

A Power Dense 2 kW Logistics Fueled Solid Oxide Fuel Cell System for Mobile Applications

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Oral Presentation Session HRD41 SOFC - Fuel Cell Industry II








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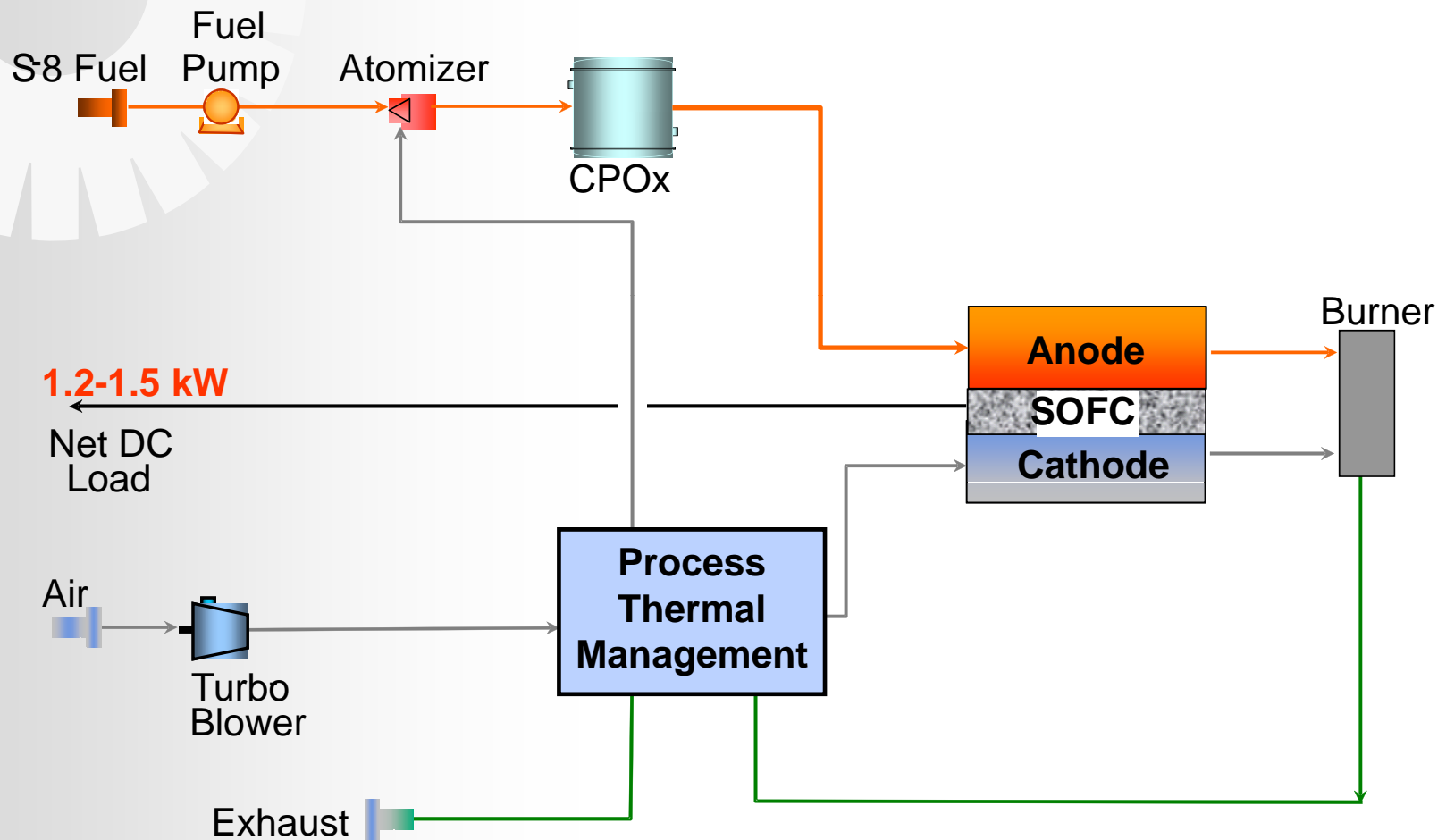
Objectives

- Phase I – Completed
 - S-8 fueled 1.5kW bench top demonstration
- Phase II – Ongoing
 - Flight test

