



# **Reverse Logistics and Battery Management**

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# PRBA – The Rechargeable Battery Association

- Members include cell and battery manufacturers, power tool manufacturers, electronic equipment manufacturers, medical device manufacturers, automobile manufacturers, retailers, testing labs, battery recyclers, airlines
- Focus on regulatory, legislative and policy issues at state, national and international level
- International transportation forums
  - UN Sub-Committee of Experts / ICAO Dangerous Goods Panel
  - IMO Sub-Committee on Dangerous Goods, Solid Cargoes and Containers
- Coordinate work with Battery Association of Japan, RECHARGE and Korea Battery Industry Association

## DOT and “Reverse Logistics”

- Proposed definition from U.S. Department of Transportation (DOT) rulemaking:
  - *The process of moving goods from their final destination for the purpose of capturing value, recall, replacement, proper disposal, or similar reason.*
- DOT’s attempt to provide relief for small quantities of returned products regulated as hazardous materials
- Final rule this year?



# Early Days of U.S. Battery Product Stewardship

- **Early 1990's**, focus on nickel cadmium and small sealed lead acid batteries
  - Florida, Maryland, Iowa, New Jersey, Minnesota, Maine and Vermont adopt battery legislation requiring small rechargeable batteries be managed
  - PRBA establishes pilot battery collection programs
- **1994**, PRBA launches RBRC (Call2Recycle) program to address legislative mandates
- **1995-96**, Passage of Universal Waste Act and Federal “Mercury-Containing and Rechargeable Battery Management Act” streamlined battery collection





# Last Ten Years - U.S. Battery Product Stewardship Legislation

## ■ 2006 – 2015

- California and New York City require retailers to take back rechargeable batteries if they sell them
- California enacts disposal ban
- New York State passes legislation that supersedes NYC; manufacturers must develop, finance and operate extended producer responsibility (EPR) program
- California tries and fails multiple times to pass battery legislation
- Washington and Oregon try and fail to pass rechargeable battery legislation
- Minnesota tries and fails to enact primary battery legislation
- **Vermont becomes first state to pass primary battery legislation, effective January 1, 2016**
- Texas and Connecticut try and fail to pass all-battery legislation

## ■ 2016 – 2020

- **All-battery legislation in certain states is inevitable**





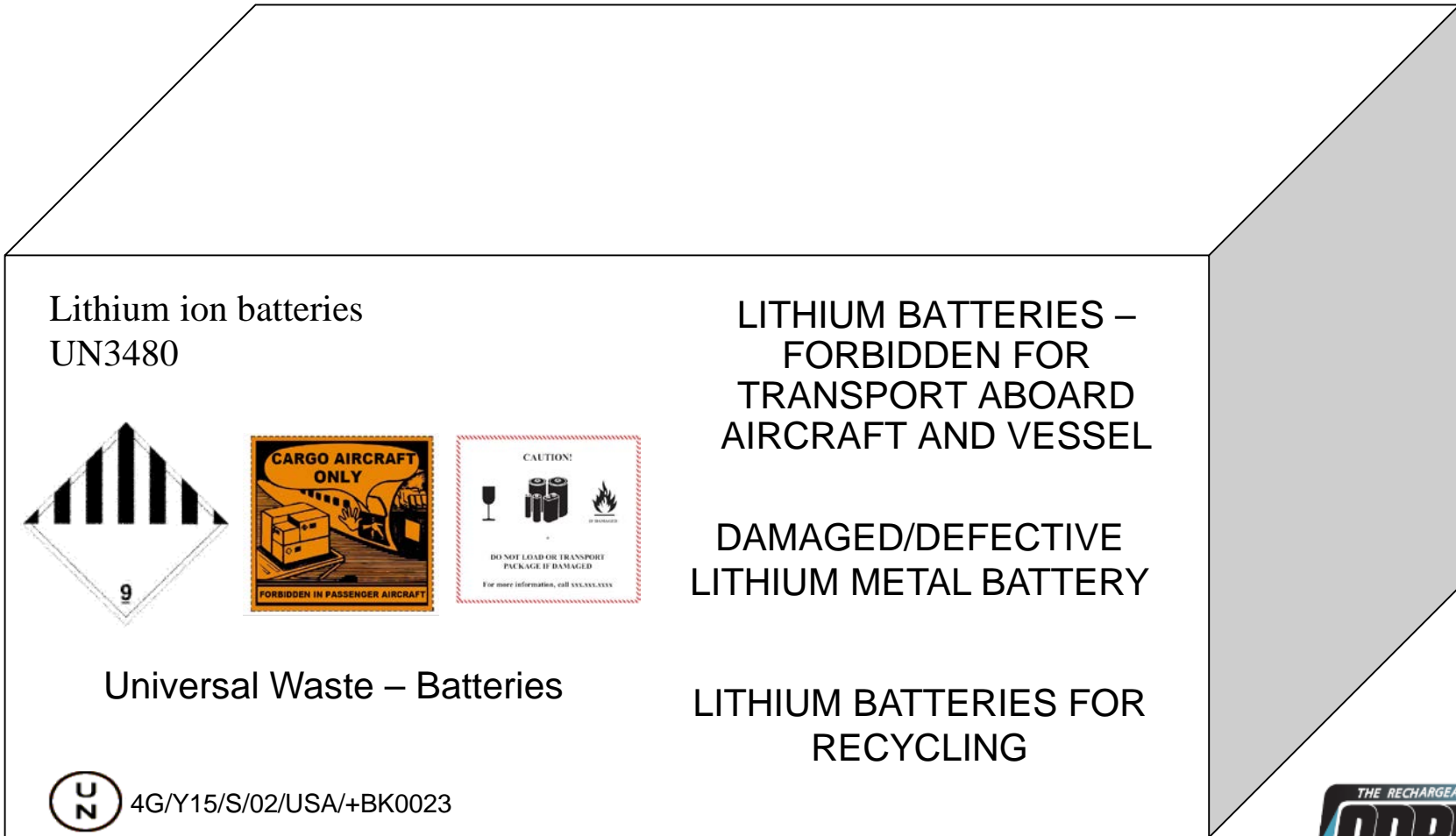
# Lithium ion Batteries to the Rescue (Sort of)

