HWMA/RCRA STORAGE and TREATMENT PERMIT
for the
MATERIALS AND FUELS COMPLEX (MFC)

ATTACHMENT 6
Sections F-3 through F-5, Procedures to Prevent Hazards

EFFECTIVE DATE: OCTOBER 1, 2015
REVISION DATE: APRIL 17, 2018
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F-3 Prevention and Preparedness (IDAPA 58.01.05.008; 40 CFR 264 Subpart C)

F-3(a) Equipment Requirements (IDAPA 58.01.05.008; 40 CFR 264.32)

This subsection documents compliance with the preparedness and prevention equipment requirements. The required equipment includes internal and external communication equipment, emergency equipment, and water for fire control.

F-3(a)(1) Internal Communications [IDAPA 58.01.05.008; 40 CFR 264.32(a)]

MFC uses a site-wide emergency signal and paging system to alert facility personnel of emergencies (ref. Attachment 7, Section G, Contingency Plan). Attachment 7 shows the signals used and, for each signal, the type of emergency and required action. All MFC personnel are trained to respond appropriately to these signals. The siren signals are Site-wide, while radiation alarms are facility-specific. Emergency messages can be sent over the MFC paging system.

F-3(a)(2) External Communications [IDAPA 58.01.05.008; 40 CFR 264.32(b)]

The means of communication between HWMA unit and emergency-response personnel includes telephones, cellular phones, radios and fire-alarm pullboxes. The dial 911 emergency telephone system enables an individual to dial the numbers 911 on any business telephone, which will then put the individual in contact with emergency-response personnel. For cellular phones, 911 is used. In areas where cellular phones are not allowed business telephones, radios, or fire alarm pullboxes are in place. Fire-alarm pullboxes automatically notify the INL site-wide Fire Alarm Center. The Fire Alarm Center then communicates the pullbox location information to Station No. 2 (located at the MFC) Fire Department personnel.

F-3(a)(3) Emergency Equipment [IDAPA 58.01.05.008; 40 CFR 264.32(c)]

The MFC HWMA units have facility-specific emergency equipment available (for their use in the unit) that is regularly inspected and maintained (ref. Attachment F-3). This equipment, and its quantities, locations, and capabilities, are identified in Attachment 4, Section F, and Attachment 7, Section G (ref. Attachments F-4 and G-2). Emergency access routes to emergency-response equipment for use at the HWMA units are shown in Attachment 7, Section G, Contingency Plan, Attachment G-3.
Water for Fire Control [IDAPA 58.01.05.008; 40 CFR 264.32(d)]

Water for fire control of non-reactive HW/MW fires is available throughout the MFC site for use in each HWMA unit as identified in Attachment 7, Section G, Contingency Plan. Water is not used for control of fires involving water reactive HW/MW; the use of water to fight reactive metal fires would only accelerate the fire. Instead, Class D extinguishing media, which is formulated for reactive metal fires, is used to fight these fires. Water is used for fire control only if reactive HW/MW is not involved, or if the fire department or facility manager determines it is appropriate for the situation.

Fire control is evaluated at MFC facilities by the fire engineers. Certain facilities are required to have a Fire Hazard Analysis, while all facilities are required to have a Fire Safety Assessment. If conditions change the fire engineers use procedures to modify the assessments. Each assessment describes the conditions found in the building and the appropriate corresponding fire controls.

Controls such as isolation from water, carbon dioxide and Met-L-X fire extinguishers, halon, and fire barriers may be appropriate for non-water fire control.

Access to Communication or Alarm System [IDAPA 58.01.05.008; 40 CFR 264.34]

Whenever hazardous waste is being handled personnel involved have access to the types of alarms or communication systems as specified in Section F-3(a)(2).

Aisle Space Requirements (IDAPA 58.01.05.008; 40 CFR 264.35)

In accordance with National Fire Protection Association (NFPA) 101, The Life Safety Code (LSC) for Industrial Occupancies (National Fire Protection Association) and Occupational Safety and Health Standards (OSHA), a minimum of 3 feet of aisle space is maintained for any means of ingress or egress into the MFC HWMA units. Placement of containers and process equipment within the HWMA unit in accordance with this minimum aisle spacing requirement ensures unobstructed movement of emergency response personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of the facility operation in an emergency.
RSWF staging/storage area and NFA store 8 ft x 8 ft x 20 ft cargo containers.

