PSAS Propulsion Team October 30, 2004

Philosophy:

VALUES

- Make the hybrid motor safe, simple and reliable.
- All aspects of the hybrid motor will be open source. If it's not open source then it will not be part of the PSAS hybrid motor.
- Working to understand the hybrid will help in optimization of the design.
- Have productive attitudes
- To learn from other's mistakes and successes (and of course our own).
- Accept that failures will happen but keep moving ahead.
- Do the research and design but remember the importance of actually building hardware.
- Come to a consensus on important project issues.

DESIGN PRINCIPLES

- Minimize (cost per pound of hardware * total hardware weight)
- If all things are equal, favor simple over complex components. (Minimize part count, manufacturing and assembly time).
- Favor COTS over exotics or 'one-off" parts. (If it saves time, money and the efficiency penalty is not great.)

General Goals:

OVERALL

- Openly develop a LOX/Paraffin hybrid motor for the investigation of active guidance and publish the results.
- Use the LOX/Paraffin hybrid to investigate scaling
- Motor capable of throttling and TVC.
- Motor 15 second burn, 1000-2000 lbf.

TIME LINE

- Develop and static fire a ground based (flight equivalent) LOX/Paraffin hybrid in one years time.
- Design for a flight article LOX/Paraffin hybrid but test with this equipment on a small scale where possible.

- Wait until we have a flight-article LOX/Paraffin hybrid before we start implementing a thrust vector control system.
- Consider the future thrust vector control system while designing the initial flight-article LOX/Paraffin hybrid design.

PROCEDURAL

- Formalize roles, scripting, and operating procedures during testing and other hybrid related operations.
- Create a critical path and task dependencies list. Attach time frames to this where possible.
- Have a designated project manager responsible for calling meetings, assigning tasks, and responsible for bringing consensus if there is conflict.
- Hold regular meetings every 2 weeks.
- Cross train team members.
- Data reduction will be performed by more than a single individual. The results of the reduction will be discussed and a consensus by the group will determine the direction in which to go.
- Take incremental design steps
- Proceed with design phase until consensus is reached then freeze design and move to prototyping phase.
- During prototyping phase adhere to design unless it can be show that something will not work. Under this circumstance a re-evaluation and possible design changes can be made base on consensus of the group.
- Members commit to completion of tasks on time. If that is not possible, members will ask for help or otherwise communicate to the group so that reasonable arrangements can be made.