

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps to perform the recovery after a decontamination failure.

The following failure cases have been identified:

- Decontamination stopped due to a continuity check failed
- Failure of a M1/M2 heater line (HPS switch OFF by MOT/EAT)

The Continuity check failure could indicate an inappropriate heating configuration

The failure of a M1/M2 heater line case is cover by the dedicated procedure H_CRP_SYS_DECH (Recovery from a decontamination heater stuck ON failure)

Summary of Constraints

Spacecraft Configuration

Start of Procedure

Decontamination heating function running or stopped (depending of the anomaly)

End of Procedure

Decontamination heating function running

Reference File(s)

Input Command Sequences

Output Command Sequences

Referenced Displays

ANDs **GRDs** **SLDs**
 ZAZ9J999

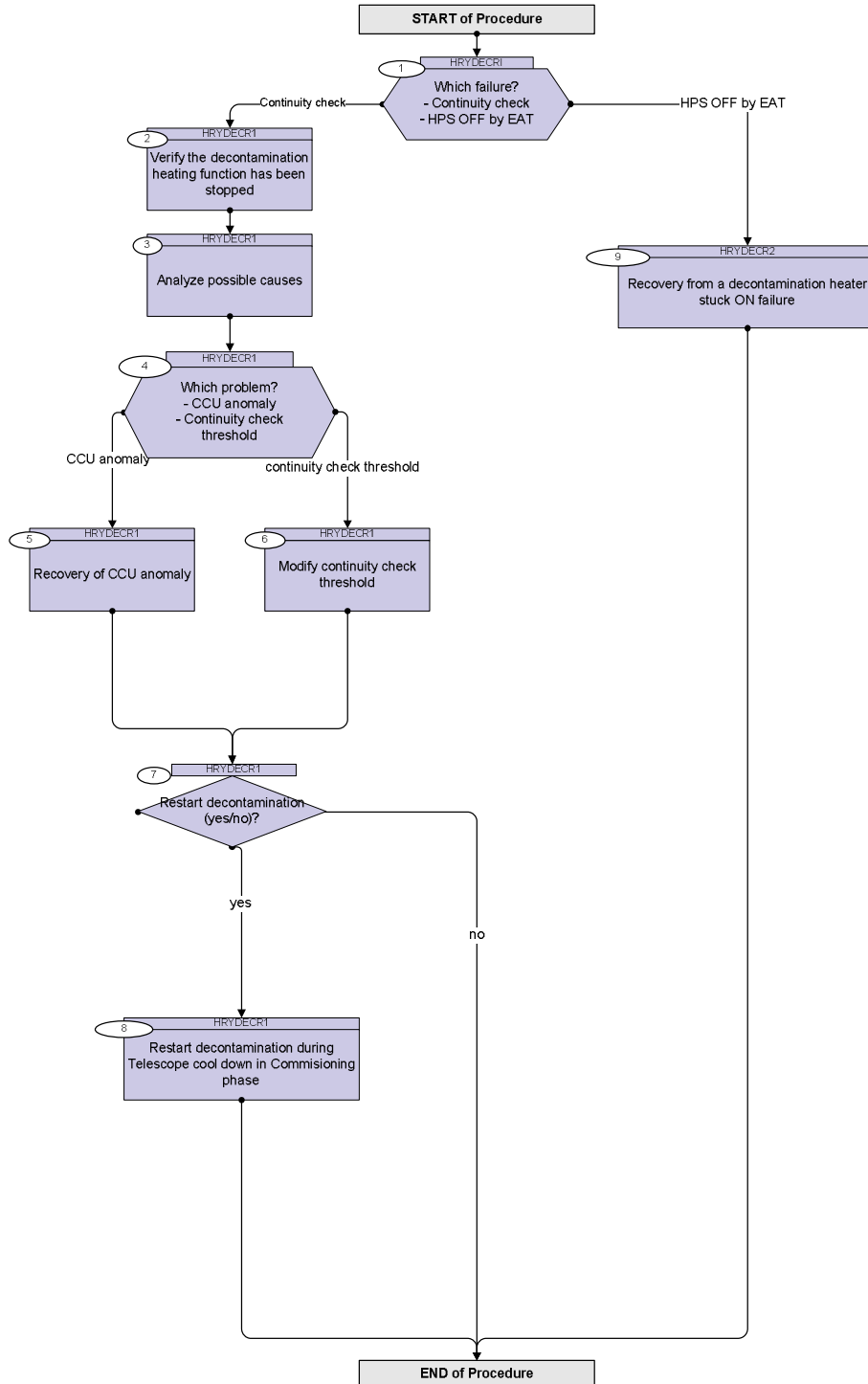
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
01/08/08	1	1	Created	E. Picallo	
08/01/09	2	2	CDMU ASW V3.8 and BSW V2.4 alignment	E. Picallo	
23/02/09	2.1	3	Added impact on decontamination in case of a heater stuck OFF	E. Picallo	
21/03/09	2.2	4	Call to H_CRP_SYS_DEC2 replaced by H_CRP_SYS_DECC (Restart decont. during Telescope cool down in COP)	E. Picallo	
22/04/09	2.3	5	HPS switch OFF failure case cover by dedicated procedure H_CRP_SYS_DECH	E. Picallo	

