



Alpha Magnetic  
Spectrometer NASA / DOE

# *Open Paper Management Tool Open Items Report*



National Aeronautics and  
Space Administration

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*Friday, October 14, 2005*

## *Open Paper Management Tool (OPMT) Statistics*

<b>Total Action Items:</b>	<b>553</b>	<b>Total Action Items Open:</b>	<b>135</b>
<b>Total Action Items Closed:</b>	<b>418</b>	<b>Action Items Past Due:</b>	<b>102</b>

**List of Action Items Past Due:**

<i>Action Item Number:</i>	<i>Date Due:</i>	<i>Action Item Number:</i>	<i>Date Due:</i>	<i>Action Item Number:</i>	<i>Date Due:</i>
<i>Action Item 04-046</i>	<i>07/31/2005</i>	<i>Action Item 05-060</i>	<i>10/15/2005</i>	<del><i>AMS_02-ACOP_PDR-19-2</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 04-051</i>	<i>08/30/2005</i>	<i>Action Item 05-061</i>	<i>10/10/2005</i>	<del><i>AMS_02-ACOP_PDR-23</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 04-056</i>	<i>08/15/2005</i>	<i>Action Item 05-062</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-24</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 04-120</i>	<i>03/31/2005</i>	<i>Action Item 05-063</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-26</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-010</i>	<i>09/30/2005</i>	<i>Action Item 05-064</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-28</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-011</i>	<i>09/30/2005</i>	<i>Action Item 05-066</i>	<i>10/15/2005</i>	<del><i>AMS_02-ACOP_PDR-29</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-012</i>	<i>09/30/2005</i>	<i>Action Item 05-067</i>	<i>09/16/2005</i>	<del><i>AMS_02-ACOP_PDR-36</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-013</i>	<i>08/01/2005</i>	<i>Action Item 05-069</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-37</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-015</i>	<i>08/15/2005</i>	<del><i>AMS_02-ACOP_PDR-01</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-38</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-017</i>	<i>09/05/2005</i>	<del><i>AMS_02-ACOP_PDR-02</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-39</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-018</i>	<i>10/01/2005</i>	<del><i>AMS_02-ACOP_PDR-04</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-40-1</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-046</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-06</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-41</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-052</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-07-1</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-42</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-053</i>	<i>09/22/2005</i>	<del><i>AMS_02-ACOP_PDR-07-2</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-43</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-054</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-11-2</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-48-2</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-055</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-14</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-50-1</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-056</i>	<i>09/30/2005</i>	<del><i>AMS_02-ACOP_PDR-16</i></del>	<del><i>10/15/2005</i></del>	<del><i>AMS_02-ACOP_PDR-54-2</i></del>	<del><i>10/15/2005</i></del>
<i>Action Item 05-058</i>	<i>10/15/2005</i>	<del><i>AMS_02-ACOP_PDR-17</i></del>	<del><i>10/15/2005</i></del>	<i>AMS_02-CDR-08</i>	<i>07/31/2005</i>
<i>Action Item 05-059</i>	<i>09/21/2005</i>	<del><i>AMS_02-ACOP_PDR-18</i></del>	<del><i>10/15/2005</i></del>	<i>AMS_02-CDR-12</i>	<i>03/31/2005</i>

## *Open Paper Management Tool (OPMT) Statistics*

<i>Action Item Number:</i>	<i>Date Due:</i>				
<i>AMS_02-CDR-13</i>	<i>03/31/2005</i>	<i>AMS_02-TTCS_PDR-9</i>	<i>07/15/2005</i>	<i>UPS-CDR-06</i>	<i>08/26/2005</i>
<i>AMS_02-PDS_CDR-06</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-10</i>	<i>07/15/2005</i>	<i>UPS-CDR-07</i>	<i>08/26/2005</i>
<i>AMS_02-PDS_CDR-08</i>	<i>05/16/2005</i>	<i>AMS_02-TTCS_PDR-11</i>	<i>07/15/2005</i>	<i>UPS-CDR-08</i>	<i>08/26/2005</i>
<i>AMS_02-PDS_CDR-09-2</i>	<i>05/16/2005</i>	<i>AMS_02-TTCS_PDR-12</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-03</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-14</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-06</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-15</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-15</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-16</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-17</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-17</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-56</i>	<i>08/01/2005</i>	<i>AMS_02-TTCS_PDR-18</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-57</i>	<i>06/01/2005</i>	<i>AMS_02-TTCS_PDR-19</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-60</i>	<i>08/15/2005</i>	<i>AMS_02-TTCS_PDR-20</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-68</i>	<i>06/15/2005</i>	<i>AMS_02-TTCS_PDR-23</i>	<i>07/15/2005</i>		
<i>AMS_02-Thermal_CDR-82</i>	<i>08/01/2005</i>	<i>AMS_02-TTCS_PDR-25</i>	<i>06/30/2005</i>		
<i>AMS_02-TTCS_PDR-1</i>	<i>07/15/2005</i>	<i>AMS_02-TTCS_PDR-26-1</i>	<i>06/15/2005</i>		
<i>AMS_02-TTCS_PDR-2</i>	<i>07/15/2005</i>	<i>AMS_02-TTCS_PDR-26-2</i>	<i>07/15/2005</i>		
<i>AMS_02-TTCS_PDR-3</i>	<i>07/15/2005</i>	<i>AMS_02-TTCS_PDR-27</i>	<i>06/30/2005</i>		
<i>AMS_02-TTCS_PDR-4</i>	<i>07/15/2005</i>	<i>UPS-CDR-01</i>	<i>08/26/2005</i>		
<i>AMS_02-TTCS_PDR-5</i>	<i>07/15/2005</i>	<i>UPS-CDR-02</i>	<i>08/26/2005</i>		
<i>AMS_02-TTCS_PDR-6</i>	<i>07/15/2005</i>	<i>UPS-CDR-03</i>	<i>08/16/2005</i>		
<i>AMS_02-TTCS_PDR-7</i>	<i>07/15/2005</i>	<i>UPS-CDR-04</i>	<i>08/26/2005</i>		
<i>AMS_02-TTCS_PDR-8</i>	<i>07/15/2005</i>	<i>UPS-CDR-05</i>	<i>08/26/2005</i>		

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## Open Action Items Report

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**Open Item Number:** 04-046

**RID Open Date:** 8/1/2004

**Title:**

**Intiator(s):**

**Description:**

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### Action Item Information

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**Actionee(s):** Bill Hungerford/AMS  
Trent Martin/EA

**Action Due Date:** 7/31/2005

**Action:** *Build an integrated logic flow, assembly, and test schedule for the payload at CERN. Include a clear plan for Quality Control and MRB authority. Include iterative electrical/functional testing to ensure adequate operation of hardware/software before access to any given crate or detector is no longer possible.*

**Action Status:** 8/29/2005 - JSC review in process - document should be ready for collaboration review by 9 Sep.  
8/19/2005 - Draft version released for JSC review.  
8/15/2005 - Draft version of plan expected by 8/31/2005.  
2/09/2005 - We will build an integrated plan at JSC to go through with the AMS Collaboration. The plan will have to be approved by the AMS Collaboration. The plan is to have: (1) NASA representative at CERN for the integration process and (2) NASA provide a quality representative to be at CERN at all time for quality control during integration process.  
08/01/04 - Plan due by 09/18/04; Questionnaire sent to detector groups to initiate process. Meeting scheduled at CERN Sept 13 and 14, chaired by Giuliano Laurenti, to consolidate and refine inputs from various detector and sub-system groups. Should result in development of preliminary schedule for review at October TIM

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## *Open Action Items Report*

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***Open Item Number:*** 04-051

***RID Open Date:*** 8/1/2004

***Title:***

***Intiator(s):***

***Description:***

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### *Action Item Information*

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***Actionee(s):*** OZ/Bob Miley

***Action Due Date:*** 8/30/2005

***Action:*** Complete and sign AMS PIA.

***Action Status:*** 8/26/2005 - Based on agreement with Hartman, OZ will attempt to sign PIA prior to October TIM. OZ FY2006 AMS funding under review.  
8/8/2005 - Hartman meeting moved to 8/26. PIA CR release moved to 9/9. PIA signataure still scheduled for 12/1.  
8/3/2005 - Hartman meeting moved to 8/19. PIA CR scheduled to be released 8/30. PIA scheduled to be signed 12/1.  
5/25/2005 - Meeting scheduled with Dan Hartman on 7/13 to resolve all final issues, PIA scheduled to be signed on 8/30. Specific TBDs being transferred into new OPMT items 05-010, 05-011, and 05-012.  
3/02/2005 - It will be three weeks before it is known the amount of power to be provided. It will not be 3kW. Win Reid/OZ to set up meeting with Chris Tutt, Trent Martin, Craig Clark, John Cornwell, and Henry Hoang. Due date for this action item was changed to June 30, 2005.  
02/09/2005 - ISS ICD – turning in PIA baselined first. Plan to remove the TBRs. Win Reid to check on the actions on the ISS side.  
12/10/2004 - ISS ICD to be released 02/05; question how to get into official documentation.

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## *Open Action Items Report*

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**Open Item Number:** 04-056

**RID Open Date:** 8/1/2004

**Title:**

**Intiator(s):**

**Description:**

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### *Action Item Information*

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**Actionee(s):** Chris Tutt/ESCG  
Bill Hungerford/AMS  
Paul Nemeth/ESCG

**Action Due Date:** 8/15/2005

**Action:** *Provide the plan for Surveillance of Safety Critical assembly and test steps of Collaboration Hardware.*

**Action Status:** 8/15/2005 - Initial surveillance request due out by 8/30/2005.  
8/3/2005 - Chris Tutt to review current schedule and SVMs and send out verification requests to relevant parties. MVP still in work, so Surveillance Plan on hold.  
2/9/2005 - Mike Fohey and David Kaplan to discuss the MVP schedule. The MVP is a deliverable on the ESCG contract and is to be delivered no later than 8 months from February 1, 2005.

