Water immersion test

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Battery Pack Liquid Exposure

- Batteries can be subject to liquid exposure due to a variety of conditions
  - Regulatory requirements
  - Typical vehicle usage
  - Extreme storms and floods

Liquid Compatibility Considerations

- Types of events
  - Short term considerations
    - Immediate short circuit
    - Electrolysis
  - Long term considerations
    - Corrosion
    - Dendritic growth

- Compatibility of pack internal electrical components with liquids
  - Sealing
  - Location / spacing
  - Current interruption

Key Messages

- Test method determination must FOLLOW development of an appropriate objective
- Objective based on actual field exposure considerations, not infrequent anomalies
  - Drive vehicle through water
    - Depths greater than 300 mm not realistic for most vehicles.
    - “According to FEMA, a foot of water will float many vehicles.”
      - FEMA – Federal Emergency Management Administration (U.S. government agency)
      - Source: https://weather.com/safety/floods/news/flash-flooding-vehicle-danger-20140717
  - Complete vehicle flooding possible, but unlikely
    - Vehicle not in use at time
    - Infrequent event

Recommendation

- Retain current water test conditions
- IF FIELD DATA SUPPORTS, consider increase in water depth, up to maximum of 300 mm
- GTR should not include a full battery pack submersion test