Self-Containing Breathing Apparatus (SCBA) Composite Cylinder Service Life Assessment

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Objective

- **Evaluate Integrity of SCBA Composite Cylinders Which Were Close to End of Designed Service Life (EOL);**
- **Evaluate Accuracy and Repeatability Of Modal Acoustic Emission (MAE) in Predicting a Damaged Cylinder During Requalification;**
- **Assess the Risk Associated in Using These SCBA Composite Cylinders For an Additional 15 Years.**

SCBA Composite Cylinder Usage

- 1997 DOT/RSPA Developed Standards for these SCBA Composite Cylinders “DOT-CFFC” Which were Used to Design and Manufacture These Composite Cylinders Under DOT Special Permits;
- SCBA Composite Cylinders have been Used at Municipal Fire Stations and Aircrafts Applications (Boing, Airbus) under DOT Special Permits for over 25 years;
- Similar Type of Composite Cylinder Designs (ISO 11119-2) also been Authorized in DOT 49 CFR and United Nation (UN) Model Regulations.

Testing Methods Applied Under This R&D Project

- **Over 200 SCBA Composite Cylinders Were Randomly Selected from Municipal Fire Stations and Subjected to Following Design Qualification Testing:**
  - **Burst**
  - **Fatigue Cycling**
  - **Drop/Impact**
  - **Chemical**
  - **Fire**

MAE Testing Predicted Each Failure

Completed Testing & Results

- **Burst – 100% Met Design Burst Pressure**
- **Fatigue Cycling – 92% Met Design**
- **Drop/Impact – 100% Met Design**

MAE Testing Predicted Each Failure

Pending Testing

- Chemical Attached
- Fire Testing
- Fatigue Improvement Testing

Notice of Public Rule Making (NPRM)

- **Authorizing Additional Service Life of SCBA Composite Cylinders under certain operating controls and requalification methods.**