**Request Form for Stirling Engine Senior Design Project  
Dr. Stephen Crown  
July 23, 2015**

* **Project Title:**

**Building & Demonstrating A Half HP Low Temperature Stirling Engine**

* **Is the project CONFIDENTIAL? Yes / No**
* **Pl. identify critical Design Component(s)?**

**Matlab simulation  
Validation of last year’s suggestions  
Explore new ideas  
Modifying existing prototype**

* **Expertize needed to address the design component (pl. circle ALL that apply)**

**Statics, Dynamics, Thermo, Fluids, Controls, K&D, Heat Transfer, Materials, FEA, …..**

**Pl. add anything else you feel needed. Thanks.**

* **Special software expertise needed?**

**Matlab, LabView, Algor, Solidworks, …..**

**Pl. specify if there’s anything else? Thanks.**

* **Is Machine shop expertize needed? Yes / No**
* **Pl. mention MINIMUM Measurable Outcome(s):**

**Validate and implement last year’s suggestions for improvement  
Identify further improvement to build a working prototype**

* **Is there any Key Performance Indicator (KPI) you plan to use to measure progress towards Measurable Outcome?**

**Use of Matlab to analyze past suggestions & develop new ideas  
Modify existing prototype to make it a working prototype.   
Building a working prototype will the an excellent achievement**

**If you’ve a write-up you want to add, pl. do so either as an attachment or type/write below & over. Thanks.**

Unlike an internal combustion engine, which relies on expensive fossil fuels like gasoline or diesel, a Stirling Engine operates on any external heat source such as an open flame or solar energy. Although Stirling engines are machines that operate with high efficiency, they are difficult to build and have limited research pertaining to them. Last year an initial build was completed using appropriate analysis. A series of tests were done to ensure the safety and the appropriate functionality of the product. The tests helped the team identify the best piston ring configuration and allowed the team to simulate the results in MATLAB and determine how the friction and leakage rate affected the power output of the Stirling engine at higher speeds. From this, it was determined that the leakage rate does not play a major role in the operation of a Stirling engine**. Even though the last year’s team was unable to build a working prototype, important improvements on the initial design were suggested by the team. Objective of this year’s team will be to implement those suggestions and build a working prototype.**