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## *Open Action Items Report*

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**Open Item Number:** 04-120

**RID Open Date:** 12/6/2004

**Title:**

**Intiator(s):**

**Description:**

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### *Action Item Information*

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**Actionee(s):** Leland Hill/ESCG

**Action Due Date:** 3/31/2005

**Action:** *Work with all AMS experimenters to close out all open issues associated with the Phase II Flight Safety Review Safety Data Package.*

**Action Status:** *8/29/2005 - Release date now presumed to be 9/9. All comments still to be incorporated by 9/30.  
8/15/2005 -Draft versions of the writeup due by 8/31, full JSC review and all comments incorporated by 9/30.  
8/8/2005 - Trent Martin to send updated list of final items to various group leads.  
8/3/2005 - Many issues resolved, but cryomagnet and TTCS still have major open items.  
6/29/2005 - Letter has been distributed to the collaboration.  
5/25/2005 - Letter describing all open actions has been prepared and forwarded to Prof. Ting.  
4/27/2005 - New set of actions in work. Some actions have been answered. Addressing specific organizations/individuals that have not responded. Safety package should be ready by the end of June to distribute to the collaboration approximately two weeks before the July TIM. Responses from the collaboration will be due prior to or during the TIM. The safety package will be updated and redistributed to the collaboration after the TIM. Trent Martin/EA2 requested to see a status of action items at each CCB/Tag-up meeting. Per Trent Martin/EA2, hold firm to the May 31st due date for new list of action items.  
1/19/05 - Some data has been received since the October TIM and January TIM; Some data not due until March 2005; Due date was changed from 1/31/05 to 3/31/05; Final Safety Data Package due 03/08/05.*

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## *Open Action Items Report*

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**Open Item Number:** 05-010

**RID Open Date:** 5/25/2005

**Title:** *Input Fiber Channels*

**Intiator(s):**

**Description:**

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### *Action Item Information*

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**Actionee(s):** *Bob Miley/OZ*

**Action Due Date:** 9/30/2005

**Action:** *AMS PIA requests use of two input fibers by ACOP on a permanent basis. This configuration needs to be approved by OZ and documented in the ICD. Negotiate agreement between ISS and AMS for use of two input fibers and document agreement in ICD.*

**Action Status:**

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## *Open Action Items Report*

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*Open Item Number: 05-011*

*RID Open Date: 5/25/2005*

*Title: Total Power Usage by AMS-02*

*Initiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s): Bob Miley/OZ*

*Action Due Date: 9/30/2005*

*Action: AMS PIA requests 2800 W power in worst case conditions. Allowed maximum power consumption by AMS needs to be agreed with ISS program and documented in the ICD.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number:* 05-012

*RID Open Date:* 5/25/2005

*Title:* S-Band Usage

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s):* Bob Miley/OZ

*Action Due Date:* 9/30/2005

*Action:* AMS PIA requests an average of 10 bytes/sec of Critical Health Data be transferred through the S-band antenna.  
Negotiate agreement between ISS and AMS On S-band usage and document in ICD.

*Action Status:*

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## Open Action Items Report

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**Open Item Number:** 05-013

**RID Open Date:** 5/25/2005

**Title:** HRDL Connectors

**Intiator(s):**

**Description:**

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### Action Item Information

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**Actionee(s):** Win Reid/OZ

**Action Due Date:** 8/1/2005

**Action:** Provide HRDL connectors to ACOP as GFE.

**Action Status:** 9/2/2005 - Dave Beverly, JSC/EV - EEE parts, has final approval authority for dispensing the ISS program reserve fiber. At his request, we are investigating the use of a COTS available fiber. Technical assessment from MIT Capell and Dennett is that it is acceptable. Fiber is "radiation hardened", but JS materials is verifying. Nguyen is assessinig whether fiber has any flight history. Should this fiber prove unacceptable, we will obtain the ISS program reserve fiber. Beverly has approved the use of connectors and contacts.

8/28/2005 - Dan Cain/Boeing provided list of which requested items were in available inventory. Peter Dennett to define final requirements and then NASA to make formal request to Tony Butina/OB.

8/22/2005 - Dewey Nguyen to release new schematic and spreadsheet listing all required connectors by 8/25. Addition of this requirement to PIA to be discussed with Dan Hartman/OZ at 8/29 meeting.

8/15/2005 - Final list of required connectors to be defined by 8/31. Tim Urban to review what cable lengths can be made.

8/3/2005 - Tim Urban and Dewey Nguyen to look at cable length requirements and re-evaluate number of connectors needed. Peter Dennett to provide front panel diagram to Win Reid. Dewey also evaluating other connector sources.

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## *Open Action Items Report*

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***Open Item Number:*** 05-015

***RID Open Date:*** 8/3/2005

***Title:*** MLI Specification

***Intiator(s):*** Trent Martin/EA

***Description:*** AMS-02 MLI Specification needed.

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### *Action Item Information*

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***Actionee(s):*** John Cornwell/EC

***Action Due Date:*** 8/15/2005

***Action:*** Develop AMS-02 MLI specification. Upon release of specification, CGS to revise MLI weight estimates and update mass budget accordingly.

***Action Status:*** 8/28/2005 - Draft specification released 8/25, under review at JSC.  
8/22/2005 - Trent Martin to contact Chen Lin and determine new release date for draft specification. Second part of action added with Marco Molina/CGS identified as actionee.  
8/15/2005 - John Cornwell plans to release draft specification by COB today for JSC review. Review comments incorporated and out for Collaboration review by 8/23. Specification will be formally released through CCB as a CR.

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## *Open Action Items Report*

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***Open Item Number:*** 05-017

***RID Open Date:*** 8/22/2005

***Title:*** UPS maximum temperature

***Intiator(s):*** Tim Urban

***Description:*** UPS worst case hot temperature including magnet charging needs to be included in thermal ICD and thermal test plans.

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### *Action Item Information*

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***Actionee(s):*** Craig Clark/ESCG

***Action Due Date:*** 9/5/2005

***Action:*** Calculate new UPS worst case temperature and provide to CGS.

***Action Status:*** 9/2/2005 - Clark has provided worst case conditions to CGS, and has requested analysis results for these cases. These results will be incorporated in the next UPS SOW revision.

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## *Open Action Items Report*

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*Open Item Number: 05-018*

*RID Open Date: 8/22/2005*

*Title: Thermal Testing Requirements*

*Intiator(s): Tim Urban*

*Description: UPS worst case hot temperature including magnet charging needs to be included in thermal ICD and thermal test plans.*

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### *Action Item Information*

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*Actionee(s): Tim Urban*

*Action Due Date: 10/1/2005*

*Action: Upon completion of 05-017, update CSIST SOW to ensure that thermal testing done to appropriate temperature levels.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-019*

*RID Open Date: 9/13/2005*

*Title: Nonlinear Strap Installation Stand*

*Intiator(s):*

*Description: Determine whether or not the Nonlinear Strap Installation Stand designed by SCL can be used at JSC for STA installation.*

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### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL, Chris Tutt/ESCG*

*Action Due Date: 10/17/2005*

*Action: SCL to provide ESCG with any stress analysis done to support design of the installation stand for review against JSC safety standards. Alternatively, SCL to provide drawings to ESCG to support safety analysis.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-020*

*RID Open Date: 9/13/2005*

*Title: Cryocooler Finger Deflection Analysis*

*Intiator(s):*

*Description: Provide copies of the Cryocooler cold finger deflection analysis to ESCG for review.*

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### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL*

*Action Due Date: 10/17/2005*

*Action: Provide copies of the Cryocooler cold finger deflection analysis to ESCG for review.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-021*

*RID Open Date: 9/13/2005*

*Title: MLI Performance under Welding Heat Loads*

*Intiator(s):*

*Description: Determine whether magnet MLI will survive thermal loads from welding operations without significant damage.*

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### *Action Item Information*

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*Actionee(s): Phil Mott/ESCG, Stephen Harrison/SCL*

*Action Due Date: 11/21/2005*

*Action: Determine what size MLI sample could be inserted into the STA easily underneath the weld area using scrap MLI already available at SCL.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number:* 05-022

*RID Open Date:* 9/13/2005

*Title:* Cryosystem Component Testing

*Intiator(s):*

*Description:* Demonstrate how cryosystem components will be validated with a non-cryogenic STA.

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### *Action Item Information*

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*Actionee(s):* Chris Tutt/ESCG, Stephen Harrison/SCL, Phil Mott/ESCG

*Action Due Date:* 11/21/2005

*Action:* Develop plan for validating all cryosystem components, either through component level testing or analysis.

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-023*

*RID Open Date: 9/13/2005*

*Title: STA Gate Valve*

*Intiator(s):*

*Description: APO will provide the gate valve for the STA article using a single-seal off-the-shelf valve.*

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### *Action Item Information*

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*Actionee(s): Phil Mott/ESCG*

*Action Due Date: 10/17/2005*

*Action: Procure requested gate valve and provide to building 10 for integration onto the STA VC.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-024*

*RID Open Date: 9/13/2005*

*Title: Flight Unit Gate Valve*

*Intiator(s):*

*Description: Flight VC requires gate valve with double-seals.*

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### *Action Item Information*

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*Actionee(s): Phil Mott/ESCG, Stephen Harrison/SCL*

*Action Due Date: 11/21/2005*

*Action: Design modified gate valve incorporating double O-ring seals and provide to SCL for installation onto the flight unit.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-025*

*RID Open Date: 9/13/2005*

*Title: STA Parts List*

*Initiator(s):*

*Description: Develop a parts list for the full STA VC.*

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### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL*

*Action Due Date: 10/17/2005*

*Action: Provide copies of the STA design drawings and Bill of Materials to ESCG in order to pull them into a complete Parts List.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-026*

*RID Open Date: 9/13/2005*

*Title: Exchange Rate Issues*

*Intiator(s):*

*Description: Determine what can be done to mitigate the impact of exchange rate fluctuations on JS subcontracts.*

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### *Action Item Information*

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*Actionee(s): Chris Tutt/ESCG*

*Action Due Date: 10/17/2005*

*Action: Work with Michelle Katz and Karen Dahlman to see what options are available through the JS business office.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number:* 05-028

*RID Open Date:* 9/13/2005

*Title:* Russian Funding Issues

*Intiator(s):*

*Description:* Provide necessary data to allow remainder of Russian burst disk/strap funding to be released.

