26 – MERCURY TRANSFER FROM A MERCURY DRUM

Title: Mercury Transfer from a Mercury Drum **Doc. No.** 2015-MMTS-26

Approval Signatures and Date

Prepared/Reviewed by:		Date:	10/29/15
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NOTE: *This document will be reviewed at least annually to ensure its suitability.*

Revision History

Rev. No.	Change description	Author
2	Reformatted. Refer to "MMTS Initial Operations Observations, Communications and Improvements for Implementation Crosswalk- July 10, 2015".	Burton Packard and Renee Rodriguez
1	Change description Crosswalk Between NDEP CAPP Review Comments (dated 2014-12-09, 2015-01-30 and 2015-02-26) and Mercury Storage and Transfer Program Document Contents March 10, 2015	Burton Packard and Renee Rodriguez

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Reference Documents

Document number	Document title
QP.EMS.HG.0007	Management of Change (Tier 1)

26.1. PURPOSE

This procedure describes the activities and requirements that are associated with recovering loose mercury and flasks of mercury from a drum.

26.2. SCOPE

This procedure covers the drum, flask and metric ton container activities for special operations in the Drum Handling Area in the event of a low-probability occurrence that a flask structural inside the drum is noted by the presence of loose mercury inside the drum. The procedure covers the special equipment and metric ton container transport and handling activities for the operators, including waste handling activities by operators in the drum handling area.

