

New Activities Update - UL

Fuel Cells Summit VII

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New Activities Update UL

- ASME – 1/13/03 Workshop Action Plan Items
- UL Standards Under Revision/Development
- Existing Component Standards Contributing To Fuel Cell/Hydrogen Technology

Action Plan Items

- H2 Dispensing w/Multiple Fuels, Single Facility
- IC Engine-Generator Standard w/H2 Fuel
- H2 Detection Standards
- Portable Fuel Cell System Performance

H2 Dispensing w/Multiple Fuels

- Code requirements, including clearance distances
 - ICC
 - NFPA: -30A, -52, -58, -70, -497.
- Related petroleum fuel dispensing requirements
 - UL87, Power-Operated Dispensing Devices for Petroleum Products
 - UL495, Power-Operated Dispensing Devices for LP-Gas
- Integrate with yet-to-be developed requirements for H2 dispensing devices
- Industry interest



IC Engine-Generator Standard w/H2 Fuel

- UL2200, Stationary Engine Generator Assemblies
- NFPA37, -70, -99, -110
- Industry interest

H2 Detection Standards

- UL2075, Gas And Vapor Detectors And Sensors
 - Flammable gas
 - For unclassified locations
- UL1484, Residential Gas Detectors
 - Currently for natural & propane gas
 - For unclassified locations
- Industry interest

Portable Fuel Cell System Performance

- Candidate standards:
 - UL2265, Hand-Held or Hand-Transportable Fuel Cell Power Units with Fuel Containers
 - TC105, WG4, -7, Performance & Portable
 - ASME, PTC50, Fuel Cell Power Systems Performance
 - CSA, FC3, Portable Fuel Cell Power Systems
- For USA coverage, propose ASME, PTC-50

ASME, PTC-50 Scope

- Applies to all fuel cell power systems regardless of the electrical power output, thermal output, fuel cell type, fuel type, or system application.
- It does not address emissions, reliability, safety issues, or endurance.
- Contains methods and procedures for conducting and reporting fuel cell system testing.
- Defines the test boundary for fuel and oxidant input, secondary energy input and net electrical and thermal energy output.
- Provides procedures for determination of electrical efficiency or heat rate and overall thermal effectiveness at rated or any other steady-state condition. The Code also provides the method to correct results from the test to reference conditions.

UL Standards Under Revision/Development

- UL1741, Inverters, Converters, and Controllers for Use in Independent Power Systems
- UL2264, Gaseous Hydrogen Generating Appliances
- UL2265, Hand-Held or Hand-Transportable Fuel Cell Power Units with Fuel Containers

UL1741

- **DOE/NREL Activity To Expand Scope To Harmonize With IEEE1547 and Add Other DG Technologies**
- **Proposals Out For Review**
- **Working With Utilities**

UL2264

- Covers portable, stationary and fixed gaseous hydrogen generating appliances, rated 120V and greater. The requirements are expected to include the water electrolysis method and other chemical process methods for hydrogen generation, dispensing, and reformation.
- Covers equipment that may or may not include storage means integrated within the product.
- Covers Industrial, Commercial, Residential.
- Hydrogen generator standards comparison article:

<http://www.hydrogensafety.info/articles/03-may-02.asp>



UL2265

- Provides DC outputs that do not exceed National Electrical Code (NEC) Class 2 levels (as defined in Table 11B in Article 725 of the NEC).
- Covers factory matched fuel storage containers for these fuel cell power units that may be transported separately.

UL2265

- For use in unclassified (ordinary) locations as defined in the NEC.
- Electrical power sources that include integrated electrical connection means, integrated wiring material leads with or without electrical connectors, or a combination of these arrangements for single or multiple electrical loads.
- Fuels and technologies covered:
 - a) Fuels identified as alcohols, such as methanol, methanol and water, and gaseous hydrogen.
 - b) Proton exchange membrane (PEM) fuel cell stacks and direct methanol fuel cell stacks (DMFC). May or may not include integrated reformers or fuel processing units to derive hydrogen gas from the fuel of choice.

UL Component Standards

- UL252 Compressed Gas Regulators
- UL429 Electrically Operated Valves
- Various Standards For Electrical Equipment For Use In Classified Locations (NEC)
- UL991- Reliability For Electrical Circuitry
- UL1998 – Software Safety
- UL1778 – UPS Equipment
- Numerous Other Electrical Component Standards