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### *Action Item Information*

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*Actionee(s):* Stephen Harrison/SCL

*Action Due Date:* 10/17/2005

*Action:* Determine what information is currently available to address Russian concerns about strap development and provide to Prof. Hans Hofer/ETH.

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-029*

*RID Open Date: 9/13/2005*

*Title: CTG Strap Assembly Option*

*Intiator(s):*

*Description: Determine whether or not assembly of the straps at CTG instead of SCL is a cost-effective way of saving schedule.*

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### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL*

*Action Due Date: 10/17/2005*

*Action: Provide cost and schedule estimates for 1) CTG to assemble straps, and 2) SCL to assemble straps using additional technicians.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-030*

*RID Open Date: 9/13/2005*

*Title: Potential Schedule Savings*

*Intiator(s):*

*Description: Review with collaboration several options for saving magnet schedule.*

---

### *Action Item Information*

---

*Actionee(s): Stephen Porter/NASA*

*Action Due Date: 11/21/2005*

*Action: Develop presentation showing schedule savings arising from 1) early delivery of He tank components, 2) delivery of Magnet Test Rig from Chinese sources, 3) early delivery of burst disks, 4) full funding of nonlinear straps (including assembly at CTG), and 5) funding to allow hiring of additional techs at SCL.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-031*

*RID Open Date: 9/13/2005*

*Title: SCL FY '06 Funding*

*Intiator(s):*

*Description: Review SCL FY06 funding status with collaboration.*

---

### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL*

*Action Due Date: 10/17/2005*

*Action: Provide FY'06 phased spending plan to NASA.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number:* 05-032

*RID Open Date:* 9/13/2005

*Title:* CAB Magnet Charging Cables Strain Relief

*Intiator(s):*

*Description:* Design and build a strain relief device for the CAB magnet charging cables.

---

### *Action Item Information*

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*Actionee(s):* Stephen Harrison/SCL

*Action Due Date:* 11/21/2005

*Action:* Provide proposal for development and manufacturing of a strain relief device for the CAB charging cables to NASA.

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-033*

*RID Open Date: 9/13/2005*

*Title: HBE He Tank Contract*

*Intiator(s):*

*Description: Sign subcontract with HBE for development of the flight Helium tank and provide phased spending plan to NASA.*

---

### *Action Item Information*

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*Actionee(s): Chris Tutt/ESCG*

*Action Due Date: 10/17/2005*

*Action: Sign subcontract with HBE for development of the flight Helium tank and provide phased spending plan to NASA.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-034*

*RID Open Date: 9/13/2005*

*Title: CAB/PDS schedules*

*Intiator(s):*

*Description: Determine ways to save schedule in CAB and PDS*

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### *Action Item Information*

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*Actionee(s): Mike Capell/MIT, John Heilig/ESCG*

*Action Due Date: 10/17/2005*

*Action: Review schedules for CAB development, PDS development, and CERN integration, to determine what the critical path items are and develop ways to save overall schedule.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number:* 05-035

*RID Open Date:* 9/13/2005

*Title:* TRD Gas Supply Schedule

*Intiator(s):*

*Description:* Include TRD Gas Supply development into overall AMS-02 schedule.

---

### *Action Item Information*

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*Actionee(s):* John Heilig/ESCG, Martina Green/MIT

*Action Due Date:* 10/17/2005

*Action:* Provide latest TRD Gas system integration schedule and integrate into the overall AMS-02 schedule.

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-036*

*RID Open Date: 9/13/2005*

*Title: ILK/WEKA Schedule*

*Intiator(s):*

*Description: Review current status at ILK and WEKA and recommend a course of action.*

---

### *Action Item Information*

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*Actionee(s): Trent Martin/NASA, Stephen Harrison/SCL*

*Action Due Date: 10/17/2005*

*Action: Review current status at ILK and WEKA and recommend a course of action.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-038*

*RID Open Date: 9/13/2005*

*Title: Magnet Weight Status*

*Intiator(s):*

*Description: Develop detailed magnet weight estimate.*

---

### *Action Item Information*

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*Actionee(s): Trent Martin/NASA, Chris Tutt/ESCG*

*Action Due Date: 11/21/2005*

*Action: Review weight status of all magnet-related items discussed at Culham meeting. For each item, determine when item will be weighed and whose mass budget they come out of.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number:* 05-039

*RID Open Date:* 9/13/2005

*Title:* Total Mass Capability of USS-02

*Intiator(s):*

*Description:* Determine total mass capability of USS-02

---

### *Action Item Information*

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*Actionee(s):* Chris Tutt/ESCG, Bruce Sommer/ESCG

*Action Due Date:* 11/21/2005

*Action:* Review structural analysis of AMS-02 and develop first-order estimate for how much additional mass can be carried without modifying the existing structure.

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-040*

*RID Open Date: 9/13/2005*

*Title: Total AMS-02 Payload Weight*

*Intiator(s):*

*Description: Develop plan for getting more realistic estimate of entire AMS-02 weight.*

---

### *Action Item Information*

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*Actionee(s): Stephen Porter/NASA, Trent Martin/NASA*

*Action Due Date: 11/21/2005*

*Action: Develop plan for getting more realistic estimate of entire AMS-02 weight.*

*Action Status: 10/5/2005 - Trent Martin requested AMS control weight be increased from 14,809 lbs to 15,100 lbs. Magnet weight was reviewed and found to be over by 124 kg. APO will ask for a review of the TCS weight at the next TWG meeting. Trent Martin will ask for current weight estimates from each of the detector leads, combine the weights and compare it to the current collaboration estimates before the next TIM.*

---

## *Open Action Items Report*

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*Open Item Number: 05-041*

*RID Open Date: 9/14/2005*

*Title: Infrared Cameras in TV Test*

*Intiator(s):*

*Description: If ESTEC is to purchase an IR camera to support the AMS-02 TV test, then they need justification to take to their management.*

---

### *Action Item Information*

---

*Actionee(s): John Cornwell/NASA*

*Action Due Date: 10/28/2005*

*Action: Describe how IR camera will be used during test and provide justification of why equivalent data cannot be collected by other means*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number:* 05-042

*RID Open Date:* 9/14/2005

*Title:* Helium Venting Hazard Analysis

*Intiator(s):*

*Description:* Provide hazard analysis for venting of helium from the main tank.

---

### *Action Item Information*

---

*Actionee(s):* Chris Tutt/ESCG

*Action Due Date:* 10/28/2005

*Action:* Take existing hazard analysis of helium venting presented to NASA and create stand-alone report for delivery to ESTEC.

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-043*

*RID Open Date: 9/14/2005*

*Title: Helium Venting Hazard Analysis*

*Intiator(s):*

*Description: Provide hazard analysis for venting of helium from the main tank.*

---

### *Action Item Information*

---

*Actionee(s): Gaetan Piret/ESTEC*

*Action Due Date: 11/30/2005*

*Action: Upon delivery of hazard analysis described in 05-042, evaluate potential hazards to EMI and TV test chambers.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-044*

*RID Open Date: 9/14/2005*

*Title: Burst Disk Vent Lines*

*Intiator(s):*

*Description: Attaching a vent line to the burst disk vent location would simplify test setup.*

---

### *Action Item Information*

---

*Actionee(s): Phil Mott/ESCG*

*Action Due Date: 10/28/2005*

*Action: Evaluate feasibility of attaching a vent line at the main tank burst disk vent location.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-046*

*RID Open Date: 9/14/2005*

*Title: Thermal Math Model Compatibility*

*Intiator(s):*

*Description: LSS and AMS thermal models must be brought into a compatible software package in order to do pre-test analysis.*

---

### *Action Item Information*

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*Actionee(s): Gaetan Piret/ESTEC*

*Action Due Date: 9/30/2005*

*Action: ESTEC to determine the most cost-effective method for converting the LSS model into a SINDA compatible format..*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-047*

*RID Open Date: 9/14/2005*

*Title: EMI Test Costs*

*Intiator(s):*

*Description: Provide cost estimate for EMI test.*

---

### *Action Item Information*

---

*Actionee(s): Gaetan Piret/ESCG*

*Action Due Date: 10/28/2005*

*Action: Provide cost estimate for EMI test.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-048*

*RID Open Date: 9/14/2005*

*Title: LSS Vacuum Gages*

*Intiator(s):*

*Description: Determine whether LSS vacuum gages will function within the AMS-02 magnetic field.*

---

### *Action Item Information*

---

*Actionee(s): Gaetan Piret/ESTEC*

*Action Due Date: 11/30/2005*

*Action: Determine whether LSS vacuum gages will function within the AMS-02 magnetic field.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-049*

*RID Open Date: 9/16/2005*

*Title: Supercritical Startup*

*Intiator(s):*

*Description: Determine whether or not the TTCS pumps can be started with vapor in the pump.*

---

### *Action Item Information*

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*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 10/31/2005*

*Action: Perform test to determine performance of the pump while pumping vapor, including expected bearing life and pressure head.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-052*

*RID Open Date: 9/16/2005*

*Title: TTCS Startup Chances*

*Initiator(s):*

*Description: Estimate how time the TTCB will spend in orbits in which both sides cannot be started.*

---

### *Action Item Information*

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*Actionee(s): Christian Vettore/CGS, Johannes Van Es/NLR*

*Action Due Date: 9/30/2005*

*Action: Upon selection of a TTCB box design (pending results of items 05-049, 05-050, and 05-051), determine in which orbits both sides of the TTCB will be unable to start and estimate how much time AMS-02 will remain in that situation.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number:* 05-053

*RID Open Date:* 9/16/2005

*Title:* CO2 Levels

*Intiator(s):*

*Description:* TTCS requires an adequate CO2 charge prior to launch.