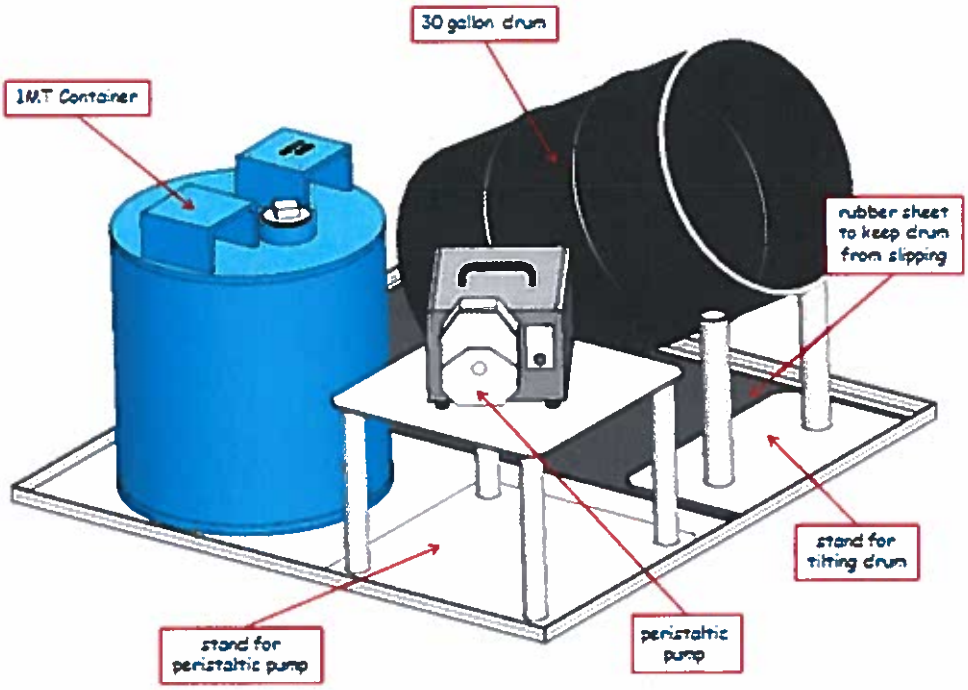
26.3. FLOWCHART

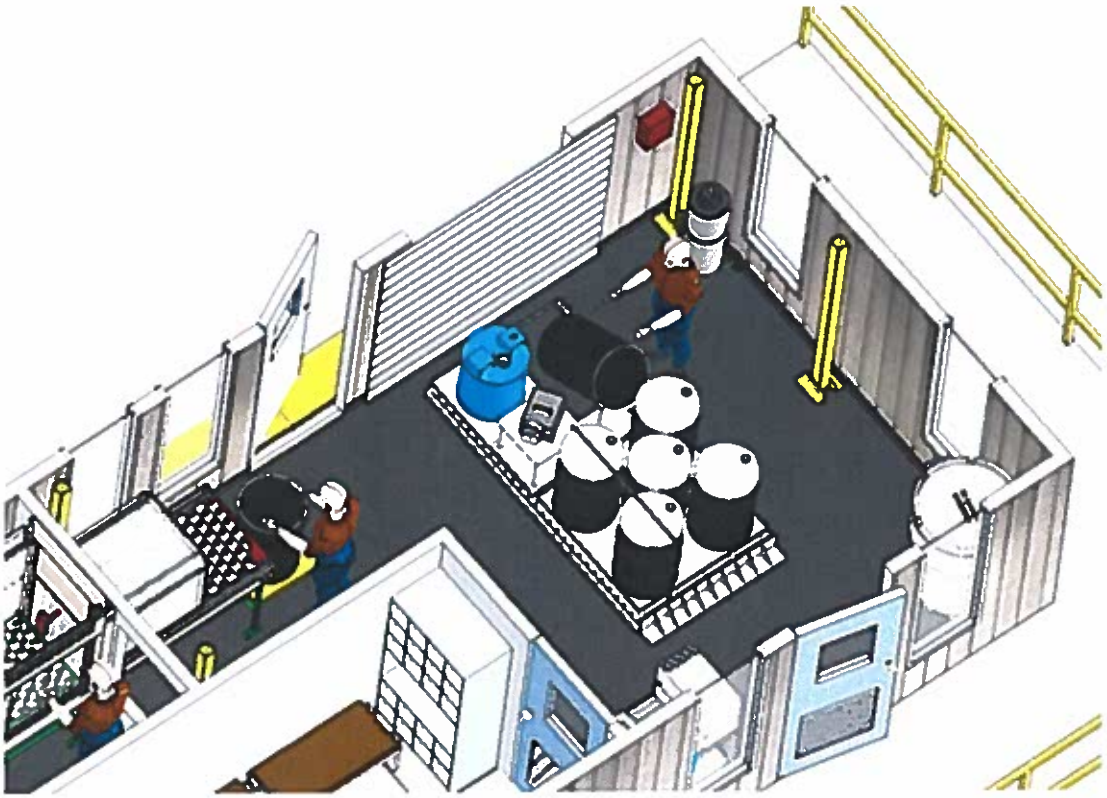
The three (3) figures below reflect the special equipment required and the lay-out for special operations in the Drum Handling Area. The special assembly of equipment sits on a catch pan, with the entire Drum Handling Area diked. As part of routine mercury flask removal the operator is required to inspect the internal drum plastic bag for free mercury. This procedure is applicable to removing that free mercury and respirators may be required, with the probability of occurrence being very small. This procedure may not be required for several of the years of operations. If a drum is identified the mercury is safely contained in the drum which sits on a catch pan when stored inside the mercury storage building. To utilize efficiencies for providing health and safety controls and maintaining the integrity of the operation, the operator may execute this procedure annually to batch a group of such drums, if required.

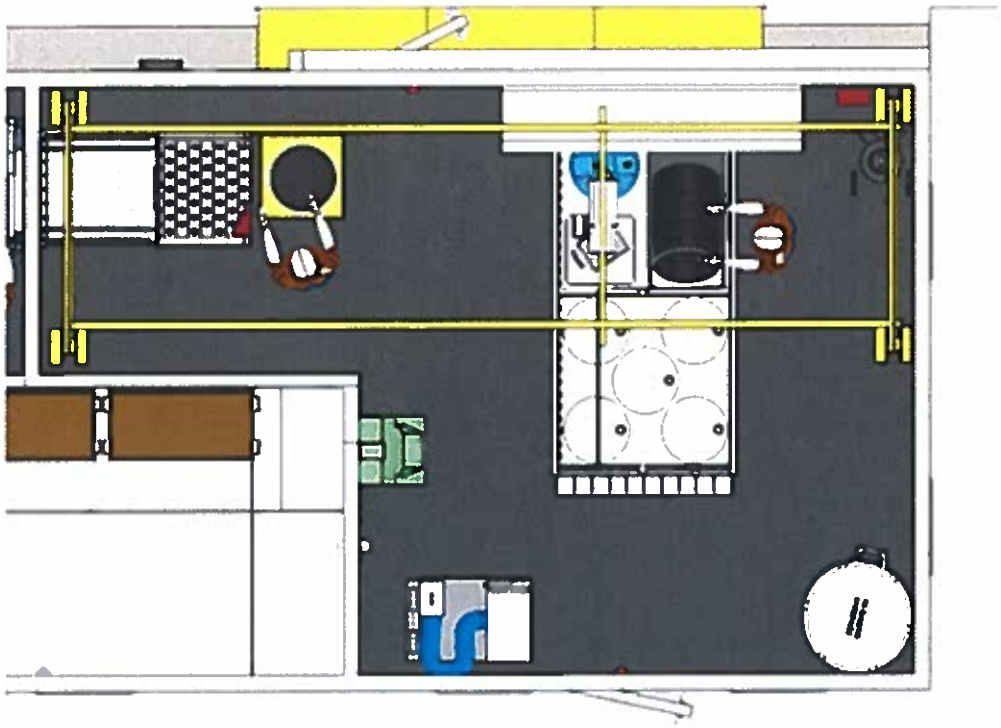
26.4. RESPONSIBILITIES

The following personnel are required to read this procedure and be trained accordingly to handle equipment and mercury containers safely and to recovery loose mercury safely from a drum:

- Supervisors and staff who oversee operations
- Drum Handling Area workers who will vent and open drums, lift flasks from drums, clean flasks, place flasks in six-pack trays, place failed flask in a bag, manage use of a portable snorkel and mercury analyzer, and remove loose mercury from the drum using the peristaltic pump. The pump directs the free mercury into a metric ton container, in similar fashion to routine Fume Hood 2 operations, but with special provisions for operating in the Drum Handling Area.
- Workers who will operate the forklift to transport equipment, drum and metric ton container. The metric ton container weight management (to acquire net mercury added to it in the Drum Handling Area) is established using the scales in the Flask Handling Area, so a couple extra forklift handling efforts are required.


