

Herschel DoD Recovery
 File: H_CRP_SYS_DOD.xls
 Author: F. Keck



Procedure Summary

Objectives

This procedure follows the Survival Mode investigation and the decision which units shall be reconfigured back to nominal. This procedure will perform the unit reconfigurations (by RM and by manual commanding) and the transition to S/C Mode SAM. Following mode transitions depend on the target mode (usually back to the mode before SM occurred) and are handled by separate procedures.

Summary of Constraints

This procedure must be run in a pass with a ground station supporting TM/TC rate of 5k/4k. Before starting this procedure it must have been decided which units shall become the active/nominal ones.

Spacecraft Configuration

Start of Procedure

S/C Mode = SM
 TM/TC rate = 5k/4k
 ACMS Mode = SAM or SM
 All units in Survival Mode configuration.

End of Procedure

S/C Mode = SAM
 ACMS Mode = SAM or SM (as before)
 All units in the planned configuration.

Reference File(s)

Input Command Sequences

Output Command Sequences

HRVDOD

Referenced Displays

ANDs GRDs SLDs

Configuration Control Information

| DATE | FOP ISSUE | VERSION | MODIFICATION DESCRIPTION | AUTHOR | SPR REF |
|------------|-----------|---------|--------------------------------------------------------|---------|---------|
| 13/06/2008 | | 1 | Created | F. Keck | |
| 16/06/2008 | | 1.01 | Validation : Update | F. Keck | |
| 16/06/2008 | | 2 | Update | F. Keck | |
| 24/06/2008 | | 2.01 | Validation : TAS-F Input: Correction for RFDN switches | F. Keck | |
| 07/07/2008 | | 2.02 | Validation : Database update | F. Keck | |
| 08/07/2008 | 1 | 2.03 | Validation : Database update | F. Keck | |

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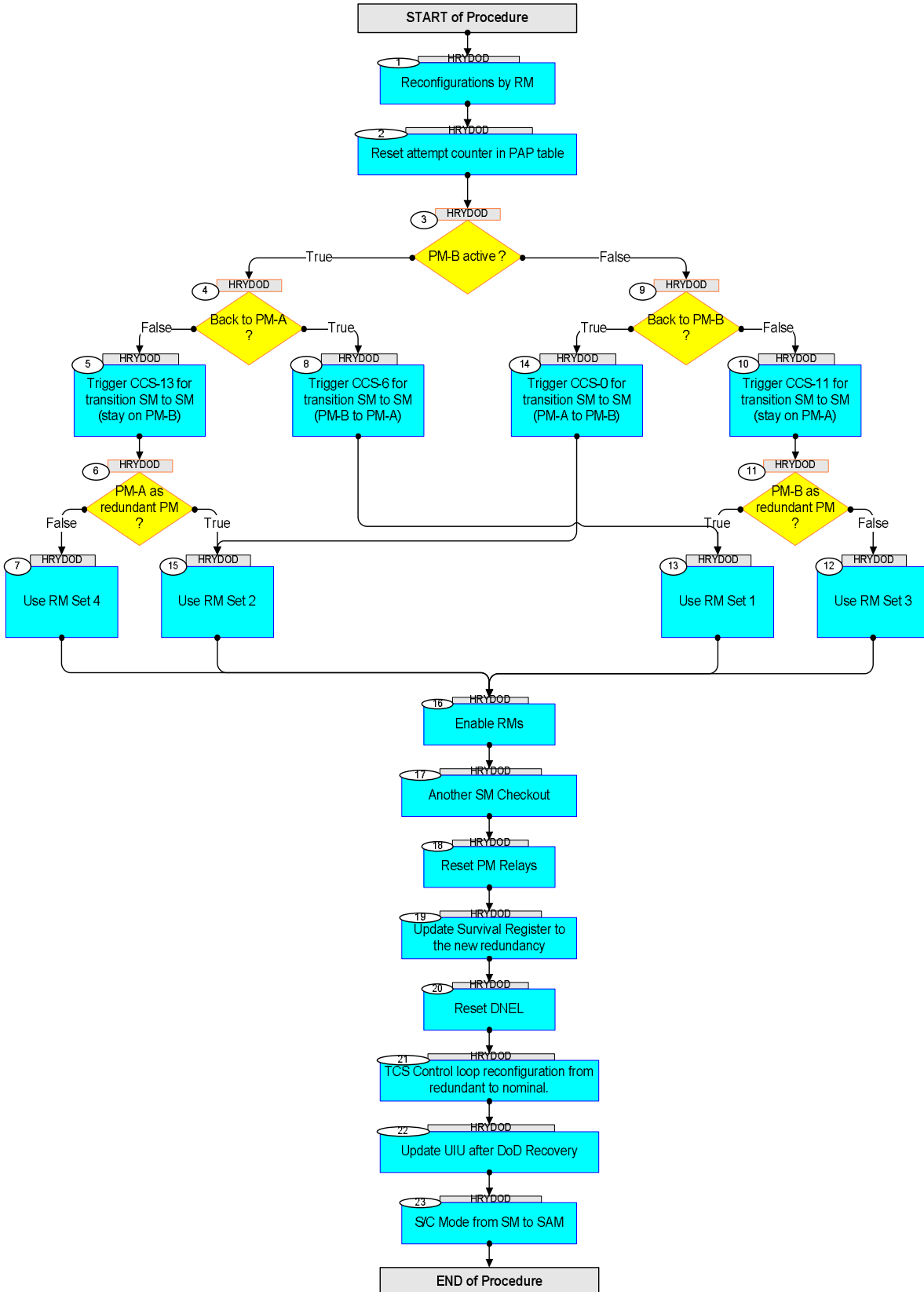