---

### *Action Item Information*

---

*Actionee(s):* Johannes Van Es/NLR

*Action Due Date:* 9/22/2005

*Action:* Assess whether TTCS systems should be refilled prior to launch.

*Action Status:* 9/23/2005 - CAST investigating whether or not accumulator volume can be inspected ultrasonically.

---

## *Open Action Items Report*

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*Open Item Number: 05-054*

*RID Open Date: 9/16/2005*

*Title: Leak Before Burst Analysis*

*Intiator(s):*

*Description: Determine whether current condensor tube design is acceptable to NASA safety community.*

---

### *Action Item Information*

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*Actionee(s): Chris Tutt/ESCG*

*Action Due Date: 9/30/2005*

*Action: Obtain written concurrence from Glenn Ecord and Bill Manha that existing condensor tube design and verification plan are acceptable.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-055*

*RID Open Date: 9/16/2005*

*Title: Thermal Switch Requalification*

*Intiator(s):*

*Description: Thermal switches need to be certified to -120C to avoid detailed heater circuit safety analysis.*

---

### *Action Item Information*

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*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 9/30/2005*

*Action: Develop plan for certifying TTCS thermal switches for operation at -120C.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number:* 05-056

*RID Open Date:* 9/16/2005

*Title:* Thermal Software Compatibility

*Intiator(s):*

*Description:* Resolve compatibility issues between NLR and SYSU thermal software.

### *Action Item Information*

*Actionee(s):* Johannes Van Es/NLR, Zhenhui He/SYSU

*Action Due Date:* 9/30/2005

*Action:* Resolve compatibility issues between NLR and SYSU thermal software.

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-057*

*RID Open Date: 9/16/2005*

*Title: Two-Phase Modelling*

*Intiator(s):*

*Description: Provide details on specific two-phase modelling assumptions used in TTCS analysis.*

---

### *Action Item Information*

---

*Actionee(s): Aswin Pauw/NLR*

*Action Due Date: 10/31/2005*

*Action: Provide description of two-phase modelling assumptions used to NASA for review.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-058*

*RID Open Date: 9/16/2005*

*Title: Two-Phase Flow*

*Intiator(s):*

*Description: Evaluate split of two-phase flow exiting the heat exchanger*

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### *Action Item Information*

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*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 10/15/2005*

*Action: Review analysis of two-phase flow of CO2 exiting heat exchanger and ensure that assumptions made for dividing the flow between the two loops were appropriate.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-059*

*RID Open Date: 9/16/2005*

*Title: Two-Phase Flow Paper*

*Intiator(s):*

*Description: Provide paper on two phase flow in small diameter tubes and geometric vapor flow blocker*

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### *Action Item Information*

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*Actionee(s): John Cornwell/NASA, Gene Ungar/NASA*

*Action Due Date: 9/21/2005*

*Action: Provide paper to NLR.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-060*

*RID Open Date: 9/16/2005*

*Title: ID Tolerances*

*Intiator(s):*

*Description: Assess the effect of inner diameter manufacturing tolerances on pressure drop and thawing MDP in condenser tubes.*

---

### *Action Item Information*

---

*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 10/15/2005*

*Action: Assess the effect of inner diameter manufacturing tolerances on pressure drop and thawing MDP in condenser tubes.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-061*

*RID Open Date: 9/16/2005*

*Title: Accumulator Design Review*

*Intiator(s):*

*Description: Arrange TWG Design Review of the TTCS Accumulator at October TIM in Geneva.*

### *Action Item Information*

*Actionee(s): John Cornwell/NASA, Johannes Van Es/NLR*

*Action Due Date: 10/10/2005*

*Action: Arrange TWG Design Review of the TTCS Accumulator at October TIM in Geneva.*

*Action Status: 9/23/2005 - October 26 and/or 27 have been proposed as DR dates. Awaiting concurrence from CAST.*

---

## *Open Action Items Report*

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*Open Item Number: 05-062*

*RID Open Date: 9/16/2005*

*Title: TTCB Integration*

*Intiator(s):*

*Description: Assess TTCB integration procedures against SCL Warm Valve Box and TRD Gas Supply Lower Bracket.*

---

### *Action Item Information*

---

*Actionee(s): Corrado Gargiulo/INFN*

*Action Due Date: 9/30/2005*

*Action: Assess TTCB integration procedures against SCL Warm Valve Box and TRD Gas Supply Lower Bracket.*

*Action Status:*

---

## *Open Action Items Report*

---

*Open Item Number: 05-063*

*RID Open Date: 9/16/2005*

*Title: Updated TTCB Design*

*Initiator(s):*

*Description: Thermal groups need to review TTCB design for potential issues.*

---

### *Action Item Information*

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*Actionee(s): Christian Vettore/CGS*

*Action Due Date: 9/30/2005*

*Action: Thermal groups need to review TTCB design for potential issues.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-064*

*RID Open Date: 9/16/2005*

*Title: TTCS Tube Routing*

*Intiator(s):*

*Description: Determine routing locations for TTCS tubes.*

---

### *Action Item Information*

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*Actionee(s): Robert Becker/MIT*

*Action Due Date: 9/30/2005*

*Action: Determine general routing locations for TTCS tubes.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number:* 05-065

*RID Open Date:* 9/16/2005

*Title:* TTCS Tube Routing

*Intiator(s):*

*Description:* Determine routing locations for TTCS tubes.

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### *Action Item Information*

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*Actionee(s):* Antonio Alvino/INFN, Gerrit Van Donk/NLR

*Action Due Date:* 10/31/2005

*Action:* Upon completion of 05-064, develop detailed TTCS tubing design.

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-066*

*RID Open Date: 9/16/2005*

*Title: MLI Mounting Locations*

*Intiator(s):*

*Description: Determine mounting locations for VC MLI in the areas where TTCS tubes will be routed.*

### *Action Item Information*

*Actionee(s): Bruce Sommer/ESCG, Craig Clark/ESCG*

*Action Due Date: 10/15/2005*

*Action: Provide list of mounting locations taken up by MLI mounts to NLR to support TTCS tube routing design.*

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-067*

*RID Open Date: 9/16/2005*

*Title: TTCS Tube Relative Displacements*

*Intiator(s):*

*Description: Provide relative displacements for TTCS tube routing areas.*

---

### *Action Item Information*

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*Actionee(s): Bruce Sommer/ESCG*

*Action Due Date: 9/16/2005*

*Action: Provide relative displacements for TTCS tube routing areas.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number:* 05-068

*RID Open Date:* 9/16/2005

*Title:* Tracker Radiator Integration Jig

*Intiator(s):*

*Description:* Provide design for Tracker Raditor Integration Jig.

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### *Action Item Information*

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*Actionee(s):* Zhenhui He/SYSU

*Action Due Date:* 10/31/2005

*Action:* Provide design for Tracker Raditor Integration Jig.

*Action Status:*

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## *Open Action Items Report*

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*Open Item Number: 05-069*

*RID Open Date: 9/16/2005*

*Title: Thermal Tubing Support Beam*

*Intiator(s):*

*Description: Thermal Tubing Support Beam needs to be assessed for possible interferences with other hardware.*

---

### *Action Item Information*

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*Actionee(s): Stephen Harrison/SCL*

*Action Due Date: 9/30/2005*

*Action: Assess support beam violations into magnet Keep Out Zone.*

*Action Status:*

---

## *Open Action Items Report*

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*Open Item Number: 05-070*

*RID Open Date: 9/16/2005*

*Title: Thermal Tubing Support Beam Mass*

*Intiator(s):*

*Description: Mass of Thermal Support Beam needs to be calculated and tracked.*

---

### *Action Item Information*

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*Actionee(s): Robert Becker/MIT*

*Action Due Date: 10/31/2005*

*Action: Estimate total weight of support beam and a reasonable division of the total mass between the Cryocooler and TTCS mass budgets.*

*Action Status:*

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## Open Action Items Report

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**Open Item Number:** AMS\_02-CDR-06

**RID Open Date:** 5/1/2003

**Title:** AMS-CDR-1-17: Meteoroid/Orbital Debris Shielding

**Intiator(s):** E. Christiansen/NASA

**Description:** *Shielding from meteoroid/debris impact is inadequate to meet protection requirements. Shielding of pressurized vessels on AMS-02 such as the vacuum case and TRD (as well as any other pressure vessel) is required to prevent catastrophic rupture of these tanks in the event of meteoroid/debris impact which would release high-velocity fragments creating a potentially serious safety issue for on-board crew. The assessed probability of no penetration (PNP) using specified environment models is 0.97 which is far below the specified 0.997 PNP requirement. Updating ballistic limit equations and models as described in the forward work plan does not appear adequate to show compliance with requirements. Additional or significantly enhanced shielding will likely be necessary to meet safety requirements.*

---

### Action Item Information

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**Actionee(s):** Dana Lear/ESCG

**Action Due Date:** 7/1/2006

**Action:** *Complete analysis and coordinate design of debris shields. To be completed by Phase III Safety.*

**Action Status:** *05/03/05 - Email from Dana Lear/ESCG to Phil Mott/ESCG, Ross Harold/ESCG, and Trent Martin/EA2. The AMS-02 modeling for the MMOD assessment was completed last week. Additionally, the BUMPER geometry runs have been completed. Since the input scripts have not been run in years, I'm going through and verifying/updating all inputs for both the shield ballistic response definitions (BLEs) and the mission parameters.*

*02/09/05 - Chris Tutt/ESCG sent an email to Dana Lear/ESCG requesting a letter from Eric Christiansen/KX with the requirements and his signature.*

*01/19/05 - L. Hill/LMSO to get in touch with D. Lear/LMSO to discuss what L. Hill/LMSO needs for Phase II. C. Tutt/LMSO, P. Mott/LMSO, & R. Harold/LMSO need to be involved. T. Martin/EA stated that anything pressure safety critical needs to be covered.*

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-CDR-08

**RID Open Date:** 5/1/2003

**Title:** Shear Analysis of Items in Enlarged Holes

**Intiator(s):** B. Ritter/GSFC

**Description:** Bolts attaching the support ring to the conical flange were assumed to transfer shear, even though they are in sloppy holes this is non-conservative.