30 gallon drum
IM.T Container
rubber sheet to keep drum from slipping
stand for tilting drum
stand for peristaltic pump
peristaltic pump





26.5. OPERATIONS

NOTE: The operation requires support from the full staff, as directed by the Facility Manager or designee, with careful procedure review and a dry run utilized as needed, with notes taken by an observer. The operations are not required until six months of normal operations experience are gained and lessons learned.

- Drum is placed on 4 ft ×4 ft catch pan on a pallet. The pallet and catch pan stay on the roller conveyor, which may be specially prepared with plywood and roller immobilized.
- Verify there is a waste RCRA drum ready and available, per the figures provided herein.
- The HVAC set at normal temperature. Exhaust fan is required and fume hoods and Flask Handling Room snorkels can be closed if beneficial to formation of a draft in the vicinity of the drum.
- This is a rare operation but uses routine equipment by trained operators. Set up the system initially with no mercury flasks in the MMTS and no other metric ton containers present in the MMTS.
- Inspect drum integrity since no catch pan will be used on the scale.
- Apply cheese-cloth and/or Herculite as required per experience to prepare surfaces.

- Using the drum lift fixture as normal, move drum to 1,000-lb scale for venting with portable and fixed snorkels. Use bung access first for venting.
- A portable mercury monitor is manned and used with the MMS-16.
- Verify portable snorkels and lights are laid out and ready.
- Vent drum with snorkel inside drum and drum lid partly covering drum opening.
- Operators may wear respirators but are not required unless the mercury vapor concentration trigger is met, which is 25 $\mu g/m^3$ at the breathing level. Lower concentration levels are anticipated and the operator can determine what percentage of the 8-h continuous trigger is used to don air purification respirators.
- Inspect contents and lift out flasks one at a time. Utilize scale readings to ascertain if weight per flask is ~ 84 - 90 lbs. If that criterion is met, that flask can be removed. If the 84 lb criterion is not met, the flask should be bagged and then lowered, unhooked and left in drum.
- As acceptable flasks (by weight) are elevated, wipe the bottom in vertical position and apply Merc-X and use the special Tiger-Vac mercury vacuum as appropriate.
- Continue to inspect/autopsy drum and remove flasks one at a time.
- Assume liquid mercury (likely within the drum bag) and 1 flask will remain at the bottom of drum after the other 5 flasks are removed. Utilize a heavy duty 3-gallon bag to contain the failed flask in the drum. A 'Hg Waste Solutions zip bag' could be used if desired.
- Move flask to bag at scale station.
- Remove cardboard packaging from drum at scale station.
- Move drum to 4 ft × 4 ft catch pan on pallet using a hoist.
- Use catch pan to contain metric ton and peristaltic pump and support equipment as shown in Figures.
- Have available supports to lean drum down at 30 degree angle for access.
- Use pump and deliver by closed loop the free elemental mercury to 1 metric ton container.
- Use Tiger-Vac mercury vacuum as prudent and clean-out reservoir of elemental mercury into metric ton container (using peristaltic pump).
- Take action to have accurate tare weight of metric ton container.
- Remove bags/pillow/dunnage into bags and into the RCRA waste drum.
- Clean-up traces with HgX® and apply Tiger-Vac mercury vacuum and dispose of all residuals in RCRA drum.
- Drum disposed as RCRA.
- Clean-up.
- Weigh metric ton container and manage inventory/records.

Repeat for each drum in smart manner applying lessons learned.

26.6. RECORDS

- Database entry of the quantity of mercury placed in the MT container
- Updated inventory tracking spreadsheets recording the quantity of mercury placed in the MT container.
- Operating log of equipment problems and resolution

27- DEFENSE NATIONAL STOCKPILE MERCURY INVENTORY CONTROL

Title: Defense National Stockpile Mercury Inventory Control **Doc. No.** 2015-MMTS-27

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4	Reformatted. Refer to "MMTS Initial Operations Observations, Communications and Improvements for Implementation Crosswalk- July 10, 2015".	Burton Packard and Renee Rodriguez
3	Change description Crosswalk Between NDEP CAPP Review Comments (dated 2014-12-09, 2015-01-30 and 2015-02-26) and Mercury Storage and Transfer Program Document Contents March 10, 2015	Burton Packard and Renee Rodriguez
2	Pgs 27-2 and 27-5, revised text to explain scale accuracy. Revised Table 27.1 and Attachment 27.2 spreadsheets for Building 110-98 based on updated information acquired the week beginning October 20, 2015. Corrected Example 1 in Attachment 27.1 to make it consistent with the data for Building 110-66 in Revision 1.	
1	Revised Table 27.1 and Attachment 27.2 spreadsheets for Buildings 110-66 and 110-98 based on updated information acquired the week beginning September 21, 2015.	

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Reference Documents

Document number	Document title
QP.EMS.HG.0007	Management of Change (Tier 1)