Team

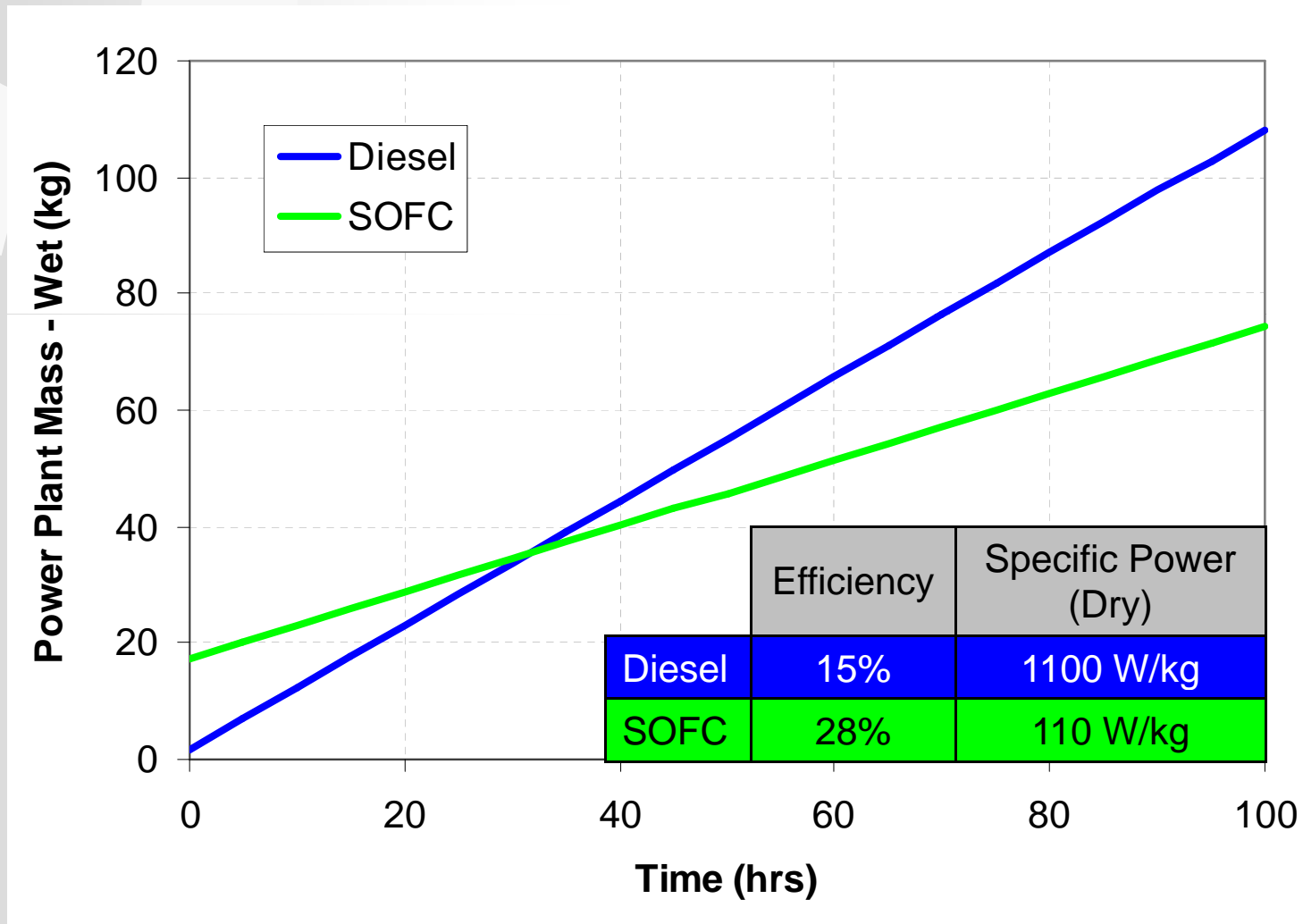
Organization	Role
	Customer
	Customer
	SOFC System Integrator Reformer
	Stack
	Heat Exchanger
	Exhaust Gas Burner
	Cathode Air Blower