---

### *Action Item Information*

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**Actionee(s):** Chris Tutt/ESCG

**Action Due Date:** 7/31/2005

**Action:** Work with SWG to resolve concerns with compliance with NASA-STD-08307, including bolts in sloppy holes being assumed to take shear.

**Action Status:** 8/15/2005 - Analysis currently low priority. Bruce Sommer to review analyst workloads and estimate completion date.  
7/22/2005 - Initial VC flange loads obtained with latest model. These loads will be used in the updated analysis.  
6/17/2005 - SWG agrees that 08307 will only apply to safety critical fasteners.  
5/11/2005 - Resolution plan under development. Proposal complete but needs to be written up and approved by Structures Working Group (SWG).  
2/9/2005 - Action item due date was changed to May 31, 2005. Bolt analysis was done to Lockheed Martin standards. Structures Working Group (SWG) has new standards. Currently looking to see how many interfaces have issues and what needs to be done. Action item was changed from 'Work bolt concerns with the SWG.' to 'Work with SWG to resolve concerns with compliance with NASA-STD-08307, including bolts in sloppy holes being assumed to take shear.'

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-CDR-09

**RID Open Date:** 5/1/2003

**Title:** AMS-CDR-2-15: Missing Documents - Structural Analysis

**Intiator(s):** Murthy Pinnamaneni Structures/Boeing

**Description:** *The following items were not available in the Data Package: design load factors, dynamic analysis procedure and results. From 2.2.1, AMS Report Outline.doc, Magnetic Strap Analysis and the Coupled Loads Analysis, which are identified to be in "separate sections." Reports/documents that include: Dynamic Loads Analysis Description; Payload/Shuttle Interface Loads; Trunion Deflection; Trunion Misalignment Loads; and Uncertainty Factors Used in the Analysis.*

---

### *Action Item Information*

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**Actionee(s):** Chris Tutt/ESCG

**Action Due Date:** 7/1/2006

**Action:** *Update stress report and dynamics analyses reports. To be completed by Phase III Safety Data Pack.*

**Action Status:**

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-CDR-12

**RID Open Date:** 5/1/2003

**Title:** AMS-CDR-4-18: Presentation Issues

**Intiator(s):** H. Hoang/PEI  
J. Fu/PEO

**Description:** The presentation for avionics is not adequate for documentation purpose to show compliance with SSP 57003 requirements.

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### *Action Item Information*

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**Actionee(s):** Tim Urban/ESCG

**Action Due Date:** 3/31/2005

**Action:** Supply document listing EMI/electrical specs.

**Action Status:** 9/2/2005 - Urban has sent CR text to Boeing PEI Hoang. Review meeting is scheduled for the Tuesday, Sept. 6 (yes, 2005). After Boeing PEI concurrence, the CR will be submitted for both the Hardware / Station ICD and the PIH ICD.

8/22/2005 - Draft version of CR complete. Tim Urban attempting to get Henry Hoang's concurrence before it is released as a CR. Win Reid and Bob Miley to assist in arranging meeting.

6/29/2005 - Tim Urban/ESCG to update PIH ICD based on Henry Hoang's inputs. Update due 8/22, to be released as a CR.

2/09/2005 - Try to get initiator's approval to merge this CDR action item with AMS-CDR-4-20 (OPMT action item AMS\_02-CDR-13 by next CCB. Action item due date was changed to March 31, 2005.

1/05/2005 - Paul Nemeth/LMSO to ask initiator if this RID can be rolled into RID AMS-CDR-4-18 and Open Action Item AMS\_02-CDR-13.

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-CDR-13

**RID Open Date:** 5/1/2003

**Title:** AMS-CDR-4-20: Power Compatibility and EMC Testing

**Intiator(s):** H. Hoang/PEI  
J. Fu/PEO

**Description:** The EME Control Plan (or equivalent) used to establish the plan for how AMS will be compatible with the ISS EMI requirements is lacking in the CDR package.

---

### *Action Item Information*

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**Actionee(s):** Tim Urban/ESCG

**Action Due Date:** 3/31/2005

**Action:** Supply EME control plan.

**Action Status:** 8/22/2005 - Draft version of CR complete. Tim Urban attempting to get Henry Hoang's concurrence before it is released as a CR. Win Reid and Bob Miley to assist in arrangjng meeting.  
6/29/2005 - Tim Urban/ESCG to update PIH ICD based on Henry Hoang's inputs. Update due 8/22, to be released as a CR.  
2/09/2005 - Try to get initiator's approval to merge this CDR action item with AMS-CDR-1-18 (OPMT action item AMS\_02-CDR-12 by next CCB. Action item due date was changed to March 31, 2005.  
1/05/2005 - Tim Urban/LMSO to provide status March 2005.

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## *Open Action Items Report*

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*Open Item Number:* AMS\_02-PDS\_CDR-06

*RID Open Date:* 4/18/2005

*Title:*

*Intiator(s):* Tim Urban

*Description:*

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### *Action Item Information*

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*Actionee(s):* M. Cova

*Action Due Date:* 10/15/2005

*Action:* Re-evaluate thermal optical properties on the top of the PDS as there are no longer heaters located there (breakdown of MLI vs. white paint). QM & FM different ?

*Action Status:* 8/2/2005 - Awaiting thermal analysis of revised worst hot case.

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## *Open Action Items Report*

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*Open Item Number:* AMS\_02-PDS\_CDR-08

*RID Open Date:* 4/18/2005

*Title:*

*Intiator(s):* Tim Urban

*Description:*

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### *Action Item Information*

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*Actionee(s):* S. Alia

*Action Due Date:* 5/16/2005

*Action:* Add 0.03  $\mu$ F per 3.2.2.2.A of SSP 57003, and add verification by design inspection or test.

*Action Status:* 8/22/2005 - CGS proposes release of updated document by 9/19.

8/15/2005 - Tim Urban to contact Sergio Alia and resolve remaining concerns. Closure expected by 9/5.

---

## *Open Action Items Report*

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*Open Item Number:* AMS\_02-PDS\_CDR-09-2

*RID Open Date:* 4/18/2005

*Title:*

*Intiator(s):* Tim Urban

*Description:*

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### *Action Item Information*

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*Actionee(s):* S. Alia

*Action Due Date:* 5/16/2005

*Action:* Update document for maximum operating temperature of 51°C (Section 3.2, requirement ID PDS-ENV-3).

*Action Status:* 8/22/2005 - CGS proposes release of updated document by 9/19.  
8/2/2005 - MOT should be changed to match updated worst case hot temperature.

---

## Open Action Items Report

---

**Open Item Number:** AMS\_02-Thermal\_CDR-03

**RID Open Date:** 4/4/2005

**Title:** Design Pressures Based on Operational Temperature

**Intiator(s):** Chris Tutt/ESCG

**Description:** In each specification, the requirement states “The LHP shall be designed for an internal Maximum Operating Pressure which is equal to the vapour pressure of the working fluid at Maximum Operating Temperature.” The LHP should instead be designed to survive the Maximum Design Pressure, which will be the larger of either the pressure of the working fluid at the maximum survival temperature or, for those LHPs using ammonia as the working fluid, the maximum pressure that could occur in a trapped volume if the ammonia were to freeze and undergo local thawing.

---

### Action Item Information

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**Actionee(s):** M. Molina/CGS

**Action Due Date:** 6/15/2005

**Action:** Replace Maximum Operating Pressure with Maximum Design Pressure and change description of required calculations to match.

**Action Status:** 8/10/2005 - CGS proposed 9/30 for release of updated documents.  
8/9/2005 - Craig Clark, Chris Tutt, and Leland Hill met to review analysis requirements. JS to do initial fault screening analysis based on information currently available in house. Craig to confirm with Marco Molina that we have latest data available. Analysis of certain systems (CAB, PDS, etc) on hold pending finalization of design.  
8/3/2005 - Issue reviewed at TWG and MDP calculation assumptions defined for each pressure system. Maximum design temperatures provided by CGS 8/3. MDP calculations in work, but clearly heater circuits will be safety critical.  
5/25/2005 - Leland Hill working this issue with Reinhard Schlitt. MDP calculation under review.

