

Notes

NEWMOA Hazardous Waste Virtual Meeting

March 14, 2022

Topic: Roundtable on Hazardous Waste Compatibility Challenges

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Participants: CT DEEP (6 people); Mass DEP (8 people); NH DES (8 people); NJ DEP (3 people); NYSDEC (22 people); Puerto Rico (2 people); RI DEM (2 people); VT DEC (2 person); EPA (17 people); NEWMOA (2 people)

Call leader: Terri Goldberg, NEWMOA

Connecticut DEEP

CT DEEP has had cases where facilities failed to consider the compatibility of virgin material or hazardous waste or failed to select storage containers that are compatible with the waste stream. They have seen tank systems for bulk materials/waste that are incompatible with the materials they are storing, such as corrosive waste. Examples include:

- Reactive waste stored outside and exposed to rain or snow awaiting transfer to the site's main hazardous waste storage area.
- Drums chips of an aluminum alloy along with elemental sulfur and water-based coolant. The reaction of the water in the coolant with the elemental sulfur created sulfuric acid, which reacted with the aluminum chips, creating hydrogen gas, which over-pressurized the drums and caused them to explode.
- Lab waste alcohol was mistakenly put into drums of tumbling solution which was fed to an evaporator in an enclosed room causing an explosion / fire – this was a major enforcement case a number of years ago (note: they installed a state-of-the-art vacuum system that eliminated the explosive hazard).

These facilities were not aware of the incompatible waste.

They do not come across incompatible waste very often. They have done extensive training on this topic. The bays or rooms where waste goes need to have proper signage and the waste need to have up-to-date profiles.

A bigger issue is incompatibles at TSDFs. They handle larger volumes of waste and there is a greater potential for adverse events to occur. Many years ago, at the Pratt Whitney East Hartford facility, the TSDF combined waste from various CT facilities. They pumped the contents of waste tankers into a piping system to several storage tanks located in vaults. The materials in the tanks were incompatible and could accidentally be comingled if the wrong piping connections were made. When this was pointed out to facility personnel, they redesigned a new storage building that improved storage conditions to eliminate the risk of incompatible wastes coming in contact.

New Hampshire DES

DES presented slides that showed the result of incompatible waste being stored together with a resulting explosion. Two people were med flighted from the scene and two taken to a local hospital. The pictures showed the devastation from the explosion. This was a case involving nitric acid and isopropyl alcohol in a manufacturing setting. The manufacturing process used 40% nitric acid. A chemist worked on a process that involved placing the nitric acid in a tank with a concentration of about 67 percent. They asked the hazardous waste coordinator to remove the nitric acid and put it in a drum for shipment so that they can make a new batch of the material. The coordinator was not able to do this and the 2nd shift had to step in. They grabbed a drum that had some nitric acid and some isopropyl alcohol, and when they added the concentrated nitric acid, the drum exploded. The drum was mislabeled, which contributed to the confusion. It created a fire ball that rapidly spread and went over a partition and injured the employees. They spill response team responded. Windows were blown out. It took two weeks to cleanup the mess and get the facility operating again. The facility was manufacturing ball bearings and using a new passivating process for a client. They have since stopped doing that process.

DES did a CEI at the facility and referred them to the State Attorney General for failure to prevent and explosion and harm to the environment and staff. They were cited for improvement management of HW. There paid a \$150,000 penalty with \$145,000 in cash and a \$5,000 Supplemental Environmental Project (contributing to the local fire department for response equipment).

NH most often sees situations of incompatible wastes being stored improperly in school laboratories and other labs. In many of these situations, the materials and waste are stored alphabetical by name, which runs the risk of incompatibles being close to each other. Some incompatibles are easy – acids and bases, organics, and acids.

NH staff use the Code of Federal Regulation to help look up categories. They also Google Safety Data Sheets which outline incompatible materials. There is a chemical desk reference that is also helpful.

New Jersey DEP

DEP recently saw some similar situations. There was a facility with a nitric acid tank and they had an empty drum that had stored alcohol that was not rinsed. The residue of the alcohol reacted with the acid causing an explosion. The bottom of the drum shot out and everything spilled. It hit the tank holding the nitric acid bath. In another case, there was water and nitric acid sitting on a rack and a drum because over pressurized and shot off, which knocked down some shelves, which cause more spills.

In general, they do not see a lot of these cases.

They refer to the DOT segregation chart / list during inspections.

They did an inspection of a university for two days involving six people. During the third day they compiled notes and reviewed the inventories. While going through the notes, they looked for possible issues with incompatible wastes.

In a NJ case, a research and development company was making carbon hip and knee replacement devises and treating the metal with a nitric acid bath. They had a nitric acid bath. They did their testing outside. It was considered a risky operation.

New York State DEC

They do not have any specific cases to share but they cover the topic of proper storage and handling of incompatible wastes in their October 2020 training for inspectors. They provided training on what inspectors should look for. A few things include oxidizers and reducers are a bad combination. Salts are incompatible with acids and strong bases. Need to keep an eye on these situations. Also look for anhydrous alkali and water. Anything with an “ide” suffix should be looked out for. There is a chart that is complex and challenging to interpret. They will share the slides that they used in the 2020 training. They do annual training (now virtual) for inspectors and this has been part of it in the past.

DEC Region 4 uses a Fischer Scientific compatibility chart as a reference. They had one large generator that has been storing acids, bases, and organics in two buildings. The buildings were open to the air and had ventilation.

Most facilities have two separate storage areas for incompatible materials to minimize the risk from a leak causing a problem.

Massachusetts DEP

DEP staff inspected a company that had containers with potential incompatibles, also chemicals that ended in “ite” – sodium nitrite for example. The roof was leaking in one of the facilities and the label said the material was incompatible with water. The facility was trying to hide the compromised container behind other containers and the inspectors spotted the problem. They found it by “nosing” around and asking questions. The case resulted in a \$40,000 penalty.

In another situation, a facility that handled specialty chemicals that should not be exposed to the air had a series of mini-explosions. This was in Devens, MA.

There was a case in Newburyport, MA that involved failure to conduct proper operator training related to waste compatibility. They opened a reactor during a critical state and created a problem.

They refer to the LQG status Federal Regulations and a table in the rules. They take the table in the field as a reference. The table does not cover mildly incompatible materials.

Massachusetts has not done inspector training on this topic and would be interested in a more formal training session on it, perhaps modeled on what NY has offered.

Follow-Up

NEWMOA staff will ask the HW Training Workgroup to offer some formal training on waste compatibility issues in the future.