System Flow Sheet

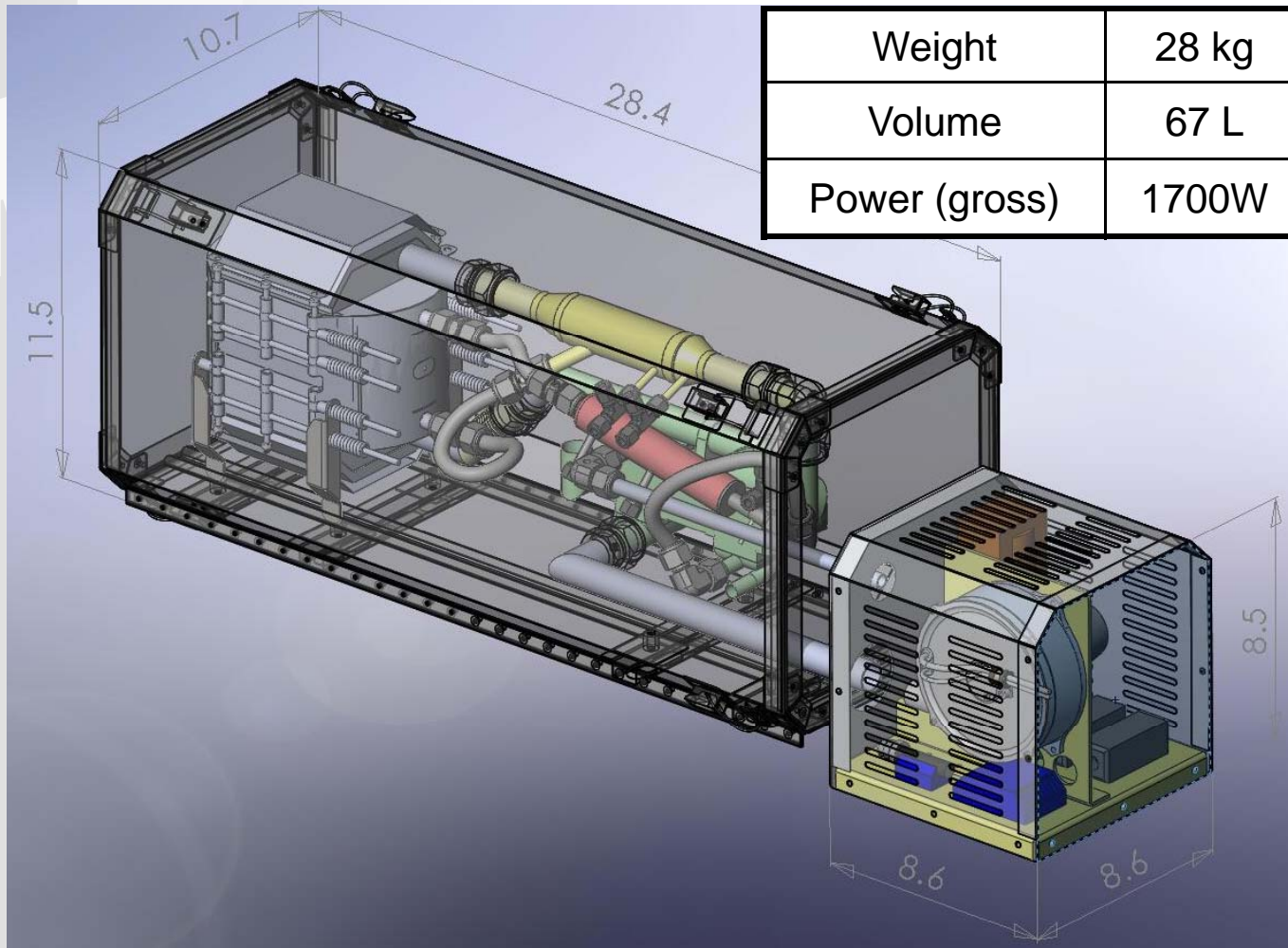


SOFC Flight Value Proposition

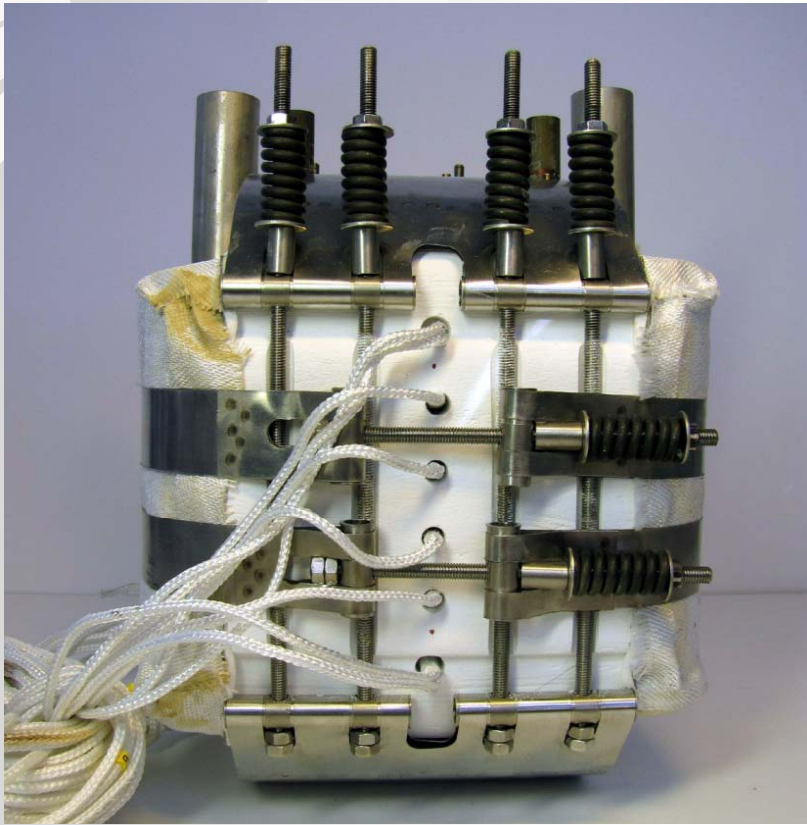
Increased Persistence



S-8 Fueled Bench Top System