---

## *Open Action Items Report*

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**Open Item Number:** *AMS\_02-Thermal\_CDR-06*

**RID Open Date:** *4/4/2005*

**Title:** *CAB MLI Discrepancy*

**Intiator(s):** *Chris Tutt/ESCG*

**Description:** *DISCREPANCY*

*Section 3.3 of the CAB LHP Freezing Assessment states that MLI is needed over the cylindrical spring section of the LHP and the section running across the top of the CAB. These areas do not appear to be covered by MLI based on the description in the CAB section of the MLI document.*

### *SUGGESTED SOLUTION*

*Add drawing to MLI description showing where CAB MLI is located relative to the CAB LHP. Add MLI to cover required sections of CAB LHP if not currently present.*

### *SUPPLIER'S RESPONSE*

*We' ll do that as the CAB TCS design is completed.*

---

### *Action Item Information*

---

**Actionee(s):** *Marco Molina/CGS*

**Action Due Date:** *6/15/2005*

**Action:** *Add drawing to MLI description showing where CAB MLI is located relative to the CAB LHP. Add MLI to cover required sections of CAB LHP if not currently present.*

**Action Status:** *8/3/2005 - Final MLI design on hold pending final CAB analysis - scheduled for closure on 9/15.*

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-Thermal\_CDR-15

**RID Open Date:** 4/4/2005

**Title:** Inconsistent NAS1351 Bolt Yield Strengths

**Intiator(s):** Bruce Sommer/ESCG

**Description:** DISCREPANCY

*Yield strength for NAS1351 bolts in OHB report is not the same as the yield strength for the same fastener type in the CGS report. This is consistent for all OHB v.s. CGS reports.*

*Bolt NAS1351*

*OHB Yield Allowable 950 MPa (138 ksi)*

*CGS Yield Allowable 827 MPa (120 ksi)*

---

### *Action Item Information*

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**Actionee(s):** Marco Molina/CGS

**Action Due Date:** 6/15/2005

**Action:** *Find the documentation that verifies the yield strength of the fastener and update all reports to include the same allowable for the same bolt type.*

**Action Status:** *8/10/2005 - CGS proposes test data would be available to SWG by ATP+2 months. The final analysis report would be available 2.5 months after written acceptance by SWG.*

*5/06/2005 - Updated document received and is under review.*

*4/25/2005 - Procurement specifications FFS86E for NAS1351 fasteners was sent to CGS and OHB on 04/25/05. Page 7 of the document shows a minimum yield strength for these bolts is 120 ksi.*

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-Thermal\_CDR-17

**RID Open Date:** 4/7/2005

**Title:** *Insert test and its applicability to different size of insert*

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY

*Three inserts, with size 3 fastener and face sheet of material 2024, were tested. The requirement to test 12 more insert has been planned. The upcoming test will use 6061 material face sheet. Also, there are two types of inserts, namely size 3 and size 4. The test result based on size 3 and 2024 will be deemed applicable to size 4 and 6061. Rationale has to be provided to make this jump of application.*

---

### *Action Item Information*

---

**Actionee(s):** Marco Molina/CGS

**Action Due Date:** 6/15/2005

**Action:** *Test result has to be presented and rationale given for the test applicability to cover size 4 insert and different face sheet material 6061. Test proposal end of April. Perform test ASAP*

**Action Status:** 8/8/2005 - CGS proposes ATP+2 months as projected test date.

---

## *Open Action Items Report*

---

**Open Item Number:** *AMS\_02-Thermal\_CDR-56*

**RID Open Date:** *4/4/2005*

**Title:** *CAB Heaters*

**Intiator(s):** *Craig Clark/ESCG*

**Description:** *DISCREPANCY  
CAB heaters are not defined.*

*SUGGESTED SOLUTION  
Provide design details for CAB heaters*

*SUPPLIER'S RESPONSE  
CAB design to be completed yet.  
Details to be provided after design completion.*

---

### *Action Item Information*

---

**Actionee(s):** *Christian Vettore/CGS*

**Action Due Date:** *8/1/2005*

**Action:** *Provide design details for CAB heaters.*

**Action Status:** *8/3/2005 - CGS provided updated CAB cold case temperatures to CRISA for heater sizing. Final design expected 9/15/2005. Actionee changed to Christian Vettore.  
6/5/2005 - Date changed to 8/1/2005 to allow for CAB model improvements.  
5/19/05 Heaters cannot be sized until CAB design is complete. On agenda for Madrid.*

---

## Open Action Items Report

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**Open Item Number:** AMS\_02-Thermal\_CDR-57

**RID Open Date:** 4/4/2005

**Title:** TRDGB heaters

**Intiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY

*Analysis of TRDGB heaters not provided.*

### SUGGESTED SOLUTION

*Provide analysis for TRDGB heaters*

### SUPPLIER'S RESPONSE

*Failure on analysis will be done by TRDGB thrmal responsible.*

---

### Action Item Information

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**Actionee(s):** Ulrich Becker/MIT, Martina Green/MIT

**Action Due Date:** 6/1/2005

**Action:** *Finalize TRD Gas Supply tank heater design, then analyze system to determine maximum design pressure which could occur after any two faults in the safety circuit. Once that MDP is available, confirm that tank burst pressure and LBB analysis still meet requirements.*

**Action Status:** 8/22/2005 - Actionees changed to Ulrich Becker and Martina Green.

8/15/2005 - Trent Martin, Paul Nemeth, and Craig Clark to meet with Ulrich Becker and discuss analysis plan.

8/3/2005 - Craig Clark to get contract status from Ulrich Becker to quell disquieting rumors.

5/19/05 - Analysis is on hold pending signed contract between JS and ETH/MIT.

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## *Open Action Items Report*

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**Open Item Number:** *AMS\_02-Thermal\_CDR-60*

**RID Open Date:** *4/4/2005*

**Title:** *Crate radiator heaters*

**Intiator(s):** *Craig Clark/ESCG*

**Description:** *DISCREPANCY:  
Crate radiator heaters are not defined.*

*SUGGESTED SOLUTION  
Provide details for crate radiator heaters.*

---

### *Action Item Information*

---

**Actionee(s):** *Christian Vettore/CGS*

**Action Due Date:** *8/15/2005*

**Action:** *Provide PDS heater design allowing box to warmed to switch-on temperature with only one power feed at arm voltage levels.*

**Action Status:** *8/22/2005 - Tim Urban to contact Russ Long and get appropriate technical point of contact at MDR.  
8/10/2005 - CGS proposes 9/30 as release date for updated heater documents.  
8/8/2005 - Bob Miley/OZ to identify technical POC for 1800W requirement.  
5/27/2005 - Heater details provided, but warming the PDS was found to require both A&B power feeds.  
Only one feed will be available while on the arm. CGS to work issue.*

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-Thermal\_CDR-68

**RID Open Date:** 4/4/2005

**Title:** TRD Attitudes

**Intiator(s):** Craig Clark/ESCG

**Description:** TRD was only analyzed in 2 ISS attitudes, both at beta=+75. This is not enough to determine if all requirements are met.

---

### *Action Item Information*

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**Actionee(s):** R. Schlitt/OHB, C. Clark/ESCG

**Action Due Date:** 6/15/2005

**Action:** Analyze TRD for the entire range of ISS attitudes and beta angles. Also all STS free flying, docked on ISS, and handoff cases.

**Action Status:** 8/15/2005 - New thermal cases identified and provided to CGS. CGS gathering thermal data at TRD interfaces and providing that information to OHB. OHB will then update their analysis using new temperature data. CGS expects to deliver interface data by 9/5, OHB tentatively expected to deliver new results on 9/22.  
8/3/2005 - Initial TRD results presented at TWG look promising, but some model refinements were identified.  
6/5/1005 - TRD thermal model to be increased to 15 nodes. Still to be verified whether 15 nodes will be sufficient.  
5/19/2005 - OHB will perform analyses considering all attitudes and transients. This will be done after a TVT test and subsequent TRD model update.

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## Open Action Items Report

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**Open Item Number:** AMS\_02-Thermal\_CDR-82

**RID Open Date:** 4/4/2005

**Title:** CAB Heater Schematic

**Intiator(s):** Mike Capell/AMS

**Description:** DISCREPANCY

*Looking at Fig 4-2, pg 20, I see that the thermostats for the CAB are both placed on the return line from the heaters. Is there a reason for this ? Usually we have been placing the first one on the return line and the second one on the input line because we understood this was the "normal practice". I don't think it makes much difference - but we should stick to one way or the other, no ?*

**SUGGESTED SOLUTION**

*Need comments*

**SUPPLIER'S RESPONSE**

*Will be fixed*

---

### Action Item Information

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**Actionee(s):** Marco Molina/CGS

**Action Due Date:** 8/1/2005

**Action:** Figure needs to be fixed.

**Action Status:** 8/10/2005 - CGS proposes completion of CAB design + 1 month for formal release date of updated heater doucment. This would currently correspond to 10/15.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-01

**RID Open Date:** 4/4/2005

**Title:** Detail Finite element model for the thermal bar and other related structures not available for review

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

*Detail finite element model for the thermal bar and other related structures is not presented in detail in the subject document for review. In addition, how the finite element model is constrained is not presented.*

**SUGGESTED SOLUTION:**

*Provide detail finite element model for review. If CAD model is available for the evaporator assembly, S&M (structures & Mechanism) would also like to review it.*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** Provide detailed finite element model for review.

**Action Status:** 9/9/2005 - NLR proposes changing actionee on this RID to Tracker group. Exact actionee TBD.

8/29/2005 - All TTCS actions are on agenda for TWG meeting in Emmeloord.

8/8/2005 - Bruce Sommer to contact Johannes Van Es and get status on this and all subsequent TTCS actions.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-02

**RID Open Date:** 4/4/2005

**Title:** Thermal bars frequency analysis

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

1. There is no figure 11, as mentioned.
2. When TPG material is neglected, the first mode shown is to be 80 hz which is close to a test result of 84 hz. However, when the TPG material is not neglected, the comparable analytical mode (second mode at 152 hz) is much higher than the test result.

**SUGGESTED SOLUTION:**

*Explanation of the discrepancy.*

---

### *Action Item Information*

---

**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide explanation of the discrepancy and/or update document.

**Action Status:** 9/9/2005 - Bart Verlaat/NIKHEF to provide detailed drawings of surrounding structure to APO. Typo to be corrected in next release of document.

8/15/2005 - Bruce Sommer to contact Divac Rapin and try to work the issue through the Tracker group instead of the TTCS group.

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-03

**RID Open Date:** 4/4/2005

**Title:** Evaporator tail need a redesign

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

1. At the time of this delta CDR, section 6 still indicates a need for evaporator tail redesign due to large deformation. The large deformation is caused by evacuated vacuum case before launch.

**SUGGESTED SOLUTION:**

Need to present the evaporator tail redesign as soon as possible.

