

Minutes from the January 18, 2002 MSFC PMC
Prepared by VS10/Rich Gladwin

Art Stephenson chaired the meeting. Rich Gladwin reviewed the agenda and gave a status of open actions. One previous action remains open. This action was assigned to evaluate whether dollar and manpower thresholds should be eliminated so that all projects would be required to report through the MSFC PMC. Mr. Gladwin indicated that over the past several months, the PMC had been operating in this fashion and that there did not appear to be undue burden on the Directorates to operate this way. Mr. Stephenson endorsed the concept that all projects should report through the MSFC PMC.

Gravity Probe B (GP-B) was asked to present first. Rex Geveden presented the first of two GP-B briefings. Mr. Geveden was giving the GP-B response to the Independent Implementation Review (IIR) team findings. Prior to the PMC, the Engineering Directorate (ED) had indicated it had some concerns about GP-B. Mr. Stephenson asked that ED discuss its top concerns. Malissa Meadows responded that she was most concerned about electronic box failures that could result from parts problems, configuration problems, development problems, and/or process problems. Ms. Meadows was concerned that several boxes were still in a development stage and that redesigns and reworks were still taking place on a regular basis. Ms. Meadows stated that the schedule pressure was increasing the probability for process escapes. Strained resources combined with high workload have also increased the likelihood of process escapes. Specifically, Ms. Meadows mentioned 3 major electronics boxes, which concerned her: SQUID Readout Electronics (SRE), Experiment Control Unit (ECU), and Gyroscope Suspension System (GSS). The environment at Stanford also concerned ED. Furthermore it has been a challenge to get data from Lockheed Martin and Stanford. ED expressed a low level of confidence in the way Lockheed has closed problem reports. Many problems have been closed rapidly, without MSFC knowledge or input. Action 1 was assigned to address these concerns. Mr. Stephenson stated that ED should not simply use the "purist" approach, but use cognitive thinking skills to help find solutions given where we are today. Mr. Geveden indicated that Stanford and Lockheed consider it a priority to improve the communication with MSFC.

ACTION 1:

Assigned to: SD30/Rex Geveden

Action: Determine the necessary course of action to relieve the concerns associated with GP-B electronic boxes, stress analysis, testing of electric cables, limited engineering insight, etc. Prepare a complete list of risk items and a corresponding mitigation strategy for each risk. Coordinate the list with ED42/Charlie Dischinger. Issue identification is not to be constrained by the current schedule or configuration of the vehicle. This action is to be closed by presentation to the Center Director and Engineering Directorate Director.

Due Date: 3/15/02

As Mr. Geveden was briefing the critical milestone completion trend, Denny Kross asked whether the correct milestones were being tracked. Mr. Geveden responded that the

milestones were all on the critical path to schedule and he believed that they were the correct milestones to be tracked.

While briefing the verification of design integrity, ED indicated that the Lockheed stress analysis was not fully documented. As an example, the hand analysis is missing the assumptions and loads that are necessary to validate the analysis. Lockheed has indicated it would be cost prohibitive to reproduce this documentation. MSFC is evaluating the criticality but does not have a solution at present. It may be necessary for either MSFC or Lockheed to go back and re-analyze the critical load structure. This specific concern should be addressed in the response to Action 1.

While discussing the IIR finding on lack of schedule margin, Denny Kross asked if retest had been included in the schedule. Mr. Geveden responded that it is implicitly in the schedule and that there was some slack that could be used for that purpose. Mr. Stephenson asked if fatigue from weekend and overtime work was driving employees too hard. It was recommended that Space Shuttle overtime policies be reviewed as a guide. Action 2 was assigned for this purpose.

ACTION 2:

Assigned to: SD30/Rex Geveden

Action: Evaluate the potentially negative effects associated with employee overtime and weekend work to ensure overtime work is not detrimental. Document the closure by letter to the Center Director.

