

PEEI Logs Significant Number of Hours of Loaded Operation

As of the end of October, PEEI's fuel cell bundle test has logged over 2000 hours of loaded operation. The bundle is a 6X6 array of 36 tubular Solid Oxide Fuel Cells (SOFCs). This bundle test continues to demonstrate our in-house capability for designing, fabricating, and operating SOFC systems of multiple cells including unattended operation. The information being gathered will be valuable for application to follow-on multiple-bundle stack demonstrations.

To date this bundle test has achieved several significant accomplishments:

- The test demonstrated successful operation of tubular cells in the necessary orientation (open ends down) for commercial Turbo Fuel Cell Engine (TFCE) design. All previous single-cell tests were oriented with open ends up.
- The test demonstrated the high-current power lead design comparable to that of the TFCE. The positive and negative power leads are the same for one bundle as they would be for multiple bundles.
- All of the instrumentation made/implemented



The crew of PEEI's test engineers and technicians. Kneeling: Jason Havash Standing (L-R): Jim Sulkosky, Vince Toth, Bill Evans, Larry Ratkus, Owen Taylor, Mike Albright, Gianfranco Zafred, and Mick Zaharoff.

in-house worked well and has provided useful data for follow-on design work. This included demonstration of the value of PEEI-developed sensors

incorporated into each cell as a means for diagnostics and control.

- The test provides useful

(Cont'd. on Page 14)

Mike Pelar Plumbing
Offering: New & Repair Work, Electric Eel Service,
Bathroom Remodeling, Water Heater Installation,
Boiler Service & Installation, Water, Sewer &
Gas Line Installation & Repair,
RADIANT HEATING SYSTEMS
208 Leachman Road, P. O. Box 175, Whitney, PA 15693
724.423.1057 — PA#041096

LEN'S
JEWELRY REPAIR
330 Main Street, Latrobe
724-532-1990
• *Expert Jewelry Repairs*
• *Engraving*



Loyalhanna Care Center

535 McFarland Road
Latrobe, PA 15650
724.537.5500
Fax: 724.537.0155

LOYALHANNA
CARE
CENTER

Skilled Nursing
Long Term Care
Short Term Rehabilitation
Respite Stays
Hospice Services

Call 724.537.5500 today
for a tour and free,
no obligation consultation.
*Loyalhanna Care Center
providing peace of mind
and continuity of care*



BUILDERS

724.537.3495

PA #000362

- New Homes
 - Room Additions
 - Post Frame Buildings
 - Steel Buildings
 - Siding • Windows
 - Warranties
 - Residential & Commercial Roofing
 - EPDM Rubber & Standing Seam Roofs
- FREE ESTIMATES
Quality Work & Materials

Ferguson Law Associates

Richmond H. Ferguson
Michael D. Ferguson
Terrance D. Ferguson
Pamela H. Ferguson
Jason N. Huska

Attorneys At Law Concentrating in:

Auto Accidents
Wrongful Death
Wills & Estates
Personal Injury
Criminal Law
Real Estate
Family Law

Workers Compensation

www.fergusonlawassociates.com

724.537.7671

400 Main Street ~ Latrobe

PEEI...

(Cont'd, from Page 11)

experience in the development of controlled leakage seals that are fundamental to high-temperature fuel cell engines; this could be viewed as a similar accomplishment to the successful development of piston rings that seal the combustion chamber from the crankcase along the sliding interface between the piston and cylinder in the internal combustion engine. In the TFCE, instead of sealing relative moving different parts, the sealing is between relative moving process gases. PEEI's bundle test demonstrates a major advancement in the development of these controlled leakage seals between relative moving different process gases.

- During start-up, there seemed to be an overwhelming number of safeguards, different checks to be made, and parameters to be monitored. This would be typical of any new technology during development and initial demonstration. A large number of similar aspects occur in our automotive engines. However, PEEI doesn't normally see them because they are handled by onboard computers or built into control logic.

Thus far the bundle test has endured several unscheduled partial shut-downs resulting from support system problems including computer control/software glitches and support component failure. Each of these problems has proven to be a valuable learning experience. None of these problems can be attributed directly to the bundle.

PEEI is currently working on the design of a three-bundle "stack" that will demonstrate

structures like those in a large TFCE. At present, there are two main areas of focus:

- Cell processing where we are refining the production of the tubular air electrode in combination with Xylon Ceramics, Alfred, NY.

- Air-combust-recirc (ACR) box for the TFCE is comparable to the "engine block" in the IC engine. For the bundle test, the ACR box was made out of many individual ceramic pieces that were cemented and sintered (fused) together to demonstrate the concept. In the three-bundle stack, the ACR box will be made as a single piece from the beginning to demonstrate high-volume, low-cost manufacturing. The ACR box is what will make the TFCE commercially cost effective.

- A photograph of the bundle test along with PEEI employees who have worked to make the bundle test successful and are currently working on the three-bundle stack is on Page 13. Funding for this project has been provided primarily by the US Army RDECOM-TARDEC, Warren, MI, with support from the Pennsylvania Department of Environmental Protection, Harrisburg, PA. Local community support has been from the Supervisors and staff of the Mount Pleasant Township, the Mayor, Manager, and Council of the Mount Pleasant Borough, and US Congressman Jack Murtha (and staff) representing Pennsylvania's 12th Congressional District.