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide evaporator redesign details.

**Action Status:** 9/9/2005 - New design to be presented at CDR.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-04

**RID Open Date:** 4/4/2005

**Title:** Thermal Bar Frequency Analysis

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

*frequency analysis was done for each components. This approach is fine as long as each component is isolated to each other. However, there is no clear justification for this.*

**SUGGESTED SOLUTION:**

*Present rationale for doing frequency analysis for each component.*

*Or perform analysis for the complete evaporator assembly.*

---

### *Action Item Information*

---

**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** *NLR to present rationale for doing frequency analysis for each component or perform analysis of complete assembly.*

**Action Status:** *9/9/2005 - NLR states that frequency analysis was done by parts for contractual reasons. Bart Verlaat/NIKHEF to provide detailed drawings of surrounding structure.*

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-05

**RID Open Date:** 4/4/2005

**Title:** *Incorrect Figure Title*

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** *DISCREPANCY:  
Figure 15 is mention in section 6. But there is no figure 15.*

**SUGGESTED SOLUTION:**  
*Correct the typo.*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** *NLR to correct typos in next release of document.*

**Action Status:** *9/9/2005 - Typo will be corrected in next release of document.*

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## *Open Action Items Report*

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*Open Item Number:* AMS\_02-TTCS\_PDR-06

*RID Open Date:* 4/4/2005

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*Title:* Installation deformation release

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*Intiator(s):* H. C. Lo/NASA-JSC

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*Description:* DISCREPANCY:

1. It is not clear how the assembly induced deformation is released after assembly. In one instance, it indicates that the 2mm deformation will be released. And in the other instance, it indicates that the 10 mm deformation is not acceptable and requires a evaporator tail redesign.
  
2. It is not clear how to measure the induced installation deformation. Or is there such a procedure to measure the installation deformation.

*SUGGESTED SOLUTION:*

1. Clarification required.
  
2. Implement a procedure to measure the installation deformation and set a range of acceptable installation deformation.

---

### *Action Item Information*

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*Actionee(s):* Johannes Van Es/NLR

*Action Due Date:* 7/15/2005

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*Action:* NLR to clarify requirement and provide detail on how deformation will be measured.

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*Action Status:*

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-07

**RID Open Date:** 4/4/2005

**Title:** Visual inspection of the weld and fracture analysis

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

1. Since visual inspection will be the inspection method for post-test verification, when perform fracture analysis, the minimum crack size has to be conforming to the inspection method.
2. Is there a structural analysis performed on the welds, including fracture analysis, as required?
3. Welding is performed at room temperature. During operation, the weld will be at a much lower temperature. How do we guarantee that the weld will be performing at a much lower temperature, possibly due to residual stress?

**SUGGESTED SOLUTION:**

Present strength and fracture analysis.

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide strength and fracture analysis

**Action Status:** 9/9/2005 - Weld structural and fracture analysis to be presented at TTCS CDR. NLR to coordinate requirements with Dan Rybicki.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-08

**RID Open Date:** 4/4/2005

**Title:** Leak integrity test still TBD

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:  
Leak Integrity test still is listed as TBD.

**SUGGESTED SOLUTION:**  
Establish leak integrity test procedure as soon as possible.

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide leak integrity test procedure

**Action Status:** 9/9/2005 - Leak integrity test procedure to be presented at CDR.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-09

**RID Open Date:** 4/4/2005

**Title:** TTCS tube routing

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

*TTCS tube routing goes along the strut into Ram and Wake radiator. Since RAM and WAKE radiator is a much flexible structure, thus it is subjected to a large deformation and deflection. How the TTCS tube routing is attached to the strut is not clear. How the TTCS tube is attached to the strut and how it is routed into the radiator can affect the stress in the tube.*

**SUGGESTED SOLUTION:**

*Present detail information about the TTCS tube routing into RAM and WAKE radiator for review.*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide details of TTCS tube routing

**Action Status:** 9/9/2005 - Tube routing details to be presented at TTCS CDR.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-10

**RID Open Date:** 4/4/2005

**Title:** Negative safety margin

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

*Negative safety margins are shown in the analysis. Though the analysis is stated as rough analysis since detail information on components at this time is still not available, suggested remedy was not presented. Or different analysis approach is not attempted.*

**SUGGESTED SOLUTION:**

*Since this is a delta CDR, remedy for negative safety margin should be provided. The remedy can be re-design of the base plate/fasteners. Or the analysis can be re-done with different approach to show a positive safety margin. Leaving negative safety margin as presented is not desirable.*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide remedy for any negative margins of safety presented at PDR.

**Action Status:** 9/9/2005 - Updated analysis will be presented at TTCS CDR.

---

## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-11

**RID Open Date:** 4/4/2005

**Title:** Bolt and insert analysis

**Intiator(s):** H. C. Lo/NASA-JSC

**Description:** DISCREPANCY:

1. how the bolt analysis is done is not presented in the subject document.
2. bolt and insert technical information is not presented in the document.
3. it is not clear that pre-load is considered in the bolt in the analysis.

**SUGGESTED SOLUTION:**

*Provide information and specification on bolts and inserts used.*

*Provide bolt and insert detail analysis, including applicable document for bolt analysis and demonstrate that bolt analysis is compliant with the applicable document.*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide bolt details and analysis for TTCS box.

**Action Status:** 9/9/2005 - Details to be provided at TTCS CDR.

---

## *Open Action Items Report*

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**Open Item Number:** *AMS\_02-TTCS\_PDR-12*

**RID Open Date:** *4/4/2005*

**Title:** *Finite element analysis approach and fastener analysis*

**Intiator(s):** *H. C. Lo/NASA-JSC*

**Description:** *DISCREPANCY:*

- 1. "All box masses (including inside components) are modelled as uniformly distributed over the baseplate top face..." The box itself is not connected to the base plate. And the box has its own fastening point with USS. This assumption can be in error.*
- 2. components/baseplate interface are connected with fasteners. It appears that there is no information on these. As such, no analysis on these fasteners.*
- 3. No analysis provided on components within TTCB.*

**SUGGESTED SOLUTION:**

*Provide information when available.*

*Re-do analysis as appropriate.*

*The components inside TTCB has to be defined as soon as possible.*

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### *Action Item Information*

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**Actionee(s):** *Johannes Van Es/NLR*

**Action Due Date:** *7/15/2005*

**Action:** *NLR to provide design detail and finite element analysis of TTCB components.*

**Action Status:** *9/8/2005 - Analysis to be provided at TTCS CDR.*

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-14

**RID Open Date:** 4/4/2005

**Title:** TTCS fluid

**Intiator(s):** Klaus Luebelsmeyer

**Description:** DISCREPANCY:  
Using CO2 puts severe issues about freezing

**SUGGESTED SOLUTION:**  
Investigate impact of using alternative fluids with lower melting point, like propylene.

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to investigate alternatives to CO2 to avoid freezing.

**Action Status:** 8/8/2005 - NO2 has been identified as possible alternative - it has a much lower freezing point but has worse performance. Final decision on fluid on hold pending resolution of various design and analysis issues.

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## *Open Action Items Report*

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*Open Item Number: AMS\_02-TTCS\_PDR-15*

*RID Open Date: 4/4/2005*

*Title: OUT-OF-DATE informations*

*Intiator(s): Mike Capell/AMS*

*Description: DISCREPANCY:*

*The electronics description in the Pump requirements document (24 Jan 2005) is extravagantly out-of-date.*

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### *Action Item Information*

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*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 7/15/2005*

*Action: NLR to update Pump requirements Document*

*Action Status:*

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-16

**RID Open Date:** 4/4/2005

**Title:** DTS missing

**Intiator(s):** Mike Capell/AMS

**Description:** DISCREPANCY:

*Just looking at your figure 3-1 (Primary loop schematic), I was wondering that you don't measure the temperature on the return line from the tracker. Then I realized these are not needed as they are measured by the DTS within the tracker volume. Maybe this should be indicated somehow.....*

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to provide description TTCS temperature measurement.

**Action Status:**

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-17

**RID Open Date:** 4/4/2005

**Title:** Welding on Magnet

**Intiator(s):** Mike Capell/AMS

**Description:** DISCREPANCY:

Ref your remark 2, pg 9, welding on the magnet is "impossible". I would say this is not the case. I would say it is to be avoided if possible.

---

### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/15/2005

**Action:** NLR to update document as suggested in next release.

**Action Status:**

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## *Open Action Items Report*

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***Open Item Number:*** AMS\_02-TTCS\_PDR-18

***RID Open Date:*** 4/4/2005

***Title:*** Heaters Wiring

***Intiator(s):*** Mike Capell/AMS

***Description:*** DISCREPANCY:

*Ref Table 3-2, pg 14, it mentions the survival heaters tracker radiators are connected to the TTPD A-side and B-side. Of course they are connected to the PDS A-Side and B-side.*

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### *Action Item Information*

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***Actionee(s):*** Johannes Van Es/NLR

***Action Due Date:*** 7/15/2005

***Action:*** NLR to update document as suggested in next release

***Action Status:***

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## *Open Action Items Report*

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*Open Item Number: AMS\_02-TTCS\_PDR-19*

*RID Open Date: 4/4/2005*

*Title: TTCrate location*

*Intiator(s): Mike Capell/AMS*

*Description: DISCREPANCY:*

*Ref Fig 3-8, pg 16, TTCE location is shown incorrectly. It is on the bottom crate row. See attached CGS dwg. Of course I call it the TT-Crate. Of course the TTPD is still in the location indicated,*

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### *Action Item Information*

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*Actionee(s): Johannes Van Es/NLR*

*Action Due Date: 7/15/2005*

*Action: NLR to update document as suggested in next release*

*Action Status:*

---

## *Open Action Items Report*

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**Open Item Number:** *AMS\_02-TTCS\_PDR-20*