- No heavy metals (*e.g.*, lead, cadmium, mercury)
- Light weight, high energy
- Replacing nonspillable (*e.g.*, VRLA) in various applications
- 1990's, U.S. DOT and international transport regulators take notice, adopt new transport regulations
- The rest is history –
  - Complex, ever-changing U.S. DOT and international hazardous materials (dangerous goods) regulations
  - Uncertainty over whether hazardous waste regulations apply

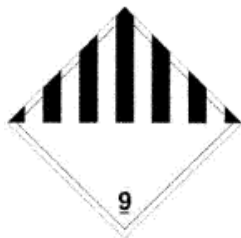
# Four Core Issues with Lithium Batteries

1. Do exceptions for “small” (*e.g.*,  $\leq 100$  Watt hours) and “medium” (*e.g.*,  $\leq 300$  Watt hours) batteries found at 49 CFR 173.185(c) of U.S. hazardous materials regulations apply?
2. Are batteries being shipped for disposal or recycling, refurbish, repair, resale?
3. Are batteries damaged or defective?
4. Have batteries been tested in accordance with the UN Manual of Tests and Criteria?

# Lithium Battery Labels and Markings



Lithium ion batteries  
UN3480




LITHIUM BATTERIES –  
FORBIDDEN FOR  
TRANSPORT ABOARD  
AIRCRAFT AND VESSEL

DAMAGED/DEFECTIVE  
LITHIUM METAL BATTERY

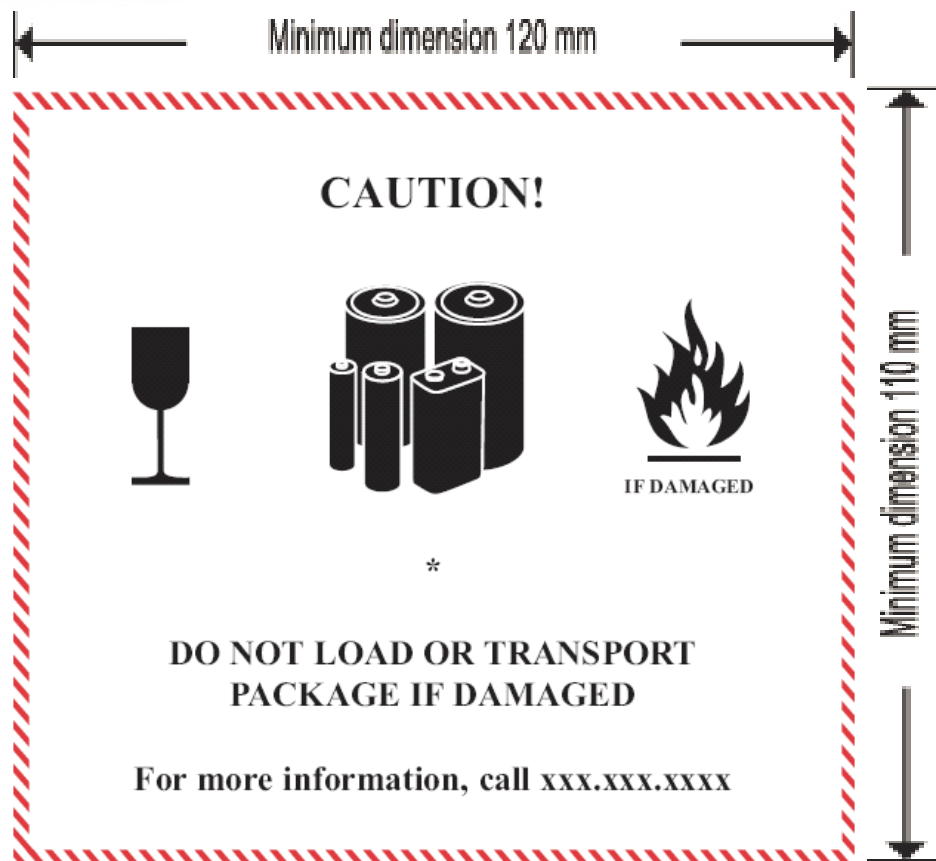
Universal Waste – Batteries

LITHIUM BATTERIES FOR  
RECYCLING

 4G/Y15/S/02/USA/+BK0023



# Lithium Battery *Handling Marking* for Air Transport\* – 49 CFR 173.185(c)(4)(i)(A)



- Dimensions: 120 x 110 mm (4.7 inches x 4.3 inches)
- **105 x 74 mm (4.1 x 2.9 inches) authorized if package cannot accommodate larger marking**
- Border color: Red on a contrasting background
- Pictogram colors: Glass, batteries, and flame must be black
- \* Place for “Lithium metal battery” or “Lithium ion battery”

\* Can also be used to comply with 49 CFR highway, rail and vessel shipping requirements and IMDG Code

# New Lithium Battery Handling Marking for All Modes

- Will appear in 2017 – 2018 dangerous goods regulations
- Expect U.S. DOT to harmonize in 2017 – 2018
- Current lithium battery handling **marking** may be used until December 31, 2018



\* Place for UN Number(s)

\*\* Place for telephone number for additional information

# Waste Lithium Batteries

- Special Provision 130 in U.S. haz mat regulations prohibit mixing of certain battery chemistries (unique to U.S.)
  - Test data from Call2Recycle and PRBA prove no unique safety issues associated with mixing battery chemistries in same package
- Three choices for shipping waste lithium batteries
  - 49 CFR 173.185(b) – Fully regulated
  - 49 CFR 173.185(c) – Exceptions (packages limited to 30 kg unless batteries are packed with or contained in equipment)
  - 49 CFR 173.185(d) – Fully regulated
- “Large format” lithium ion batteries over 12 kg provided significant packaging relief if battery case is “impact resistant”

