MINIMUM REQUIREMENTS			
	PHASE I	PHASE II	PHASE III
POWER RATING (NET)	3kW - 10 kW	3kW - 10 kW	3kW - 10 kW
COST	$800/kW	$600/kW	$400/kW
EFFICIENCY (AC or DC/LHV)	Mobile - 25% Stationary -35%	Mobile - 30% Stationary - 40%	Mobile -30% Stationary - 40%
STEADY STATE TEST @ NORMAL OPERATING CONDITIONS	1500 hours 80% availability Δ Power $\leq$ 2% degradation/500 hours at a constant stack voltage with R $\geq$ 0.95. R-Linear Correlation Coefficient	1500 hours 85% availability Δ Power $\leq$ 1% degradation/500 hours at a constant stack voltage with R $\geq$ 0.95. R-Linear Correlation Coefficient	1500 hours 95% availability Δ Power $\leq$ 0.1% degradation/500 hours at a constant stack voltage with R $\geq$ 0.95. R-Linear Correlation Coefficient
TRANSIENT TEST	10 cycles Δ Power $\leq$ 1% degradation after 10 cycles at a constant stack voltage.	50 cycles Δ Power $\leq$ 0.5% degradation after 50 cycles at a constant stack voltage.	100 cycles Δ Power $\leq$ 0.1% degradation after 100 cycles at a constant stack voltage.
TEST SEQUENCE	1) Steady State Test -1000 hours 2) Transient Test 3) Steady State Test - 500 hours	1) Steady State Test -1000 hours 2) Transient Test 3) Steady State Test - 500 hours	1) Steady State Test -1000 hours 2) Transient Test 3) Steady State Test - 500 hours
FUEL TYPE	For the complete duration of the Steady State and Transient Tests, operate the Prototype on either a commercial commodity, natural gas, gasoline, or diesel fuel (s) or a representative fuel based on respectively methane, iso-octane, or hexadecane corresponding to the proposed primary application (s). Utilize external or internal primary fuel reformation or oxidation. If multiple applications using different fuels are proposed split the total test time equally among the different fuel types.	For the complete duration of the Steady State and Transient Tests, operate the Prototype on either a commercial commodity natural gas, gasoline, or diesel fuel (s) corresponding to the proposed primary application (s). Utilize external or internal primary fuel reformation or oxidation. If multiple applications using different fuels are proposed split the total test time equally among the different fuel types.	For the complete duration of the Steady State and Transient Tests, operate the Prototype on either a commercial commodity natural gas, gasoline, or diesel fuel (s) corresponding to the proposed primary application (s). Utilize external or internal primary fuel reformation or oxidation. If multiple applications using different fuels are proposed split the total test time equally among the different fuel types.
MAINTENANCE INTERVALS	Design aspects should not require maintenance at intervals more frequent than 1000 operating hours.	Design aspects should not require maintenance at intervals more frequent than 1000 operating hours.	Design aspects should not require maintenance at intervals more frequent than 1000 operating hours.
DESIGN LIFETIME	Not less than 40,000 operating hours for stationary applications and 5,000 hours for transportation applications for military uses.	Not less than 40,000 operating hours for stationary applications and 5,000 hours for transportation applications for military uses.	Not less than 40,000 operating hours for stationary applications and 5,000 hours for transportation applications for military uses.

MINIMUM REQUIREMENTS (Supplement)

1. POWER RATING

The goal is to develop a 3 kW - 10kW solid-oxide fuel system.

2. COST

The cost goals identified in the table shall be met by an independent audited cost estimate that includes the following specified components of the fixed and variable cost of the fuel cell system. The cost estimate must justify the assumed annual production of fuel cell systems per year that support the cost goals of each phase. A fuel cell system is defined in the Solicitation Objectives section. Concurrent with final testing each Industrial Team shall submit a cost estimate of sufficient detail that a ±25% confidence interval could be assigned. Three auditing firms that routinely perform cost estimate work of the type detailed here shall be identified and presented to the DOE for approval of one of the firms to perform the auditing function. The cost of the independent audit shall be included in the scope of work for this project.

The cost estimate shall establish a Factory Cost. Items to include are:

Equipment and Plant Depreciation
Tooling Amortization
Equipment Maintenance
Utilities
Indirect Labor
Cost of Capital
Manufactured Materials
Purchased Materials
Fabrication Labor
Assembly Labor
Indirect Materials

The following costs shall not be included in the cost estimate:

Research and Development
Sales and Marketing
General and Administration
Warranty
Taxes

3. EFFICIENCY

The efficiency values indicated in the goals may be based on both documented calculations and measurements. The efficiency values must be achieved or exceeded at the beginning and end of the test sequence. The efficiency is defined as AC or DC power output of the system divided by the Lower Heating Value (LHV) of the fuel input stream of the system at full rated load at the steady state normal operating condition over a period of at least one hour.

4. STEADY STATE TEST @ NORMAL OPERATING CONDITIONS

The test must be conducted as a prototype with fully independent and self-sustained operation utilizing appropriate load banks to dissipate the energy produced. Test time will be counted only during periods of operational heat-up and cool-down and during the Industrial Team defined Normal Operating Conditions (NOC) corresponding to the proposed applications with DOE approval of the test plan and operating points required. The power stability requirement measurements of power must be made at a constant stack voltage for the entire measurement and all measurements must

be made at the same stack voltage for the duration of the required testing. The variability of fuel cell stack voltage must not exceed a sum of the squares based on the number of cells in the stack and a specified maximum cell variation of 0.02 volts per cell. A remote link shall be established with the NETL site so that test performance can be monitored on a continuous basis. All test data shall be electronically recorded and stored in a retrievable manner. Data should be recorded at a frequency sufficient to resolve significant transient phenomena for NETL review for at least one year after completion of the test. The Government may require at its discretion to have the prototype sent to NETL for further testing following completion of the required Industrial Team testing.

5. TRANSIENT TEST

The test must be conducted as a prototype with fully independent and self-sustained operation utilizing appropriate load banks to dissipate the energy produced. The Industrial Team will identify realistic transients corresponding to the proposed applications with Government approval of the test plan and transients required. All test data shall be electronically recorded and stored in a retrievable manner. Data shall be recorded at a frequency sufficient to resolve significant transient phenomena for NETL review for at least one year. In the event that a modification or repair is required the entire minimum number of cycles for the phase will be repeated.

6. TEST SEQUENCE

See table above.

7. FUEL TYPE

If a non-commercial commodity fuel is used for Phase I it shall contain from 50% to 100% methane, iso-octane, or hexadecane representing natural gas, gasoline, or diesel fuel respectively.

8. MAINTENANCE INTERVALS

The prototype fuel cell system shall not have any design aspect that would require regularly scheduled maintenance at intervals more frequent than 1000 operating hours.

9. DESIGN LIFETIME

The design lifetime of the fuel cell system identified by the applicant shall be consistent with the application (s) and market considerations identified in the application. This lifetime should not be less than 40,000 operating hours for stationary applications and 5,000 hours for transportation applications for civilian or military uses unless justification is provided for other lifetime specifications in the application.