Lithium Battery Shipping Requirements: Mark S. Koch (FTN Associates) Arkansas Environmental Federal Convention Virtual Presentation

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Mark S. Koch undertook a virtual presentation at the Arkansas Environmental Federation Convention titled:

Lithium Battery Shipping Requirements ("Presentation")

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The term "lithium battery" denotes a family of batteries that have different chemistries. They are generally separated into two types of battery for hazardous material purposes which include:

- Lithium metal
- Lithium-ion

Lithium batteries are generally the preferred power source for a variety of consumer and portable electronic devices.

Lithium batteries are regulated as a hazardous material under the United States Department of Transportation's ("DOT") Hazardous Materials Regulations. See 49 C.F.R. Parts 171-180. The Hazardous Materials Regulations apply to any material DOT determines can pose an unreasonable risk to health, safety and property when transported in commerce. As a result, lithium batteries must conform to all applicable Hazardous Material Regulations requirement when offered for transportation or transported by air, highway, rail, or water.

Mark's *Presentation* identified the following causes for concern in addressing lithium batteries:

- Used in various electronic devices and, therefore, are prevalent
- The two types – Lithium Metal and Lithium Ion
- Portable electronics we have would not exist without energy-dense, lithium-based batteries
- While most lithium batteries are safe, some have overheated and caught fire
- Constructed in layers
- Puncturing layers and exposure to air may cause reactions resulting in thermal runaway and fires
- Counterfeit and no-brand lithium batteries may not have been safety-tested

Mark also notes:

- Important to verify the batteries planned for shipment have been safety-tested
- Reference to the UN Manual Tests for lithium batteries
- Batteries that have not passed safety testing, Low-production and prototype batteries have specific requirements for shipping found in 49 CFR Part 173.185
- Different regulations apply depending on mode of shipping

Shipping considerations identified include:

- Lithium batteries are regulated based on the rated watt-hours for lithium ion batteries or the weight of the lithium contained in the batteries for lithium metal batteries (See M/SDS sheet)
- Certain types of battery shipments are prohibited or may require special arrangements
- Small and medium-sized lithium cells can be shipped as partially regulated in the 48 contiguous states by highway or rail if stricter packaging and marking requirements are met

The *Presentation* included a more detailed discussion of the small and medium size exceptions.

In terms of shipping considerations, major risks identified included:

- Short-circuit of the battery as a result of the battery terminals coming into contact with other batteries, metal objects, or conductive surfaces
- Puncture or damage to cells
- Handling mark must include the appropriate UN Identification number
- Special marking for medium-sized lithium batteries (detailed in the slide Presentation)

The *Presentation* included a detailed discussion of the small and medium lithium ion batteries and FedEx ground shipping in the 48 contiguous states.

The “major regulations” identified as potentially applicable to these batteries include:

- IATA – Dangerous Goods Regulations
- ICAO – Technical Instructions for the Safe Transport of Dangerous Goods by Air
- DOT – Hazardous Materials Regulations
- IMDG – Dangerous Goods Code

Recommendations identified by Mark include:

- When shipping, know your equipment
- Lithium Ion or Lithium Metal
- Enclosed or Separate
- Battery Size -Determines which rules/exemptions apply
- Seek training
- Lots of good haz mat shipping training our there both online and in person
- Contact your shipping company
- They have resources to help

A copy of the slides can be downloaded here.