# Special Permits Issued by U.S. DOT for Transporting Small, Waste Batteries

- Call2Recycle
  - Authorizes mixing of battery chemistries in same package
  - Short circuit protection not required for dry cell batteries up to 9V and alkaline batteries up to 12V
  - Short circuit protection required for all lithium batteries
  - Batteries up to 5 kg except nonspillable lead batteries up to 25 kg
  - Alternative hazard package markings
  - Packages up to 30 kg
  - Excepted shipments (not fully-regulated, Class 9)
- Battery Solutions
  - Special Permit similar to Call2Recycle

# Special Permits Issued by U.S. DOT to Amazon, Snap-On Tools and Best Buy

- Provides relief from U.S. DOT lithium battery regulations for “closed loop” logistics operations
- Limited labeling for packages of lithium ion batteries (and equipment) in overpacks
- Similar Special Permits pending at U.S. DOT for large retailers, manufacturers and distributors

# Damaged/Defective or Recalled Lithium Batteries

- Unfortunately, not an infrequent occurrence
- What does damaged or defective really mean?
- U.S. DOT regulations require special handling, shipping (49 CFR 173.185(f))
- No longer “excepted” from regulations; fully-regulated haz mat shipments
- Challenging issue for retailers and reverse logistics generally



# PRBA Comments on U.S. DOT Reverse Logistics Rule

- Haz mat regulations fail to address unique situations of shipping recalled, damaged or defective lithium batteries and products containing them
- 49 CFR § 173.157 – Proposed exceptions for reverse logistics
  - Should include exceptions for “small” lithium cells and batteries and equipment packed with or containing them
  - Relief for recalled or damaged/defective lithium batteries and equipment packed with or containing

# “Large Format” Lithium ion Batteries

- Electric vehicle, stationary, containerized systems for grid applications
- Always Class 9 haz mat but placarding of vehicles never required
  - No haz mat endorsement on CDL required
- Pallets authorized for batteries over 12 kg with impact resistant outer casing
- Damaged/defective lithium ion batteries increases complexity
  - Closed loop system? Consider U.S. DOT Special Permit



## In Conclusion ...

- Get to know your lithium battery vendors
- Work with product stewardship companies/organization (*e.g.*, Call2Recycle)
- Alert employees to “damaged/defective” lithium battery concerns
- Lithium battery haz mat awareness training for employees (not a full haz mat training program)
- Talk to DOT, consider Special Permit
- Join PRBA!



# QUESTIONS??

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