Review of Power Sub-System at IITB

Date: 26th April, 2008

Time: 11am to 1:30pm

Venue: Casde Conference Room, Aerospace Department Main Building, IIT Bombay

Professors Present:

1. Prof K. Sudhakar, Aerospace Engineering
2. Prof Hemendra Arya, Aerospace Engineering
3. Prof Kishore Chatterjee, Electrical Engineering
4. Prof BG Fernandez, Electrical Engineering

Students Present:

1. Mehul Tikekar, Power Sub-System Head
2. Amaye Damle, Power Sub-System
3. Nikhil Kumar, Power Sub-System
4. Saptarshi Bandyopadhyay, System Engineer and PD
5. Shashank Tamaskar, Controls Sub-System Head and PD

The presentation on the status of the Power Sub-System was given by Head Mehul Tikekar. The issues that were discussed in the meeting are as follows:

1. Special care involved while handling solar panels. Their protection and backing must be looked into.
2. The power graphs of MPPT circuit (namely P1,P2 and P3) should be shown individually over 1 orbit.
3. Redundancy issues of OBC and power microcontroller were discussed.
4. Analog MPPT can be done without much compromise on power loss.

5. 98% efficiency of MPPT circuit shown by the simulation is higher than expected. The expected efficiency should be around 90-93%.
6. The team was asked to decide on the time for which satellite should be operational in case of failure of the circuit on the charging side. This time should arise out of some detailed analysis.
7. Toroidal inductors can be used for reducing magnetic interferences and can be got in Electrical Engineering department.
8. Management of available power should be done by OBC. Whereas, switching off faulty circuit should be done by the Power microcontroller.
9. The efficiency of beacons must be checked. The efficiency value used (~80%) was deemed to be too high.
10. The team was advised to look into the back pressure created by beacon transmission at high wattage. The possibility of a Torque about the satellite due to this transmission must be explored.
11. The team was asked to make a list possible failures of the mission.
12. The team was given some sources for the PIC compiler.
13. Some Testing guidelines were suggested. As the results were to be used in the future also, they should be documented properly. The objectives, procedure, day conditions while doing experiment, readings and results must be stated clearly.
14. The team was suggested to get in touch with TCS, as they did PCB layout with EMI reduction. They were also suggested to talk to Emerson, Pune who made Mechatronics kits.