Each cargo container is accessible through side loaded or end loaded doors. The cargo containers will be separated to allow for the doors to be opened to facilitate container movement. Based on the restricted access within cargo containers and the limited area (160 ft²) containers are centered along the long axes of the cargo container to provide adequate inspection of containers. Adequate space will be maintained between each container and containers on pallets. Also, adequate space will be maintained for inspecting the entire area between and around cargo containers, ISCs or other DOT type containers. A 3-ft aisle space will be maintained between rows of containers stored on the pads.
F-4 Prevention Procedures, Structures, and Equipment

F-4(a) Loading and Unloading Operations [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(i)]

HWMA unit container loading and unloading operations include (as applicable to the specific unit) the following:

- Unloading containers of HW/MW from trucks or trailers and casks using forklifts, mobile cranes, or facility cranes
- Moving containers from HWMA storage areas to the HWMA unit process areas and/or to another HWMA unit storage or treatment facility
- Daily inspection following transfer operations.

Hazards that may result from loading and unloading operations are minimized by the use of trained and qualified rigging and hoisting operators, trained material handling personnel, proper handling of containers and inspection of containers as described in Attachment 1, Section D, Process Description.

F-4(b) Run-On and Run-Off [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(ii)]

F-4(b)(1) Indoor HWMA Units

Containers of HW/MW are elevated off the floor during storage (e.g., stored on secondary containment pallets or skids or by container design), ensuring that the containers do not come in contact with runoff from HW/MW handling operations or run-on from precipitation. Note: During processing, containers may be staged on the floor as required by the process.

F-4(b)(2) Outdoor HWMA Unit (RSWF, RSWF Staging/Storage Area and NFA)

MW stored in the RSWF is contained within welded cathodically protected steel liners with the tops of the liners above (approximately 4 inches) ground level. The RSWF is graded to slope gently from the centerline to the parallel sides. This serves to prevent run-on of precipitation toward the liners and facilitates run-off of precipitation away from the liners.

Waste containers stored at RSWF staging/storage area and NFA are stored within cargo containers, ISCs, or other DOT type containers that prevent the containers from coming into contact with precipitation. The cargo containers are kept closed, which effectively seals the containers against precipitation. The cargo containers
are designed with skids keeping the cargo containers elevated. The ISCs are
designed to sit on the ground. Any waste drums within the ISCs will not come
into contact with run-on liquids, as the ISCs are designed to be waterproof.
Additionally the ISCs are kept closed to prevent accumulation of precipitation.
Other DOT type containers used to store containers will be maintained closed and
elevated to keep containers from coming into contact with precipitation. If
pooling/puddling is identified around container(s), container(s) will be relocated.

The RSWF staging/storage area and NFA asphalt pads are approximately 1 ft
above the adjacent soil. Routine preventative maintenance will be conducted to
ensure snow accumulation is removed from the areas around HW/MW stored on
pads.

**F-4(c) Water Supplies [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(iii)]**

Contamination of water supplies due to HWMA unit operations is highly unlikely
because:

- HW/MW is stored in sealed containers; HW/MW with free liquids is
  stored in containers/tanks with secondary containment.
- HWMA units are >50 ft from the nearest site production/drinking water
  well.
- The MFC site is maintained with the necessary grading and ditches to
  channel run-off to the Industrial Waste Pond.
- MFC is more than 10 miles removed from the nearest surface water (the
  Big Lost River) protected by the Clean Water Act.
- The water table of the Snake River Plain Aquifer is > 600 ft below grade.

**F-4(d) Equipment and Power Failure [IDAPA 58.01.05.012; 40 CFR
270.14(b)(8)(iv)]**

Equipment failures are minimized and prevented by thorough preventive
maintenance and servicing programs. Possible equipment failure during HW/MW
handling activities is primarily limited to crane or hoist breakdowns in the
HWMA units. Crane breakdown could encompass motor, mechanical, and
structural failure. Failures of the cranes or hoists are minimized through routine
maintenance.
Forklift failure could encompass motor, hydraulic, mechanical, and structural failure. Rigging tackle failure could encompass breakage or deformation of slings, wire ropes, shackles, hooks, or other lifting devices. Forklift failure is minimized by routine maintenance and pre-use equipment checks. Delays in unloading and storage of waste containers as a result of forklift failure are also minimized because other forklifts are available if one is out of service.

To mitigate effects of electrical power failures:

- Ongoing operations (such as movement of HW/MW containers and treatment systems in operation) will be secured and placed in a safe condition
- Open containers of HW/MW will be closed and secured
- Automatic valves and controls in HW/MW treatment systems will fail in safe positions (as they are designed to do in case of power failures).

HWMA unit operations personnel complete facility shutdown operations, as necessary, to place equipment and waste in a safe standby configuration.