**RID Open Date:** *4/4/2005*

**Title:** *Modes Missing*

**Intiator(s):** *Mike Capell/AMS*

**Description:** *DISCREPANCY:*

*Usually a document like this contains a table summarizing the first N modes (their frequency and effective mass).*

*It is not noted that this is being/has been performed, just a few pictures (Fig 17,18,19) are included without reference.*

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### *Action Item Information*

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**Actionee(s):** *Johannes Van Es/NLR*

**Action Due Date:** *7/15/2005*

**Action:** *NLR to provide more details in the structural analysis report.*

**Action Status:**

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-23

**RID Open Date:** 4/4/2005

**Title:** Missing Analysis

**Initiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY:  
No analysis results were provided for Tracker or TTCS

**SUGGESTED SOLUTION:**  
Provide analysis results

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### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 7/31/2005

**Action:** NLR to provide temperature results for Tracker internals and TTCS system.

**Action Status:**

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-25

**RID Open Date:** 4/4/2005

**Title:** TTCS Heater Controls

**Intiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY:

*TTCS heater controls and interlocks are not well defined. Heaters that are not two-fault tolerant need to be shown by analysis not to cause a safety problem.*

*Start-up heaters on tubing currently have no thermostats.*

**SUGGESTED SOLUTION:**

*Provide details for TTCS heater control (computer control, thermostats, etc). Show that all heaters are two-fault tolerant or show by analysis that a failed on heater will not cause a safety problem.*

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### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 6/30/2005

**Action:** NLR to provide details of Line heaters, including interlocks and failure analysis.

**Action Status:** 8/3/2005 - Heaters will clearly be safety critical, so Craig Clark and Leland Hill to define required safety verifications.

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-26-1

**RID Open Date:** 4/4/2005

**Title:** TTCS Manifold Attachment

**Intiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY:

*The Upper Vacuum Case Joints may not be suitable for mounting the TTCS manifolds due to undesirable temperature extremes. This is critical to avoid CO2 freezing in the manifolds.*

**SUGGESTED SOLUTION:**

*Results of integrated thermal analysis need to be reviewed and a suitable mounting location identified.*

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### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR  
Marco Molina/CGS

**Action Due Date:** 6/15/2005

**Action:** NLR to work with CGS and NASA/ESCG to identify possible locations for mounting TTCS manifolds.

**Action Status:** 8/15/2005 - Bala doing fracture analysis on manifold pipes. Bala, Leland, Craig, and Chris to meet with both fracture and pressure systems team on PSRP and review proposed plan.

8/3/2005 - Preliminary thermal analysis shows that proposed manifold locations are marginal at best. Reviews of the rest of the structure for other locations are underway, but it is not clear that any location exists that will meet freezing requirements. Craig Clark to arrange meeting with safety community and discuss options.

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-26-2

**RID Open Date:** 4/4/2005

**Title:** TTCS Manifold Attachment

**Intiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY:

*The Upper Vacuum Case Joints may not be suitable for mounting the TTCS manifolds due to undesirable temperature extremes. This is critical to avoid CO2 freezing in the manifolds.*

**SUGGESTED SOLUTION:**

*Results of integrated thermal analysis need to be reviewed and a suitable mounting location identified.*

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### *Action Item Information*

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**Actionee(s):** Marco Molina/CGS

**Action Due Date:** 7/15/2005

**Action:** CGS to provide interface temperatures at proposed locations defined in OPMT item AMS\_02-TTCS\_PDR-26-1.

**Action Status:** 8/8/2005 - Craig Clark to send out latest thermal analysis results to NLR for review. NLR requested to provide latest pressure data to allow accurate calculation of CO2 freezing point.

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## *Open Action Items Report*

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**Open Item Number:** AMS\_02-TTCS\_PDR-27

**RID Open Date:** 4/4/2005

**Title:** TTCS Thawing

**Intiator(s):** Craig Clark/ESCG

**Description:** DISCREPANCY:

*After an extended loss of power the CO2 in the radiator may freeze and the freezing will propagate along the tube, stopping before it get to the manifolds. Heaters will be used to first thaw the lines from the manifold end. After tubes are thawed, radiator heaters will be turned on. A safety problem may exist if radiator heaters are turned on before manifold lines are thawed. Heaters are controlled from ground command via the TTCE. There are currently no interlocks to prevent the radiator heaters turning on before the lines are thawed.*

**SUGGESTED SOLUTION:**

*Determine if there is any possibility to make this thawing process two-fault tolerant. If not provide a description of the thawing process and operational constraints to assure no inadvertent thawing of the radiator. This will need to be accepted by the safety panel.*

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### *Action Item Information*

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**Actionee(s):** Johannes Van Es/NLR

**Action Due Date:** 6/30/2005

**Action:**

**Action Status:** 8/4/2005 - JS met with Glenn Ecord and Nick Martinez and identified an acceptance plan for certifying the current design. Bruce Sommer to summarize and send specific data requests with NLR.  
6/29/2005 - First test successful with no ruptures. NASA still waiting for test plans, test data, or any description of test results longer than two or three sentences.

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## *Open Action Items Report*

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*Open Item Number: UPS-CDR-01*

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s): Tim Urban/ESCG*

*Action Due Date: 8/26/2005*

*Action: Provide a complete set of mechanical drawings for the cell (interface and piece-parts) to CSIST*

*Action Status: 9/2/2005 - The drawings have been sent to CSIST. Drawing LP31757, Rev. A, are the revised hole locations that include relocating 5 holes due to obstructions in mounting the BMS electronics within the UPS. A request has been made of CSIST to determine if these present an integration problem.*

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## *Open Action Items Report*

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*Open Item Number:* UPS-CDR-02

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s):* Tim Urban/ESCG

*Action Due Date:* 8/26/2005

*Action:* Confirm that BMS board mounting screws have appropriate secondary locking feature.

*Action Status:* 9/2/2005 - The BMS mounting screws will have to be changed out to screws with integrated Mylar patch features. An E-mail to this effect has been sent to CSIST. Urban to get with Harold to have these screws added to the "Mylar patch" altered item drawing as a new dash number (ECD 09/09/2005). Urban to get with Fohey for procurement of these parts (ECD 09/16/2005).

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## *Open Action Items Report*

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**Open Item Number:** UPS-CDR-03

**RID Open Date:**

**Title:**

**Intiator(s):**

**Description:** CSIST's questions for Yardney:

- 1) In the electronics board, please confirm that wire W41 is tied to W82.
- 2) How is battery charge wire W42 connected to Cell 8? Will W42 be tied to W02?
- 3) Are 10 kOhm resistors incorporated on A10CON1.7 on the MCB? In the original design, W50 had a 10 kOhm resistor in series and went directly from the battery to J2.
- 4) 10 kOhm resistors are needed for W32-39. Are these resistors incorporated on A10CON1.18-25 on the MCB?

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### *Action Item Information*

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**Actionee(s):** Tim Urban/ESCG

**Action Due Date:** 8/16/2005

**Action:** Yardney to provide answers to four electrical questions posed by CSIST.

**Action Status:** 9/2/2005 - Questions E-mailed to Yardney on 08/23/2005. Asked for an ECD on 09/02/2005.

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## *Open Action Items Report*

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*Open Item Number: UPS-CDR-04*

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s): Tim Urban/ESCG*

*Action Due Date: 8/26/2005*

*Action: Provide BMS qualification test report.*

*Action Status: 9/2/2005 - Due to resistor problem on BMS boards, the delivery of BMS qualification test report may be delayed 3 ~ 12 weeks. Yardney is continuing to keep Urban informed.*

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## *Open Action Items Report*

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*Open Item Number: UPS-CDR-05*

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s): Tim Urban/ESCG*

*Action Due Date: 8/26/2005*

*Action: Determine why there is no thermal cycling in the battery acceptance screening test program.*

*Action Status: 9/2/2005 - The decision is to revert back to thermal cycle acceptance testing for the flight batteries, and based upon Judith's recommendation to change the flight battery thermal vacuum test to a vacuum leakage test. Thermal vacuum test WILL NOT be required for the flight battery acceptance testing. An E-mail was sent to JSC/EP - Jeevarajan, Yardeney - Gitzendanner, and CSIST - Ho for concurrence.*

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## *Open Action Items Report*

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*Open Item Number:* UPS-CDR-06

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s):* Tim Urban/ESCG

*Action Due Date:* 8/26/2005

*Action:* Determine if cold cycles and warm cycles can be perform consecutively to support CSIST chamber capability.

*Action Status:* 9/2/2005 - CSIST states that separate cold and hot chambers will be used for thermal environment tests, NOT thermal cycle testing. What is the difference between thermal environment tests and thermal cycle testing? Judith Jeevarajan explained that thermal environment tests are to measure performance whereas thermal cycling tests are to demonstrate survival when cycling through worst-case gradients.

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## *Open Action Items Report*

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*Open Item Number: UPS-CDR-07*

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s): Tim Urban/ESCG*

*Action Due Date: 8/26/2005*

*Action: Explain test requirement to perform a discharge at C/5 to 20.8 in Section 4.3 of the SOW.*

*Action Status: 9/2/2005 - CSIST still has a question regarding the discharge portion of the test with regards to the BMS operation and the overcharge state of the battery. Judith Jeevarajan has sent an email clarifying her position.*

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## *Open Action Items Report*

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*Open Item Number:* UPS-CDR-08

*RID Open Date:*

*Title:*

*Intiator(s):*

*Description:*

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### *Action Item Information*

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*Actionee(s):* Tim Urban/ESCG

*Action Due Date:* 8/26/2005

*Action:* Confirm whether current requirement in section 4.4.2 of the SOW can be changed from 85A to 70A.

*Action Status:* 9/2/2005 - CSIST states that the BMS solid state relay opens for battery currents higher than 70A, so a test current greater than this is not possible. Judith Jeevarajan clarified that test should be done to current higher than 70A to verify that relay does open at 70A.