Due Date: 2/01/02

Mr. Stephenson stated that we should consider the lessons learned from Hubble Space Telescope and Chandra X-Ray Observatory to not be under launch pressure and to not launch unless we can be confident that we are ready. Mr. Stephenson assigned another action for Mr. Geveden to convey this message to Stanford/Lockheed management.

ACTION 3:

Assigned to: SD30/Rex Geveden

Action: Discuss with Stanford/Lockheed management the philosophy to not launch unless we are confident that we are ready. Email the PMC secretariat when this action has been closed.

Due Date: 2/01/02

Axel Roth asked what the next critical milestone was. Mr. Geveden responded that the Payload electronics must be delivered by mid February. If that date were missed the program would take a hard look at slipping the schedule. Jack Bullman brought up an issue associated with lack of cable testing. Specifically, Mr. Bullman was concerned that the integrated tests performed on GP-B might not detect some faults in cables. Mr. Bullman stated that IR and DWV tests should have been performed. The cable issue could have negative impact to the schedule. The cable test issue is to be addressed in the response to action 1.

Mr. Stephenson stated that GP-B and ED should consider a wide range of mitigation strategies such as doing limited random tests, extensive testing, or 100% inspection. The program must listen to the risks identified by conservative thinkers, then evaluate if the risk is acceptable or if more test/analysis is required to help mitigate the risk. Ms. Meadows indicated that there could be significant cost and schedule impact associated with retesting. Mr. Stephenson stated that schedule and cost by themselves were not reason to avoid additional testing.

Mr. Geveden responded that some tests have been added to reduce technical risk, such as the Payload Acoustic Test. Denny Kross advised that GP-B should be working on contingency plans in case the February 15 payload electronics delivery does not occur. Bill Kilpatrick asked if the program reserves were adequate considering the liens and risks. Mr. Geveden replied that yes, the 2-3 months of reserves should be adequate.

Mr. Stephenson stated that he needed to better understand the risks and mitigation plan. This action was rolled into Action 1.

Buddy Randolph presented “GP-B Requirements Verification and Vehicle Acceptance”. While addressing the increased role for MSFC insight, ED expressed a concern that the MSFC role is sometimes a case of limited hindsight and not true insight. A question was raised if ED had ever reviewed and approved the GP-B verification plan. ED responded that it had approved a surveillance plan, but ED has never concurred that all requirements are adequate. Gerry Flanagan asked if there were cases of the test data not verifying the requirement. ED responded that this is likely since MSFC previously was not reviewing test plans and currently many tests were completed prior to MSFC receiving the test plans. At best MSFC has seen test plans after the fact. ED stated it was important to review test plans to ensure proper instrumentation, environments and test setup. ED also stated that MSFC should be invited to all Test Readiness Reviews but this is not always the case. Axel Roth indicated it was Stanford’s responsibility to ensure good communication with MSFC.

Bill Kilpatrick asked why a number of Verification Letters of Acceptance (VLOA) had been rejected. The rejections have occurred due to either incomplete data or missing data. Mr. Randolph acknowledged that educating Stanford as to what data is required for verification is a big challenge. Jim Bilbro asked if there were any software issues. Mr. Randolph responded that Software V&V is ongoing and that software seems to be a solid area. Mr. Geveden indicated that mission simulation had been accomplished and that Lockheed had retained a strong, skilled software team.

A concern was raised about the limited Lockheed/MSFC interface. The interface is limited to 2 people. Lockheed has said that increasing the interface with MSFC would slip the launch date and that it would also be cost prohibitive.

This concluded the GP-B presentations.

The Thunderstorm Observations and Research (ThOR) request for formulation was postponed to January 22. Jim Kennedy chaired this portion of the meeting for Art Stephenson.

