

**NASA JSC
Payload Safety Review Panel
Alpha-Magnetic Spectrometer-02
Status
Technical Interchange Meeting**

**Minutes of Meeting
June 22, 2010**

1.0 INTRODUCTION

1.1 General: The Payload Safety Review Panel (PSRP), chaired by JSC/OE/M.R. Surber, met on June 22, 2010, with representatives of the JSC/Engineering Directorate (Jacobs), the Payload Organization (PO), at the Regents Park III Conference Facility for an Alpha-Magnetic Spectrometer-02 Status Technical Interchange Meeting (TIM). JSC/NA2450/P. Mensingh, K. Chavez and R. Rehm, the supporting Payload Safety Engineers (PSEs), introduced the meeting and attendees (see Attachment 1).

1.2 Background: The PSRP held the following previous AMS-02 meetings:

- Helium Venting TIM on 04/20/00
- Phase 0/I Flight Safety Review (FSR) on 01/16/01
- Vacuum Jacket Leakage Special Topic Meeting on 10/11/01
- Gauss Limit Special Topic Meeting on 10/16/01
- TIM on 01/17/03
- Phase II FSR on 05/21-25/07
- HR TIM on 10/10/07
- NCR TIM on 12/10/08
- AMS-2 Burst Disk TIM on 08/13/09
- Phase III Joint PSRP/SRP FSR on 01/12-15/10
- Joint PSRP/SRP TIM on 03/23/10

1.3 Scope: This meeting focused on a PO briefing to the PSRP on the status of AMS-02 hardware updates, verification status, and anomaly reports. The PSRP reviewed no previous action items (AIs) associated with this payload in this meeting.

1.4 Conclusion: No agreements and no AIs resulted from this meeting. The PSRP reviewed no hazard reports (HRs) in this meeting. The PSRP will plan to hold the Delta Phase III FSR August 3-5, 2010.

2.0 SIGNIFICANT SAFETY DISCUSSION

2.1 AMS-02 Hardware Update: The PO summarized hardware changes since the Phase III FSR. The hardware completed electro-magnetic interference (EMI) and Thermal Vacuum (TV) testing. After the TV test, the PO decided to convert from a cryomagnet to a permanent magnet. The PO modified the tracker plane arrangement to maximize experiment resolution due to the magnet hardware change. The PO added the International Space Station Digital Data Recording System (ISS DDRS). The PO presented preliminary details at the Delta Critical Design Review (CDR). The PO clarified that they are using the previous permanent magnet flight unit (AMS-01 on STS-91—1997) as the flight unit for this mission. The PO performed a re-analysis and retested the magnet without epoxy (glue) and determined that, at ten times the force, the structure still did not fail.

2.2 AMS-02 Verification Update: The PO had to open a verification on the permanent magnet and determined that the 300- and 10-gauss fields are both acceptable and meet requirements. The PO presented a memo (MDR-SS-TM-7843A) indicating that a magnetic field strength of 50 gauss was acceptable for the Space Station Remote Manipulator System (SSRMS), but the Canadian Space Agency (CSA) stated that any magnetic field above 10 gauss was unacceptable. The 10 Gauss limit would require additional paperwork to assure that no part of the SSRMS enters into the keep out zone. If 50 Gauss is acceptable to CSA, this paperwork is not required as the 50 Gauss line is within the AMS-02 structure. Further coordination is required with CSA. The PO needs information from the Engineering Directorate—specifically, materials approval requires fracture control and composite-over-wrapped pressure vessel (COPV) approvals for final material approval. To address outgassing issues (associated with paint; two composites and fleece used in the Transition Radiation Detector (TRD) and the Ring Imaging Cerenkov Counter [RICH]) and the Fracture Control Addendum including assessment of the titanium struts, the PSRP Executive Officer will coordinate a working group meeting with the AMS PO, ES4-Materials and Processes, and the Station Environments Group (to include R. Mikitarian, M. Pedley, and S. Forth).

