



Shipboard Hazmat Use Training for Technicians and Scientists

Scripps Institution of Oceanography
University of California, San Diego

Goals

- To review new UCSD hazmat policies proposed for SIO research vessels.
- Changes include requirements for documentation of training, personal protective equipment, and SOP's.
- Hazmat use application in development, to be filed by science parties to document the above.
- Discuss DOT Materials of Trade exception for self-transport of hazmats by researchers.

Relevant Sections of RVSS

9.4 REQUIRED STANDARD UNDER RVSS

TRANSPORTATION AND DISPOSAL: The Chief Scientist will be responsible for the proper transportation, shipping and disposal of hazardous materials and waste, including the empty containers, associated with their project. Transportation and disposal must be carried out in accordance with Federal, State and Local regulations. In no case will this responsibility be passed to the ship's crew or operating institution. Each Institution's Shipping Department can provide up-to-date information about regulatory requirements.

RESPONSIBILITY: Proper storage, labeling, and spill response (clean-up) is the responsibility of the user. Anyone using hazardous material should be trained in proper laboratory safety procedures. The Chief Scientist shall be responsible for ensuring that safe laboratory procedures are followed including use of personal protective equipment, prohibiting the consumption of food and drinks in labs, and other safety precautions as outlined on MSDS and considered standard laboratory procedures.

9.6 RECOMMENDATIONS AND BEST PRACTICES

CHECK VESSEL REQUIREMENTS: Individual ship operators may have additional (and more stringent) policies regarding the handling, storage and use of hazardous materials. Users should contact the ship operator as early as possible in the cruise planning process to ensure they comply with the vessel requirements.

Why the changes?

Background

- On December 29, 2008, UC Los Angeles research associate Sheharbano (Sheri) Sangji was in the process of transferring a highly flammable chemical agent (*tert*-butyllithium, a pyrophoric chemical that ignites when exposed to the atmosphere). While conducting the transfer, the pyrophoric agent spilled onto her hands, arms, and torso and ignited. Ms. Sangji was not wearing a laboratory coat and suffered burns. She died from injuries on January 16, 2009.

UC Regents Agreement

- The Los Angeles District Attorney filed a complaint alleging 3 felony violations against the Regents of the University of California ("UC Regents"). On July 27, 2012 the UC Regents signed a Prosecution Enforcement Agreement accepting responsibility.
- The terms of the settlement apply to every hazmat laboratory and shop in the UC system.

Agreement requirements

- Title 8 of the California Code of Regulations applies systemwide to all laboratory operations. The Regents' settlement with Los Angeles adds enhanced requirements.
- Cooperation of all PI's and lab personnel is vital to successfully implement the Agreement requirements. The most significant requirements are:
- Training – Completion of lab safety training by all laboratory personnel
- Standard Operating Procedures (SOPs) – Implementation of approved SOPs/Hazard Control Plans for specific chemicals identified in the settlement.
- Personal Protective Equipment (PPE) – Review of hazards and assignment of appropriate PPE.

How to comply

1) Document all safety training:

- Document all lab safety training for all personnel, including students. Keep training records, readily available for inspectors.

How to comply (cont.)

2) Develop a SOP (Hazard Control Plan) for any hazmat chemical on the U of CA Chemical Classification List.

- Use the generic HCP's on the SOMTS site to develop cruise specific SOP's.
- Ensure HCPs are reviewed by lab personnel.
- Approve your HCPs. Only the PI can approve HCPs.

How to comply (cont.)

3) Perform and document a Hazard Assessment to identify hazards that necessitate the use of personal protective equipment (PPE). Provide and assign PPE to lab personnel based on assessment results.

- Use the Lab Hazard Assessment Tool to identify PPE needs.
- Confirm lab staff receive and are trained to use assigned PPE.
- Ensure PPE is worn by everyone using hazmats.

Materials of Trade

- The US Department of Transportation allows exceptions from regulations for non-commercial self-transport of small quantities of hazardous chemicals in the course of business, including university scientific research.
- Does not apply to commercial transport, i.e. FedEx.
- SOMTS researched and received formal training in the exceptions after review of hazmat logistics to TAMT during MarFac pier construction.

MOT requirements

- **This list is not comprehensive!**
- The operator of a motor vehicle that contains a material of trade must be informed of presence of the hazardous material, and of the MOT requirements.
- The aggregate gross weight of all materials of trade on one motor vehicle can not exceed 200 kg (440 lbs).
- Packaging must be either the manufacturer's original package or a package of equal strength.
- Packaging must be leak proof.
- Packages must be marked with a common name (e.g. "spray paint") or a proper shipping name from the DOT HazMat Table (e.g. "ethanol"). Letters RQ must be included for Reportable Quantities of hazardous substances.
- Packages must be closed, secured against movement and protected against damage.

Package Quantity Limits

- Packages are subject to quantity limits under the MOT exception.
- Limits are determined by the hazmat Hazard Class.
- For example, lithium metal and ion batteries are DOT Class 9.
- Under the MOT, Class 9 packages have a 66 lbs/30 kg limit.
- Thus, 66 lbs of lithium metal batteries per package can be self-transported, with a vehicle limit of 440 lbs/200 kg .
- Consult with a trained professional for package limits.

Hazardous materials used as refrigerant for specimens

- Cryogenic liquids must be in a container marked as such (e.g. “Liquid Nitrogen”). To qualify as MOT, cryogenic liquids must be transported in Dewar flasks, insulated cylinders, insulated portable tanks, insulated cargo tanks or insulated tank cars that are designed and constructed so that the pressure in such packaging will not exceed 25.3 psig under ambient conditions during transportation.
- Dry ice, when transported over the roadway, is not subject to the regulations; however, the container must be designed and constructed to permit the release of carbon dioxide gas in order to prevent a buildup of pressure. The package must be marked, “Carbon dioxide, solid,” or “Dry ice.”

Refrigerants (cont.)

- If refrigerant is required for the shipment then:
- Materials must be labeled as either dry ice or liquid nitrogen and the operator must have knowledge of the materials that are being transported.
- Materials must not be transported in the vehicle passenger area.

Responsibilities

- Carriers must know the following:
- General knowledge of MOT regulations
- Quantity limitations
- Packaging requirements
- Marking and labeling requirements
- There must also be a spill kit in each vehicle suitable for cleaning up materials being transported. The kit should include proper protective equipment, absorbent materials, and bags to contain debris.

Responsibilities (cont.)

- MOT regulation does not require:
- Shipping papers (shipper's declaration)
- Emergency response information
- Placarding
- Formal training or retention of training records.

Responsibilities (cont.)

- Hazardous materials must never be transported using public transportation.
- Due to potential liability issues, use of a university owned vehicle is recommended. Any employee choosing to use a personal vehicle is encouraged to discuss coverage scenarios with their insurance carrier.

In Conclusion...

- Hazmat use applications should be submitted 30 days in advance to SIO.
- MOT exception is available for self-transport, with a few caveats. Consult with a trained hazmat professional.
- Your health and safety comes first.