Hugh Christian presented the ThOR request for commitment of MSFC resources necessary to complete the formulation phase. Mr. Kennedy asked if the ThoR technology was similar to that of other lightning detection payloads such as LIS and OTD. Dr. Christian responded that it was similar technology, but had some significant enhancements. Gerry Flanagan asked if the proposal team expected any significant findings from the Red Team review. Dr. Christian did not expect any significant findings, but he indicated there could be some suggested improvements from the technical and management side. Dr. Christian explained that much of the technology risks had already been reduced. Dr. Christian explained that there was some risk that Astrovision might not obtain all the necessary investment capital. This led the MSFC team into developing 2 separate approaches, with the second approach not being reliant on Astrovision. Mr. Kennedy asked if the proposal had included enough ED support for Approach 2. Dr. Christian responded that GSFC would be providing all the engineering insight and that the GSFC support was adequate. Mr. Kennedy asked when the team would select Approach 1 (data buy) or approach 2 (NSSTC managed). Dr. Christian indicated the decision would be made during formulation and that it would be made on a competitive basis. Bill Kilpatrick asked if the proposal team had considered subsidizing Astrovision with investment capital, given the cheaper cost and additional mission benefits of Approach 1. Dr. Christian said he had, but that it would require further investigation. Mr. Kilpatrick also questioned who would be responsible for configuration management for Approach 2. Dr. Christian responded that it would be done within the MSFC project resources. A recommendation was made to update the organization chart for Approach 2 to include the GSFC engineering support and Navy interfaces. Dr. Christian accepted this recommendation. Finally, the PMC endorsed the proposal and committed MSFC resources toward completion of the formulation phase.

Attendance for Center PMC
January 18, 2002

Name	Organization
<u>COUNCIL MEMBERS</u>	
Art Stephenson	DA01
Axel Roth	DE01/VS01
Bill Kilpatrick	ED01
Bob Goss (for Jan Davis)	FD01
Ann Whitaker	SD01
Denny Kross	TD01
Randy Humphries (for Alex McCool)	MP01
Joel Anderson (for Amanda Goodson)	QS01
Jim Carter (for Sheila Cloud)	AD01
Steve Beale	PS01
James McGroary (for Bill Hicks)	LS01
<u>OTHERS IN ATTENDANCE</u>	
Rich Gladwin (PMC Secretariat)	VS10
Gerald Flanagan	VS10
Jim Bilbro	DA01
Reginald Cobb	ED02
Michael Vanhooser	SD21
Todd May	SD30
Buddy Randolph	SD30
Rex Geveden	SD30
Steve Gentz	ED35
Charlie Dischinger	ED42
Malissa Meadows	ED15
Ted Edge	ED11
Morris Hammer	TD55
Kim Owen	FD32
Jeff Saxon	ED20
Marie Malone	SD30
Jim Hatfield	ED15
Nelson Parker	ED40
Andy Linskey	SD02
George Albright	NASA HQ Code S
Tony Lyons	SD30
Elaine Hamner	PS30
Jeff Kolodziejczak	SD50
Tim Miller	SD60
Roger Chassay	SD30
Hugh Christian	SD60

Attendance for Center PMC
January 22, 2002

Name	Organization
<u>COUNCIL MEMBERS</u>	
Jim Kennedy (for Art Stephenson)	DD01
Axel Roth	DE01/VS01
Bill Kilpatrick	ED01
Bob Goss (for Jan Davis)	FD01
Ann Whitaker	SD01
Randy Humphries (for Alex McCool)	MP01
Joel Anderson (for Amanda Goodson)	QS01
Jim Carter (for Sheila Cloud)	AD01
Steve Beale	PS01
James McGroary (for Bill Hicks)	LS01
<u>OTHERS IN ATTENDANCE</u>	
Rich Gladwin (PMC Secretariat)	VS10
Tim Miller	SD60
Hugh Christian	SD60
Jim Bilbro	DA01
Michael Vanhooser	SD21
Gerald Flanagan	VS10
Bill Simpson	RS40
Elaine Hamner	PS30
Sandy Coleman	SD03
Larry Russell	SD20
Dick Beranek	SD21
Marianne Huie	SD02
Sonny Mitchell	SD21
Jim Arnold	SD60