Review of System Engineer at IITB

Date: 5th April, 2008

Time: 10am 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 PM Mujumdar, Aerospace Engineering

Students Present:

1. Saptarshi Bandyopadhyay, System Engineer and PD
2. Shashank Tamaskar, Controls Sub-System Head and PD
3. Haripriya, Structures Sub-System Head
4. Subhasis, Payload Sub-System
5. Mehul Tikekar, Power Sub-System Head
6. Mallesh B., Controls Sub-System
7. Sushant Sachdeva, Student Advisor

The presentation on the status of the Satellite on a System level was given by System Engineer Saptarshi Bandyopadhyay. The issues that were discussed in the meeting are as follows:

Overall

1. The panel was happy with the amount of work that the team had done.
2. It was strongly commented by the panel that the team should do a realistic assessment of the deadlines.
3. It was recommended that the team must delay the sending of the proposal until they had

answered to all the questions that were raised in the review meeting.

4. The team was also asked to conduct individual reviews.
5. The problem of authenticity/validity of our data was pointed and it was commented that there was no way to validate a lot of our claims since we did not cite any literature.
6. The problem with conducting the review meetings was discussed and its solution was recommended.
7. The team was also asked not to worry about the budget.
8. The problem of a proper working space was also solved and they were given the activity room. They were also permitted to shift a few computers in the department in the activity room.
9. Room retention permissions for the students during the summer of 2008 were also given.
10. It was commented that we did not have a proper place where all the documents that we have generated could be seen.
11. It was commented that all the team leaders were not present for the meeting.

Payload

1. The panel enquired the end users of the TEC data. The team was recommended to talk to people in SAMEER.
2. The idea of social goal was appreciated and the team was also asked to think about possibility of setting up more than one ground stations to downlink the main data.
3. A number of queries were raised by the panel regarding the thermopile payload.
    a. Deviation of thermopiles from first order behavior.
    b. The resolution of thermopiles at the fringes.
    c. Variation of thermopiles with latitude of earth.
    d. How much will the resolution suffer due to jitter.
4. To solve all these problems the Payload Sub-System was asked to make these simple

simulation

a. Given a temperature profile on the surface values, the position of the satellite it should find out how much is the intensity of light received by each thermopile cell. This should take in to account all the things described above.

b. Given the readings at each thermopile array. The simulation should do the deconvolution and find out the temperature at each gridpoint on earth. Since payload people said that they had already done such simulation in 1D, they were told to present those results as well as extend them to 2D.

Attitude Determination and Control

1. The panel questioned the need for using sun sensor since the payload requirements were already met by the magnetometer itself. It was argued that given the time constraints that the team has, it would not be advisable to work on sun sensor integration since payload requirements were already being met.
2. It was asked if the magnetorquers would be kept on continuously or they would operate in pulses.
3. Simulation results for both orbit and attitude were asked.
4. The problem of procurement of GPS was explored and the team was asked to contact a company called ACCORD in Banglore if they could supply us with customized GPS.

On Board Computer

1. Questions about type of clock, and the variation of its characteristics in space and microgravity were asked.
2. Characteristics of ADC were also enquired and problem of quantization error was discussed.
3. The team was that the software difficulties were being underestimated by them.
4. Data compression was explored by the panel.

Communication

1. The panel asked the team to explore the possibility of uplink. Various advantages of uplink were cited.
2. It was commented that we did not have any provision to reset the data transmission if there was some problem with transmission the first time.
3. It was recommended to prioritize the data transmission using FFT or wavelet analysis so that we can send the overall photograph first and then send the details.
4. The idea of setting up multiple ground stations was discussed.

Power

1. It was asked to plot a Power vs weight and Power vs Volume chart for various microsatellites so that the team could know where they stand.
2. The team was also asked to present the simulations of power generated as a function of orbit and the attitude of the satellite.

Structures and Thermals

1. The weight and power budget were briefly discussed.
2. A detailed review meeting for the Structures Sub-System was fixed for 12th April. Shashank was asked to organize the meeting.