radiological content in product drums is typically less than 2 PEC. Lid expulsion is possible only for a hydrogen concentration in excess of 8% assuming ignition and, therefore, such an accumulation in an ARP product drum is not judged to be credible. For a credible case with less than 8% hydrogen, a contained deflagration or a deflagration upon venting remains possible, but lid expulsion would not occur. Propagation also is not considered credible for ARP product drums, in part because the neighbors of a failed drum are expected to be equipped with operable vents. A deflagration in a repackaged vented or unvented drum is considered to be extremely unlikely and is enveloped by this scenario.”

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Six events from the hazard analysis in Appendix B of RPT-DSA-02 are impacted by the new information and are discussed below. The new likelihoods for these events are presented for DOE approval in this ESS. The potential impacts are discussed for each of the six events below.

Event 49 A release of radioactive or hazardous materials during container characterization due to explosion during characterization. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Event 61 A release of radioactive or hazardous materials during container transport due to explosion. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Event 75 A release of radioactive or hazardous materials during container storage module due to explosion. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

EVALUATION OF THE SAFETY OF THE SITUATION FOR THE DRUM EVENT AT ARP V (WMF-1617)	Identifier: ESS-137 Revision*: 1 Page: 5 of 8
---	---

Event 105 A release of radioactive or hazardous materials during container WIPP characterization due to explosion. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Event 278 A release of radioactive or hazardous materials during characterization in WMF-610 due to explosion. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

Event 302 A release of radioactive or hazardous materials during characterization/storage in WMF-628 due to explosion. (Unlikely)

Based on the event that occurred in ARP V, the likelihood category of this accident is being changed to anticipated. Based on the risk binning, the increase in likelihood for this event does not require the selection of additional controls.

4. Current Operational Status of Facility

ARP V is currently in WARM STANDBY MODE. Recovery actions, as allowed under WARM STANDBY MODE, are ongoing.

ARP VIII has resumed waste exhumation and repackaging of waste exhumed from the ARP VIII footprint utilizing the additional Operational Restrictions in Section 7.

ARP IX has not commenced waste exhumation and repackaging of waste exhumed from the ARP IX footprint. ARP IX will utilize the same controls as those currently being used in ARP VIII.

5. Compensatory Measures Needed to Maintain the Facility in a Safe Condition

The compensatory measure identified in USQ-119493 Revision 3 (Section 1 of this ESS) in combination with other safety basis controls already approved and implemented, currently remain in effect for ARP V to maintain the facility in a safe condition.

The compensatory measure for ARP V will be removed with DOE approval of this revision to ESS-137. The Operational Restrictions in Section 7 in combination with other safety basis controls already approved and implemented at ARP V, will be used to maintain the facility in a safe condition and allow the processing of the remaining waste in the facility.

6. Path Forward

Sampling of the ejected material was performed to help determine the cause of the event. RPT-1662¹⁰ concluded that an oxidation reaction, initiated during repackaging, involving depleted uranium, generated sufficient heat to accelerate the hydrolysis of beryllium carbide yielding methane gas and internal pressure sufficient to eject the drum lids and expel a portion of the drum contents. The analysis in Section 3 identified several events affected by the new information and identified controls to ensure worker safety. These operational restrictions are presented in Section 7. Upon DOE approval of this ESS, the compensatory measure will be removed in ARP V. Engineering Design File (EDF)-11124¹¹

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**

Identifier: ESS-137

Revision*: 1

Page: 6 of 8

summarizes the results of thermal modeling performed to support resumption of waste processing and packaging efforts in ARP V to process the remaining waste in the facility. The results of the modeling effort indicate a surface temperature increase of 8.9°F can be expected in 16.6 hours; such a temperature rise is detectable using the thermal imaging equipment. Daily thermal monitoring of SD-176 drums that were packaged through ARP V and have been returned to AMWTP as CW-216 drums was performed after the event with no indication of increased temperatures in any of the drums. Any reaction that would have occurred would have occurred in a matter of hours and not days to months later. No SD-176/CW-216 drums have been processed and sent to AMWTP since April 11, 2018 (excluding those that had already undergone processing in ARP V and were on a trailer at WMF-698 awaiting return to AMWTP). ARP V will commence processing of the remaining 27 trays of processed waste in the Retrieval Area, 4 overpacked event drums, 3 drums of cleanup debris, 15 collection drums from vacuuming activities, and the 37 unprocessed drums still in the facility once this revision to this ESS is approved. The waste material in the trays of processed waste, overpacked event drums, drums of cleanup debris, and collection drums from vacuuming activities has already been disturbed and no increase in temperature or reaction has been observed in the drums or trays. The remaining unprocessed drums will be processed utilizing the Operational Restrictions in Section 7. A review of the RTR and nondestructive assay (NDA) results was performed for the unprocessed drums.¹² RTR review of these drums found no indication of turnings, shavings, scrap, or dense chunks similar to the ARP V event drums. Based on the documented review, the processing of these drums will be done in accordance with the Operational Restrictions in Section 7. Additional measures will be taken to minimize mixing the contents between drums. The SRP will proceed forward in ARP VII, once the Debris Repackaging Project is complete, processing known IDCs with chemical compatibility evaluations that have been completed. Lack of generator traceability IDCs will require additional chemical compatibility evaluations prior to processing in ARP VII.