**F-4(d)(1) Equipment and Power Failure at RSWF, RSWF Staging/Storage Area and NFA**

The casks, forklift, and cranes used at the RSWF, RSWF staging/storage area and NFA are uniquely constructed or purchased to perform operations at the RSWF, RSWF staging/storage area and NFA and, as a result, equipment failure is minimized. The casks used at RSWF have very few moving parts with no electrical components to fail.

There are no electrical power requirements for RSWF staging/storage area or NFA.

**F-4(e) Personnel Protective Equipment [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(v)]**

HW/MW is received at HWMA units in closed containers. HW/MW containers are only opened for the removal or transfer of the HW/MW at the time of waste verification, repackaging, and/or treatment. When HW/MW is exposed to the atmosphere during repackaging and/or treatment, personnel are protected by personnel protective equipment (PPE), as necessary.
F-4(f)  Releases to the Atmosphere [IDAPA 58.01.05.012; 40 CFR 270.14(b)(8)(vi)]

In the event of an airborne release from a waste management unit addressed in this permit, the ventilation system in the building will direct hazardous constituents to the building’s HEPA filter off-gas system, which minimizes releases to the atmosphere.

At HFEF (MFC-785) the cell exhaust system draws air from contaminated areas around the decon cell into the decon cell and from there into the exhaust system ducts. Extensions to the cell exhaust system provide exhaust air flow from the Waste Characterization Chamber and its ancillary glove boxes. Gaseous exhaust then passes through at least two stages of HEPA filters. In addition, all containers are maintained closed while in storage, except for adding or removing waste.

At RSWF (MFC-771) air emissions are prevented by the waste being sealed within carbon steel liners. In addition, the liners contain containers that are also sealed. The liners are either welded shut or fitted with a blind flange, as applicable. The opening of waste containers is not allowed at the RSWF and therefore, is not a potential cause of air emissions.

SCMS consists of three separate buildings referred to as MFC-793, -793C, and -793G.

MFC-793 ventilation system consists of an exhaust fan, a smaller auxiliary exhaust fan, two main HEPA filter banks, an exhaust stack, and associated ductwork and dampers. The fan takes a suction from the SCMS High Bay and the SMCS Low Bay through two HEPA filter banks. The fan discharges to the outside through the exhaust stack. Dual banks of filters were installed to provide redundancy in the event of filter failure or excessive fume loading. The ventilation system draws air through the water-wash vessel and passes it through a venturi scrubber and cyclonic liquid separator, a moisture separator and air heater before discharge to the HEPA filters.

MFC-793C is a container storage building, but may also contain a containment enclosure tent for opening various radiologically contaminated or mixed waste containers for examination, maintenance, repackaging, or container treatment. If a tent is installed in the building, it would be provided with negative pressure and the ventilation system for the tent would include HEPA filtration.

MFC-793G is a container storage building. All containers are maintained closed while in storage, except for adding or removing waste.
SSB (MFC-703) is a container storage building. All containers are maintained closed while in storage, except for adding or removing waste.

RSWF staging/storage area and NFA are container storage areas. All waste containers are maintained closed while in storage.
Since the HWMA units may handle ignitable and reactive HW/MW, units managing this waste are designed, constructed, and operated to prevent accidental ignition or the reaction of the HW/MW with water or other incompatible material.

Prevent Ignition or Reaction of Ignitable or Reactive Waste [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR 270.14(b)(9) and 264.17(a)]

Engineering and administrative controls are in place at the HWMA units that manage ignitable or reactive HW/MW to prevent the accidental reaction or ignition of ignitable and reactive HW/MW and include the following:

- Protecting HW/MW containers from physical damage by minimizing handling
- Not storing incompatible materials together such as water (other than the industrial service water), corrosives, oxidizers, or halogenated solvents in the area
- The RSWF staging/storage area and NFA may store sodium contaminated solid items, which will be stored in high integrity water-tight containers. These containers are not opened for addition or removal of waste while in the RSWF staging/storage area and the NFA.
- Sodium contaminated items may be stored in cargo containers designated for their storage.
- Prohibiting sources of heat or ignition in the storage areas where ignitable or reactive HW/MW are stored
- Smoking is not allowed in the HWMA units and “No Smoking” signs are conspicuously posted
- Restricting access to HW/MW storage areas to trained personnel
- Keeping doors to HWMA units closed (when not in use) to prevent precipitation from accumulating in the storage area
- Doors to cargo containers are kept closed to prevent precipitation from accumulating in the storage area
- Using only properly trained personnel to place or remove HW/MW from
the storage areas

- When venting drums use only non-sparking tools and provide monitoring of gases
- Work control documents.

