



Fuel Cell Product Certification / Listing Lessons Learned

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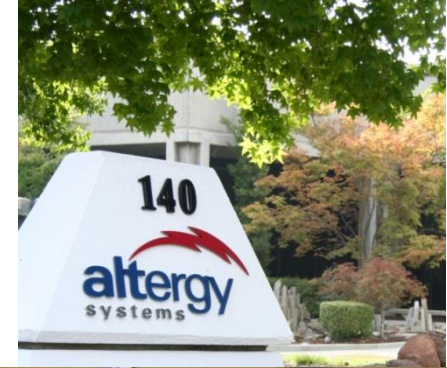
Introduction to Alteryg

- **Who is Alteryg?**

- HQ & manufacturing plant based in Folsom, California
- Recognized by experts as World Class Cutting Edge Technology
- Alteryg designs & manufactures PEM Fuel Cell Power Systems - Branded as **Alteryg Freedom Power™**
- The world's first automated, high-volume fuel cell assembly line

- **Addressing U.S. and International Markets**

- Initial market telecommunications/cell towers backup power market
- Follow-on applications are being evaluated



Altery's Product Offerings

- **Fuel Cell Engine**

- Fully integrated power generator
 - Advanced Altery™ fuel cell
 - Integrated digital electronics and power management
 - Integrated thermal management
 - 5 to 100+kW plug and play capability
- Modular subassemblies
- Lightweight and compact footprint



- **Power cabinets**

- Welded aluminum, all weather enclosure
- House up to two 5kW fuel cell engines and up to two TPMs
- Lightweight and compact footprint

- **Fuel cabinet/tank**

- Welded aluminum, all weather enclosure
- High pressure composite or standard high pressure steel
- Hot swappable or refillable onsite
- Lightweight and compact footprint



- **Transient Power Module (TPM)**

- **Wireless communication/monitoring**



Alteryg's Product Safety

- Alteryg's Fuel Cell products are fully tested, certified, and listed by CSA-America
- The products meets or exceeds the requirements of:
 - The State Fire and Building Codes
 - NFPA 1 – Uniform Fire Code
 - NFPA 55 – Standard for Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
 - NFPA 853 – Standard for the Installation of Stationary Fuel Cell Power Systems
 - NFPA 70 - The National Electric Code (NEC)
 - The International Fire Code (IFC)
 - CSA FC-1 – Standard for Stationary Fuel Cell Power Systems
- Each system is installed through the permitting and zoning requirements of a given jurisdiction



Alteryg's Product Meets or Exceeds all Required Codes and Standards

Alteryg's Certification Process

- Listing requirement driven by customer and AHJ expectations, and code requirements
- Interviewed CSA, UL, TUV, and ERTL
- Decided to work with CSA due to their experience / expertise and cost
- Initially, 4 products were certified and listed
- To date 12 systems have been certified and listed
- It has been a very positive experience
- Ability to sell mass quantities opened as soon as listing was complete.
 - Multiple quarters with MW+ deliveries since listing versus limited quantity evaluation systems prior to listing



Lessons Learned

- The first system is the hardest as you learn the process and what is required
- Bring the listing agency in early to get input before the design is locked
- Assign a certification engineer which obtaining and maintaining product listings is their sole responsibility
- Certify to FCC first ,as changes required may require listing tests to be re-performed
- Do your homework and understand the requirements
- Perform a self-certification assessment to the standards to find deficiencies first
- Self-test before you witness test to ensure you will pass
- Try to build off of listed products to ease additional product listings



Why Require Product Listing?

- The industry is newly emerging and has a low tolerance to safety incidents due to the public perception of hydrogen
 - More public education and awareness is critical to removing this perception
- Listing ensures that the proper engineering has been performed and lowers risk to the community, the buyer, the manufacturer, and the industry
- Allows AHJ review and permitting to be obtained more easily
- Lowers risk
- Currently, not all applications require listing the fuel cell product



Buyer Beware

- Customers need to understand what they are buying
 - Listing parameters versus intended use
 - “Designed in Accordance With”
 - “Certification Pending”
 - “Meets the Requirements of”
 - False statement of product being listed
- Any false listing statements should be reported to the agency they claim to be listed under
 - Not doing so de-values the mark and puts the industry at risk
- Customers should ask for the listing file number or a copy of Declaration of Conformity
- Listings can be confirmed online





Open Session for Questions and Answers