The likelihood of the affected events will be updated and to identify the derived controls. The revised likelihoods and controls will be included in future Documented Safety Analysis (DSA) updates. In addition, the discussion for the affected events will be updated to reflect the new information.

7. Proposed Operational Restrictions

The following Operational Restrictions for ARP V, VII, VIII, and ARP IX are submitted for DOE approval:

1. Exhumed homogeneous solids (sludge/soil) target waste or suspect target waste and SRP waste displaying a uranium signature or exhumed waste or SRP waste containing potentially reactive or pyrophoric metals (including but not limited to fines, chips, and machine turnings) found in the waste matrix shall be raked in the waste tray, on the sorting table, or in the raking tray in the Retrieval Area and the waste shall be evenly distributed once placed within the waste tray.

Discussion: Exhumed target homogeneous solids (sludge/soil) or SRP waste may be placed in trays and transferred to a fissile material monitor (FMM) waste screener to determine if it has a uranium signature. Operations may choose to assume all trays have a positive uranium signature and bypass the FMM waste screener and rake all trays of waste to meet this requirement. All SRP waste will be raked to meet this requirement. If the material does not contain uranium as demonstrated by the FMM, it will continue through processing as prescribed in the current ARP/SRP procedures. If the target sludge/soil displays a uranium signature, it will go through additional processing steps to ensure the uranium is stable before being loaded into the output drums. Although the ARP V initiator has been identified as depleted uranium, for completeness, potentially reactive or pyrophoric metals (including but not limited to fines, chips, and machine turnings) found in the waste matrix will go through additional processing steps to ensure the metals have a chance to react before being loaded into the output drums. Specifically, the target sludge/soil will be raked in the Retrieval Area in the tray to mix the material and expose it to

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**

Identifier: ESS-137

Revision*: 1

Page: 7 of 8

oxygen thereby initiating any potential reactions or ensuring that the material has been oxidized. The ARP V event is believed to have started when the waste material was exposed to the air. Dumping the material into a tray and raking the material will mix the waste and allow any potential reaction to commence. Once raked, the waste material will be evenly distributed within the tray, to the extent practical, to form a uniform depth of the waste material. Evenly distributing the material in the tray will prevent mounding of the material and make detecting a reaction based on a thermal imaging more reliable. The target sludge/soil will remain staged for a minimum of 24 hours to allow for any reaction to begin so that the reaction occurs in the Retrieval Area instead of in the DPSs or in a newly repackaged drum. If evidence of potentially reactive or pyrophoric metals are observed when the waste is being processed in a DPS, evidenced by sparking, smoking, or other indications of a reaction in progress, and the waste has not been previously raked and staged in the Retrieval Area for a minimum of 24 hours (this would only occur if the tray of waste material did not initially display a uranium signature and was allowed to go directly to a DPS), the tray will be returned to the Retrieval Area where it will be raked and staged for a minimum of 24 hours prior to processing through a DPS for repackaging.

2. Exhumed homogeneous solids (sludge/soil) target waste or suspect target waste and SRP waste displaying a uranium signature or exhumed waste or SRP waste containing potentially reactive or pyrophoric metals (including but not limited to fines, chips, and machine turnings) found in the waste matrix shall be staged in the Retrieval Area and shall be thermally monitored for elevated temperatures (above ambient) after a minimum 24 hour holding period.