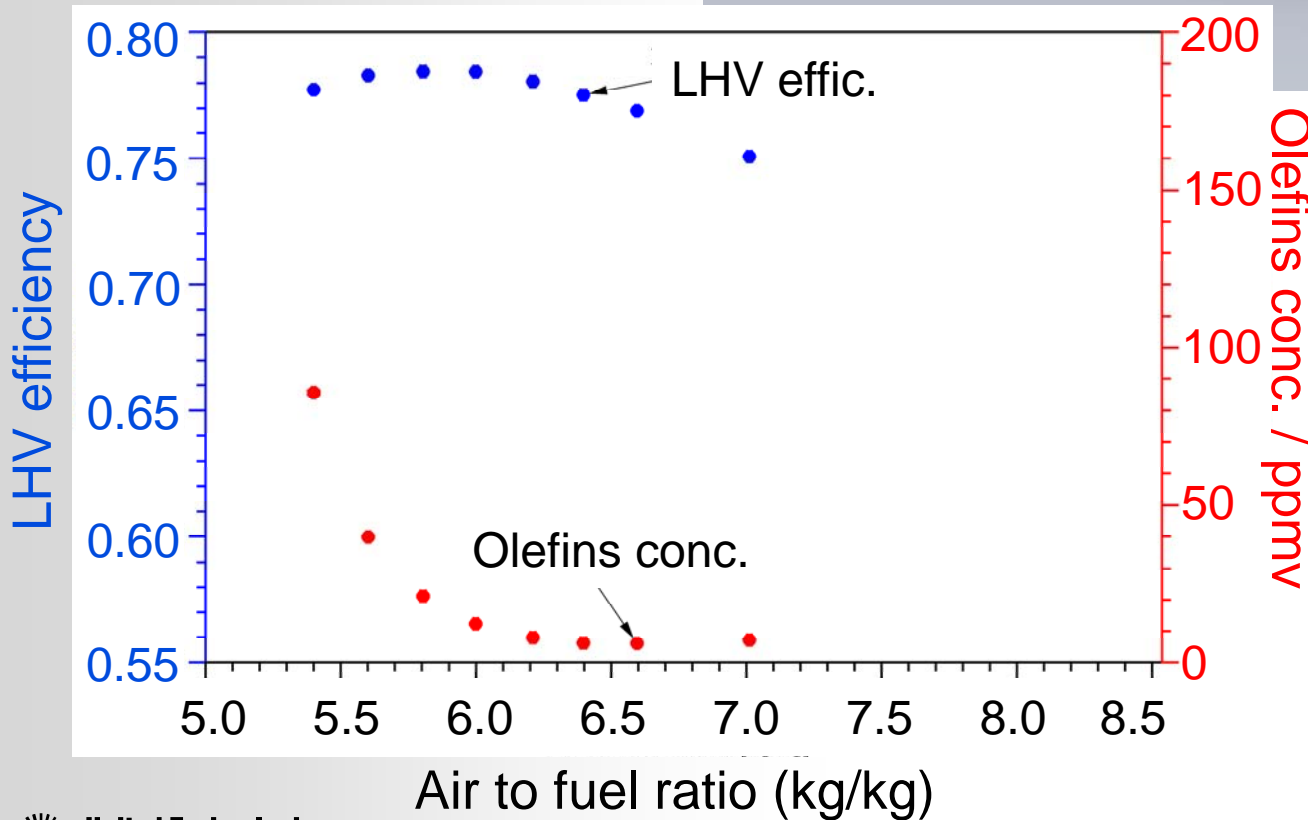
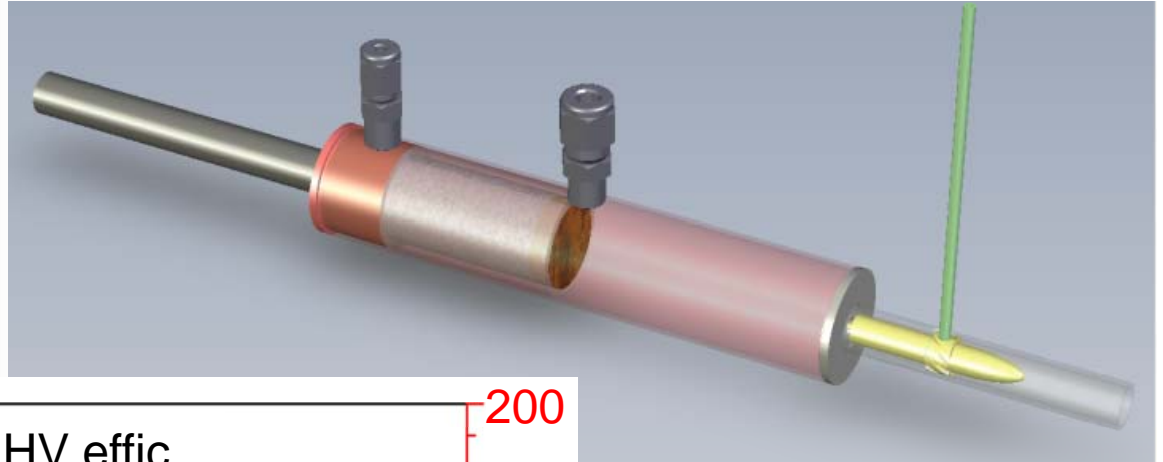
Stack



Features

- 2 kW
- Lightweight (9 kg)
- High Specific Power (>200 W/kg)
- Fully Integrated
 - Stack
 - Insulation
 - Compression System
- Large ΔT (>200 °C)

CPOx Reformer



Features

- Compact & lightweight
- Low pressure drop
- Life >300 hr (so far)
- Up to 79% efficiency
- 50% turndown (from nominal, not max.)