| | | | | | |
|------------|-----|------|-----------------------------------------------------------------------------------|---------|--|
| 22/12/2008 | | 2.04 | Validation : Update of procedure references | F. Keck | |
| 22/12/2008 | 2 | 2.05 | Validation : Update procedure references | F. Keck | |
| 02/03/2009 | 2.1 | 3 | Improving consistency with new reference procedures | F. Keck | |
| 18/02/2011 | | 4 | Procedure calls to H_CRP_DHS_3019 replaced by H_CRP_DHS_PAP_A and H_CRP_DHS_PAP_B | F. Keck | |
| 06/05/2011 | 3.1 | 5 | Minor corrections and clarifications after simulation. | F. Keck | |

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Procedure Flowchart Overview



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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
|----------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-----------------|
| Beginning of Procedure | | | | |
| <p><i>TC Seq. Name : HRYDOD (DoD Recovery)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p> | | | | |
| 1 | | Reconfigurations by RM | | Next Step: 2 |
| | | The RM based reconfiguration will affect following units: CDMU PM, TTC, RFDN, PCDU i/f, TTR Board, SDB and the Separation Status. All other units must be reconfigured manually afterwards. | | |
| | | Update the Survival Register for the planned RM triggered reconfiguration. To go back to the default nominal configuration: - TTC (Rx, Tx, TWTA, EPC) = 1 - RFDN Switches = BBBB - PCDU 1553 I/F = A - TRR Board = A - 1553 SDB = A - S/C separation status = Separated => SR = 00 01 01 78 78 00 00 | | |
| | | Execute Procedure: H_CRP_DHS_DODSR Survival register modif after DoD | | |
| | | Both RMs remain disabled until the SM to SM transition is performed. | | |
| 2 | | Reset attempt counter in PAP table | | Next Step: 3 |
| | | Attempt counter of PAP 0 must be reset on the RM that has triggered the SM. | | |
| | | Execute Procedure: H_CRP_DHS_ATT_A Reset PAP attempt counters on RM A | | |
| | | Execute Procedure: H_CRP_DHS_ATT_B Reset PAP attempt counters on RM B | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
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| 3 | | PM-B active ? | | Next Step: True 4 False 9 |
| 4 | | Back to PM-A ? | | Next Step: False 5 True 8 |
| 5 | | Trigger CCS-13 for transition SM to SM (stay on PM-B) | | Next Step: 6 |
| | | Execute Telecommand PAP0_DoD_PMB_Only TC Control Flags : Subsch. ID : 10 Det. descr. : PAP#0 DoD - (PMB Only) - High Priority Standard GBM IL DSE --Y -- --- | DCZBA159 | |
| | | Increase TM/TC rate | | |
| | | Execute Procedure: H_CRP_SYS_TMTC Increase TM/TC Rate after Mode Drop | | |
| 6 | | PM-A as redundant PM ? | | Next Step: False 7 True 15 |
| 7 | | Use RM Set 4 | | Next Step: 16 |
| | | If RM Set 4 is already in use, skip this step. | | |
| | | Execute Procedure: H_CRP_DHS_PAP_A Choose new PAP set for RM A | | |
| | | Execute Procedure: H_CRP_DHS_PAP_B Choose new PAP set for RM B | | |
| 8 | | Trigger CCS-6 for transition SM to SM (PM-B to PM-A) | | Next Step: 13 |
| | | Inform Ground Station about expected drop in TM/TC to 500/125. | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
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| | | Execute Telecommand <div style="text-align: right;">PAP0_DoD_PMB_Nom</div> TC Control Flags : <div style="text-align: right;">GBM IL DSE --Y -- ---</div> Subsch. ID : 10 Det. descr. : PAP#0 DoD - (PMB Nominal) - High Priority Standard | DCZB0159 | |
| | | Increase TM/TC rate | | |
| | | Execute Procedure: H_CRP_SYS_TMTC Increase TM/TC Rate after Mode Drop | | |
| 9 | | Back to PM-B ? | | Next Step: False 10 True 14 |
| 10 | | Trigger CCS-11 for transition SM to SM (stay on PM-A) | | Next Step: 11 |
| | | Execute Telecommand <div style="text-align: right;">PAP0_DoD_PMA_Only</div> TC Control Flags : <div style="text-align: right;">GBM IL DSE --Y -- ---</div> Subsch. ID : 10 Det. descr. : PAP#0 DoD - (PMA Only) - High Priority Standard | DCZAA159 | |
| | | Increase TM/TC rate | | |
| | | Execute Procedure: H_CRP_SYS_TMTC Increase TM/TC Rate after Mode Drop | | |
| 11 | | PM-B as redundant PM ? | | Next Step: False 12 True 13 |
| 12 | | Use RM Set 3 | | Next Step: 16 |
| | | If RM Set 3 is already in use, skip this step. | | |
| | | Execute Procedure: H_CRP_DHS_PAP_A Choose new PAP set for RM A | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
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| | | Execute Procedure: H_CRP_DHS_PAP_B Choose new PAP set for RM B | | |
| 13 | | Use RM Set 1 | | Next Step: 16 |
| | | If RM Set 1 is already in use, skip this step. | | |
| | | Execute Procedure: H_CRP_DHS_PAP_A Choose new PAP set for RM A | | |
| | | Execute Procedure: H_CRP_DHS_PAP_B Choose new PAP set for RM B | | |
| 14 | | Trigger CCS-0 for transition SM to SM (PM-A to PM-B) | | Next Step: 15 |
| | | Inform Ground Station about expected drop in TM/TC to 500/125. | | |
| | | Execute Telecommand PAP0_DoD_PMA_Nom TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10 Det. descr. : PAP#0 DoD - (PMA Nominal) - High Priority Standard | DCZA0159 | |
| | | Increase TM/TC rate | | |
| | | Execute Procedure: H_CRP_SYS_TMTC Increase TM/TC Rate after Mode Drop | | |
| 15 | | Use RM Set 2 | | Next Step: 16 |
| | | If RM Set 2 is already in use, skip this step. | | |
| | | Execute Procedure: H_CRP_DHS_PAP_A Choose new PAP set for RM A | | |