2.3 Digital Data Recording System: The PO explained that the DDRS provides data collection and storage and limited control for crew interaction, if needed. There are no hazardous commands to or from the DDRS. The PO has an optional 40' data cable that needs a routing plan, and the Expedite the Processing of Experiments to Space Station (EXPRESS) rack integrator will assess the cable to preclude entrapment. The PO identified that they plan to certify the DDRS on a STD HR.

2.4 Anomalies: Because the PO changed from the cryomagnet to a permanent magnet, the PO summarized the applicable and obsolete anomaly reports and their open or closed status. The anomaly reports on the cryomagnet and associated systems were deemed obsolete to the permanent magnet. The PO also summarized eleven new anomalies and their resolutions. These anomalies did not affect AMS-02 safety. The PO presented one anomaly that identified aluminum surface corrosion attributed to incomplete processing of an alodine application, identified as “Worm Tracks”. The PO stated that this did not have a structural concern and the worm tracks were repaired. The PSRP expressed concern that other places could have experienced the worm track effects. Although this is not a structural concern, it has now become a process concern. The PO stated they will examine the Power Distribution System (PDS) Avionics Box for further corrosive effects.

2.5 Safety Verification Activity: The PO reassessed all verifications for applicability after the change to the permanent magnet. The PO stated that some verifications were reopened conservatively. For the non-KSC verifications, the closure plan is associated with final inspections at Conseil Européen pour la Recherche Nucléaire (CERN), the European Organization for Nuclear Research near Geneva, Switzerland. Multi-layer insulation installation, electrical checkout, and KSC ground-processing/installation inspections have been updated to reflect hardware changes.

2.6 Safety Assessment:

2.6.1 Form 1428, Fire Detection and Suppression Reporting Form: *Not discussed in this meeting.*

2.6.2 Form 622, Reflown and Series Payload Hardware Reflight Assessment Reporting Sheet: *Not discussed in this meeting.*

2.6.3 Form 1114A, Certificate of Payload Safety Compliance: *Not discussed in this meeting.*

2.6.4 Form 906, ISS Cargo/Experiment Flight Safety Certificate Form: *Not discussed in this meeting.*

2.7 Hazard Report Discussion: *Not discussed in this meeting.*

3.0 **AGREEMENTS** – The PSRP made no agreements with the PO in this meeting.

Original Signed by:

JSC/NA2450/P. Mensingh
Payload Safety Engineer

Original Signed by:

JSC/NA2450/W. Stauffer
Technical Writer

Original Signed by:

JSC/NA2450/K. Chavez
Payload Safety Engineer

Original Signed by:

JSC/NA2450/R. Rehm
Payload Safety Engineer

Status of Hazard Reports Presented

The PSRP reviewed no HRs in this meeting.

Previous Action Item Status

The PSRP reviewed no previous AIs associated with this payload in this meeting.

ATTACHMENT 1

Payload Safety Review Attendance Log

Payload: PayloadNameHere Phase 0/III Flight Safety Review TIM

Meeting Date: MonthDateHere, 2010

Mail Code	Name	Phone 281	X
CHAIRMAN			
OE	Surber, M.	483-4626	X
OE	Vassberg, N.J.	244-8389	X
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CB	Rickard, J.	483-3760	X
DA8/USA	Knutson, D.	483-4405	X
EA441	Henning, G.N.	483-0533	X
MO2/USA	Wood, W.	280-6844	X
NE14	Guidry, R.	244-5510	X
NE14	Moreland, D. W.	483-5549	X
MSFC/JS-20	Johnson, P.T.	256-961-4646	X
SM	Spann, R.	483-3807	X
NT	Shea, M.	335-2142	X
EP4/Jacobs	Manha, W.	483-6439	X
ESCG/JACOBS	Hall, C.	461-5565	X
ES4/Jacobs	Martinez, A.N.	461-5428	X
ESCG/JACOBS	Russell, D.	461-5144	X
ESCG/JACOBS	Runnells, J.	461-5019	X
NA2450/GHG	Chavez, K.	335-2364	X
NA2450/GHG	Mensingh, P.	335-2363	X
NA2450/GHG	Rehm, R.	335-2374	X
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