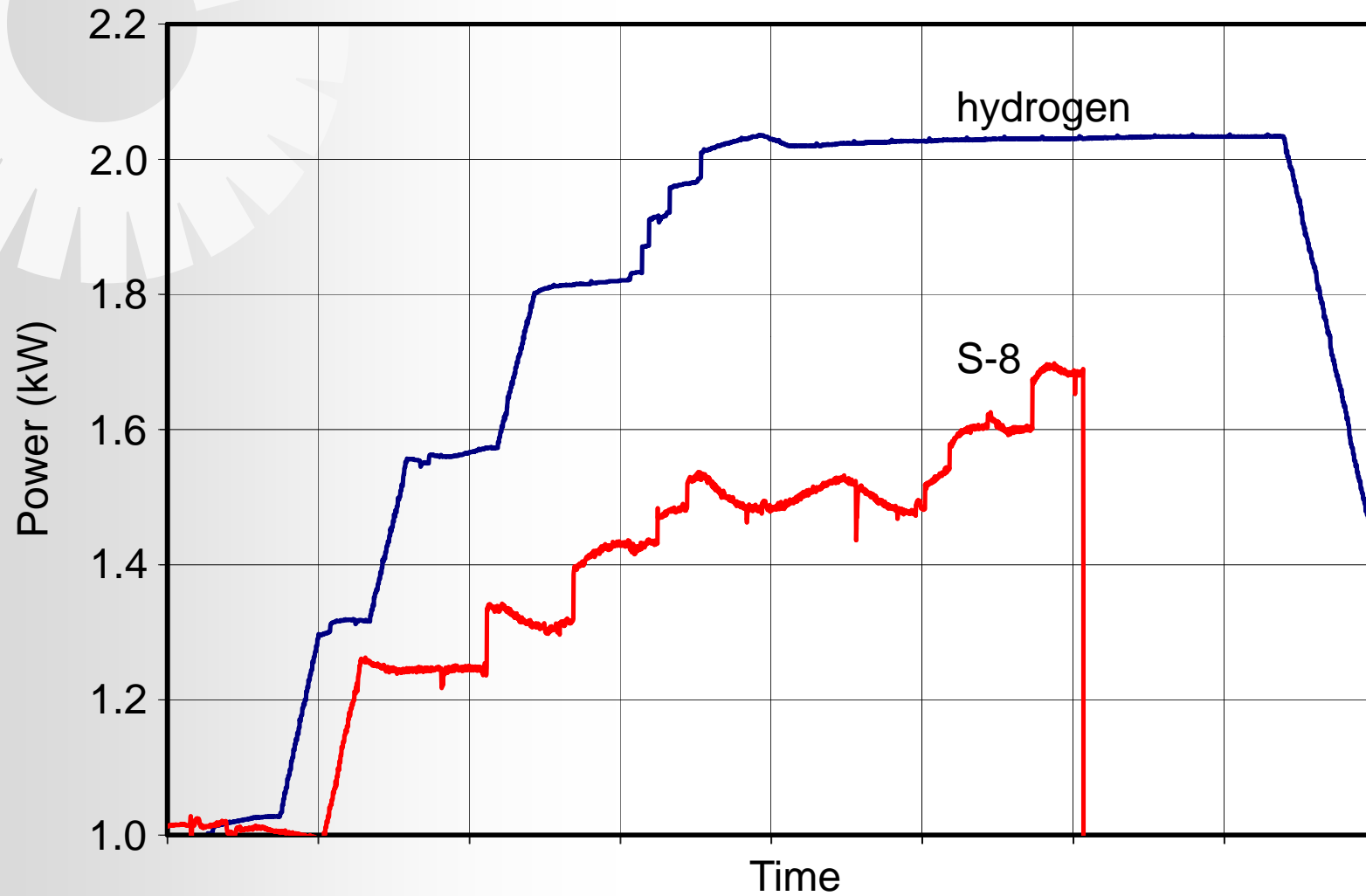
High Temperature Heat Exchanger

Features

- High temperature (>900 °C)
- Compact & lightweight
 - 4 streams (3 used)
- Chromium-free oxide
- Effectiveness > 70%



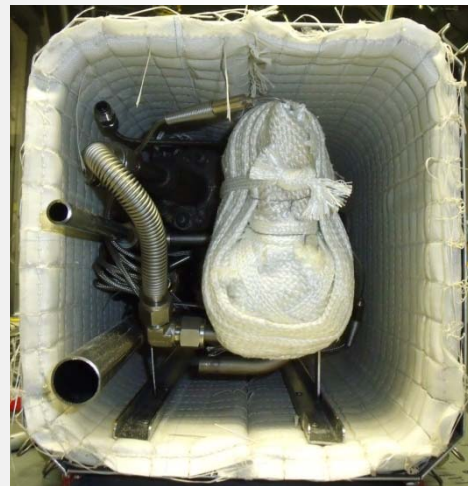
Phase I Bench Top Unit Gross Power versus Time



Phase I Bench Top Unit – Shipped to TARDEC



Hex End View



Stack End View



Next Steps

- Flight weight, volume & power bench top unit
- Autonomous control system
 - Push button start/stop
 - Load following
- Flight test