



Transient Suppression Devices

November 7, 2002

Georgios Roussos
Seattle ACO
georgios.roussos@faa.gov



Transient Suppression Devices

Purpose

The purpose of Transient Suppression Devices is to prevent unsafe levels of electrical energy from entering the fuel tanks via Fuel Quantity Indication System and other wiring which enters the tanks.



Transient Suppression Devices

History

- **FAA issued two ADs which require FQIS wiring to be shielded and adequately separated from other wires**
- **To achieve wire and circuit separation within the FQIS LRUs required expensive redesign**
- **TSDs were proposed as an alternative method of compliance**



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History cont.

- **FAA published Issue Paper to define intrinsic safety and other requirements for TSDs**
- **TSDs were approved by the FAA as an Alternative Method Of Compliance with the ADs**
- **TSDs are currently evaluated for compliance to SFAR 88 requirements**



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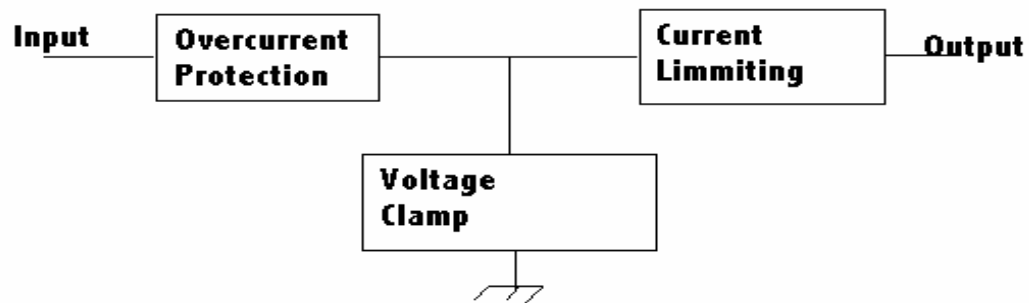
TSD Types

- **Classic TSD**
- **TSD/FQI Combined Unit**
- **FQI/Optical Isolator Unit (Future)**



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Classic TSD Block Diagram (Sample)





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Installation

- **To obtain the maximum benefit, most TSDs are inserted between the airplane wiring connectors and the connectors at the fuel tanks**
- **The Isolated Fuel Quantity Transmitter (IFQT) unit is installed in the body or in the wing spar**



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Installation





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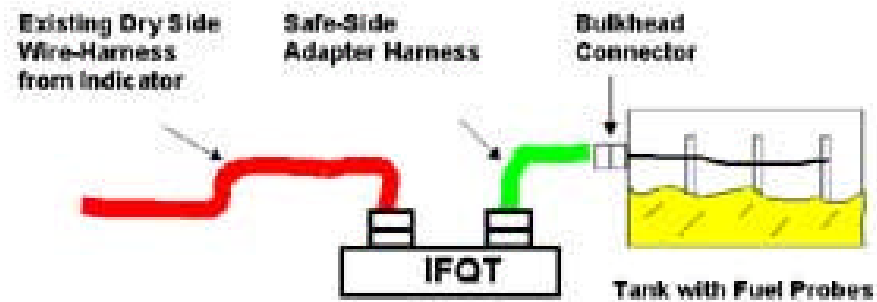
Installation





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Installation





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Installation Requirements

- **Grounding & Bonding**
- **Wire adapter harness separation
(When TSD is not installed at Fuel tank connector)**
- **Proper wire harness installation and routing**
- **Proper wire shielding terminations and grounding**



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Aircraft Testing

- **Fuel System Calibration**
- **Proper System Biasing at low Fuel Quantity**
- **FQI comparison to fueling truck meter and Fuel Tank measuring sticks**
- **Fuel System Functional Testing**
- **Certification Ground and/or Flight Testing**



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Continued Airworthiness

- **Periodic Inspections**
- **Periodic TSD removal and replacement**
- **CMR Considerations**
- **Production Assurance Plans**



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Advantages of TSDs

- **Does not require existing wiring and LRUs to be revised**
- **Is easier and faster to install on in service airplane**
- **In most cases is less costly to install than rewiring the FQI System**
- **Technology can be adapted to most transport airplanes**



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Disadvantages of TSDs

- **Impact on Fuel Quantity Indication Accuracy**
- **Maintainability issues**
- **Classic TSDs not appropriate for newer FQI Systems**
- **Cost**