**F-5(b) General Precautions for Handling Ignitable or Reactive Waste and Mixing of Incompatible Waste** [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR 270.14(b)(9) and 264.17(b)]

The design and operating practices at the HWMA units that manage ignitable or reactive HW/MW prevent reactions that:

- Generate uncontrolled extreme heat or pressure, fire, explosions, or violent reactions
- Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to pose a risk of fire or explosion or to threaten human health or the environment
- Damage the structural integrity of containers, tanks systems or secondary containment systems.

These practices and design features are intended to separate and protect waste from sources of ignition, reaction, or spontaneous ignition, as follows:

- Incompatible waste is segregated as described in Subsection F-5(d).
- When containers are required to be opened for the purpose of HW/MW waste verification, repackaging, and/or treatment, only the containers in process will be opened.
- The atmosphere in the area where containers are opened is controlled to keep HW/MW confined. If necessary, containers will be opened in atmospheres that have appropriate ventilation or atmospheric controls with respect to areas where unopened containers or personnel are located.
- All equipment and wiring complies with applicable NFPA codes. Portable electric tools used are double-insulated or have ground fault interruption (GFI) circuit protection.
• Open-flame cutting, welding, or other similar spark or ignition sources
will not be allowed inside the HWMA unit unless repair is required on a
piece of equipment, in which case the equipment and the open flame or
spark source will be isolated to the extent feasible from the HW/MW. To
the extent necessary, the HW/MW will be transferred to one of the
HWMA unit storage/treatment areas where potential ignition sources do
not exist.

• Routine inspections of HWMA unit container storage/process areas
provide regular assessment of storage conditions and early identification
of potentially hazardous situations.

F-5(c) Management of Ignitable or Reactive Waste in Containers [IDAPA
58.01.05.012 and 58.01.05.00 8; 40 CFR 270.15(c) and 264.176]

MFC is located approximately 4 miles from the nearest INL facility property line.
A buffer zone surrounding the MFC, and including the HWMA units, is greater
than 50 ft from the property line, in compliance with IDAPA 58.01.05.008 and 40
CFR 264.176.

F-5(d) Management of Incompatible Waste in Containers [IDAPA 58.01.05.012 and
58.01.05.008; 40 CFR 270.15(d) and 264.177]

Prior to HW/MW shipment to a HWMA unit, the generator provides information
to the HWMA unit manager (or designee). The HWMA unit manager or designee
reviews this information for conformance with the Permit. This provides a check
as to whether or not the generator is placing incompatible HW/MW together in a
single container or in a single shipment (both of which are prohibited). All
HW/MW received at a HWMA unit is packaged by the generator. Information
regarding the review of generator-supplied information for compatibility is
addressed in Attachment 2, Section C, Waste Analysis Plan.

If noncompliant conditions are discovered by HWMA unit operations personnel
during the course of storage, repackaging, and/or treatment, the generator is
contacted, and the situation is evaluated and documented on a case-by-case basis.
To the extent possible, the noncompliant condition is remedied, at least to the
point where the HW/MW can be safely returned to the generator.

HW/MW generated at a HWMA unit as a result of repackaging, and/or treatment,
is packaged in compatible containers and with compatible HW/MW if
consolidated. No HW/MW generated at a HWMA unit is placed in containers
with HW/MW, or HW/MW residue, that could be potentially incompatible.
If a container of HW/MW received at a HWMA unit is incompatible with any HW/MW or materials stored nearby, it will be separated from the other HW/MW or materials, or isolated from them by means of a dike, berm, wall, or other device.

F-5(e) Management of Ignitable or Reactive Waste in Tank Systems [IDAPA 58.01.05.012 and 58.01.05.00 8; 40 CFR 270.16(j) and 264.198]

Ignitable and reactive HW/MW that is placed in the tank system used to deactivate the HW/MW (i.e., at SCMS) is managed to ensure that the waste will not react or ignite outside of the designed treatment process. The headspaces of tanks holding Na/NaK are typically filled with inert gas, nitrogen for example, to minimize the potential for an air to waste reaction. The controlled reaction of ignitable and reactive HW/MW in SCMS tank systems meets the requirements of IDAPA 58.01.05.008 and 40 CFR 264.198 and 264.17(b).

F-5(f) Management of Incompatible Waste in Tank Systems [IDAPA 58.01.05.012 and 58.01.05.008; 40 CFR 270.16(j) and 264.199]

Incompatible HW/MW will not be placed together in SCMS storage tanks or tank systems. As identified above, SCMS tank systems are designed specifically to react ignitable and reactive HW/MW with water under controlled conditions.