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| | | Execute Procedure: H_CRP_DHS_PAP_B Choose new PAP set for RM B | | |
| 16 | | Enable RMs | | Next Step: 17 |
| | | Enable both RMs again. | | |
| | | Execute Procedure: H_CRP_DHS_3011 Enable or disable Reconfiguration Module | | |
| 17 | | Another SM Checkout | | Next Step: 18 |
| | | No complete checkout is required; just check if the expected unit switchover was effective. | | |
| | | Execute Procedure: H_CRP_SYS_CHECK FDIR 3&4 Anomaly Checkout | | |
| 18 | | Reset PM Relays | | Next Step: 19 |
| | | Reset PM Relays on both PMs. | | |
| | | Execute Procedure: H_CRP_DHS_3015 Configuration of PM relay 0 and 1 | | |
| 19 | | Update Survival Register to the new redundancy | | Next Step: 20 |
| | | Update the survival register to define redundant units. The default redundancy is: - TTC (Rx, Tx, TWTA, EPC) = 2 - RFDN Switches = ABBB - PCDU 1553 I/F = B - TRR Board = B - 1553 SDB = B - S/C separation status = Separated => SR = 00 03 03 F7 F7 01 01 | | |

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| Step No. | Time | Activity/Remarks | TC/TLM | Display/ Branch |
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| | | Execute Procedure: H_FCP_DHS_1012 Write survival register after separation | | |
| 20 | | Reset DNEL | | Next Step: 21 |
| | | Execute Procedure: H_CRP_EPS_DNELR DNEL Reset | | |
| 21 | | TCS Control loop reconfiguration from redundant to nominal. | | Next Step: 22 |
| | | Execute Procedure: H_COP_TCS_CLRN Thermal Control loops Reconfiguration from Redundant to Nominal | | |
| 22 | | Update UIU after DoD Recovery | | Next Step: 23 |
| | | Execute Procedure: H_CRP_DHS_DODUU Unit in Use modif after DoD | | |
| 23 | | S/C Mode from SM to SAM | | Next Step: END |
| | | This mode transition will result in a TM/TC rate drop to 500/125. Use BD for commanding and coordinate with Ground Station. SAM Check is included in the following mode transition procedure. Skip step 1, the SM checkout was already performed. | | |
| | | Execute Procedure: H_CRP_DHS_3045 S/C Mode transition from Survival to Sun Acquisition | | |
| | | Increase TM/TC rate | | |

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| | | Execute Procedure: H_CRP_SYS_TMTC Increase TM/TC Rate after Mode Drop | | |
| End of Procedure | | | | |