Discussion: The reaction that led to the four drums displacing their lids that occurred in ARP-V occurred well within 24 hours after the drums had been loaded and the lids secured with a filter installed. Exothermic reactions involving roaster oxides during exhumation at the ARP have occurred immediately upon exposing the material to the atmosphere. Thermal modeling for a tray containing 500 g of depleted uranium evenly distributed in the lower half of the waste material was analyzed and the results summarized in EDF-11124. This configuration represented a conservative worst case with regard to detecting a temperature increase at the surface of the waste material in a tray (low depleted uranium mass, dispersed energy density, and insulated by waste overburden). The results of the modeling effort indicate a surface temperature increase of 8.9°F can be expected in 16.6 hours; such a temperature rise is detectable using the thermal imaging equipment used at the ARP/SRP facilities. Based on the conclusions in EDF-11124, a 24 hour holding period will allow reactions to occur and the heat to conduct through the material yielding a thermal profile sufficient to be detected by thermal imaging equipment. EDF-11124 modeled a depleted uranium reaction. However, the rake and hold control is used to look for any exothermic reaction. The rake and hold control disturbs the exhumed waste to start any potential reactions and then uses thermal imaging to look for any temperature increases that would be indicative of an ongoing reaction whether it be from reactive or pyrophoric metals or exothermic chemical reactions. ARP V does not have an FMM waste screener, so all SRP waste in ARP V will be raked and held for a minimum of 24 hours to meet this requirement. The thermal imaging equipment in the ARP/SRP facilities indicate temperature differences and can be used to detect increased temperatures. The accuracy of the currently installed thermal monitoring equipment is +/- 3.6 °F. With this accuracy the equipment will be able to detect temperature increases above ambient. If after the 24 hour holding period the temperature of the target waste in the tray is observed to be above ambient, the tray will remain in the Retrieval Area allowing any potential reactions to continue and prevent it from being brought through a DPS. The material will be raked again and the 24 hour holding cycle will be repeated. The cycle of raking and holding the material in the tray will be continued until the temperature is measured to be at ambient at the end of a holding period. If a reaction occurs during the 24 hour holding period, it will not have to be raked and held any further as long as the temperature returns to ambient by the end of the 24 hour minimum holding period. Further evaluation/characterization of the waste material may be

**EVALUATION OF THE SAFETY OF THE SITUATION
FOR THE DRUM EVENT AT ARP V (WMF-1617)**

Identifier: ESS-137

Revision*: 1

Page: 8 of 8

needed before allowing the tray to be processed through a DPS. The combination of raking the material in the Retrieval Area, monitoring the thermal condition of the material in the waste tray, and the 24 hour hold time is expected to give the material sufficient time to result in a detectable temperature rise while still in the Retrieval Area.

8. Summary of Recommendations and Conclusions

This ESS demonstrates that the facilities have been in a safe condition commencing with the identification of the inadequacies identified in USQ-119493 and implementation of the compensatory measures and Operational Restrictions. The USQ determination is positive and results in the revision of the events specified in Section 3 and identifies controls in Section 7 to ensure worker safety.

DOE approval of the effects of the new information on the above analyzed events is requested. Upon DOE approval of this revision to the ESS, the current compensatory measure will be removed for ARP V and replaced with the Operational Restriction in Section 7. The affected events will be updated to identify the derived controls. The new accident likelihoods and controls will be included in an update to SAR-4 and RPT-DSA-02. The Operational Restriction in Section 7 will be used in ARP VII when the SRP begins processing and repackaging activities in the facility after completion of the activities to support the DRP.

9. References

1. USQ-119493, "Sludge Repackaging Project Drum Event at the Accelerated Retrieval Project V, WMF-1617," Rev. 0, April 25, 2018.
2. USQ-119493, "Sludge Repackaging Project Drum Event at the Accelerated Retrieval Project V, WMF-1617," Rev. 2, May 30, 2018.
3. MCP-123, Unreviewed Safety Questions, Rev. 16, November 9, 2017.
4. ORPS Notification Report ORPS EM-ID--FID-RWMC-2018-0001, "ARP V Drum Over-pressurization Event," April 17, 2018.
5. USQ-119493, "Sludge Repackaging Project Drum Event at the Accelerated Retrieval Project V, WMF-1617," Rev. 1, May 1, 2018.
6. USQ-119493, "Sludge Repackaging Project Drum Event at the Accelerated Retrieval Project V, WMF-1617," Rev. 3, June 5, 2018.
7. EDF-5307, "Chemical Compatibility and Inventory Evaluation for the Accelerated Retrieval Project," Rev. 2, R. R. Kimmitt, October 16, 2014.
8. EDF-10841, "Chemical Compatibility Evaluation for RWMC WMF-1619 Debris Repackaging Project," Rev. 0, February 15, 2016.
9. RPT-ESH-014, "Chemical Compatibility Evaluation Of Wastes For The Advanced Mixed Waste Treatment Project," Rev. 9, November 9, 2015.
10. RPT-1662, "Analysis of Drum Lid Ejections – ARP V," Rev. 0, November 20, 2018.
11. EDF-11124, "ARP-VIII Resumption and Supporting Thermal Analysis," Rev. 0, July 12, 2018.
12. EPF-MISC-1419, "Processing Remaining Sludge Waste in WMF-1617," Rev. 0, January 31, 2019.