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Procedure Flowchart Overview



Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch										
Beginning of Procedure														
TC Seq. Name : HRYDECRI (Decont.Recovery init) Decontamination Heating failure recovery TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>														
1		Which failure? - Continuity check - HPS OFF by EAT		Next Step: Continuity check 2 HPS OFF by EAT 9										
1.1		Continuity check failed		<input type="checkbox"/>										
		Verify reception of TM(5,4,113,34) "Continuity Check Failed" This packet is generated whenever two successive median values from the thermistor differ more than the parameter "Continuity Check Threshold" for either of the mirrors (indicated in the event parameter DE800170). The default Maximum acceptable temperature difference between two continuity checks is set to 0.5 °C = 72 RAW DE800170 = 0x0001 for M1 or 0x0002 for M2. The decontamination heating function is stopped whenever this failure occurs.												
		Verify Packet Reception CdmuAsw Event 5-4 Continuity Check Failed - Herschel Packet Details: <table style="margin-left: 20px;"> <tr><td>APID:</td><td>16</td></tr> <tr><td>Type:</td><td>5</td></tr> <tr><td>Subtype:</td><td>4</td></tr> <tr><td>PI1:</td><td>28962</td></tr> <tr><td>PI2:</td><td>0</td></tr> </table>	APID:	16	Type:	5	Subtype:	4	PI1:	28962	PI2:	0	D_EvRp_303	
APID:	16													
Type:	5													
Subtype:	4													
PI1:	28962													
PI2:	0													
		Verify Packet Telemetry (Pkt = D_EvRp_303) <table style="margin-left: 20px;"> <tr><td>Function_ID</td><td>DE008170</td><td>= DecontHeating</td></tr> </table>	Function_ID	DE008170	= DecontHeating		(None)							
Function_ID	DE008170	= DecontHeating												
		Verify Packet Telemetry (Pkt = D_EvRp_303) <table style="margin-left: 20px;"> <tr><td>LsbEvtId</td><td>DE098170</td><td>= 34 <dec></td></tr> </table>	LsbEvtId	DE098170	= 34 <dec>		(None)							
LsbEvtId	DE098170	= 34 <dec>												
		Verify Packet Telemetry (Pkt = D_EvRp_303) <table style="margin-left: 20px;"> <tr><td>SID</td><td>DE010170</td><td>Don't Care</td></tr> </table>	SID	DE010170	Don't Care		(None)							
SID	DE010170	Don't Care												
		Verify Packet Telemetry (Pkt = D_EvRp_303) <table style="margin-left: 20px;"> <tr><td>MirrorId</td><td>DE800170</td></tr> </table>	MirrorId	DE800170										
MirrorId	DE800170													
		Verify Packet Telemetry (Pkt = D_EvRp_303) <table style="margin-left: 20px;"> <tr><td>EventSeqCounter</td><td>DE069170</td></tr> </table>	EventSeqCounter	DE069170										
EventSeqCounter	DE069170													
1.2		HPS OFF by EAT		<input type="checkbox"/>										

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		In case of a heater stuck ON failure on M1 or M2 during decontamination, due to new strategy at 170K (HPS#1,6,10,15,17 shall be switched OFF by MOT/EAT if the median temperature for M1 or M2 is higher than 200K)		
<p><i>TC Seq. Name : HRYDECR1 (DecontContinuityfail)</i> Decontamination Recovery: Continuity check failed</p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;"><input type="checkbox"/></p>				
2		Verify the decontamination heating function has been stopped		Next Step: 3
		Verify Telemetry DhSts DEG17170	= Stopped	AND=ZAZ9J999
3		Analyze possible causes		Next Step: 4
		<p>The possible causes could be:</p> <ul style="list-style-type: none"> - continuity check threshold not correctly defined - if the median temperature increases or decreases too fast -> inappropriate decontamination configuration (thermistor tresholds, heater mask...) - if incoherent median temperature values -> CCU anomaly 		
3.1		Report decontamination parameters		<input type="checkbox"/>
		Execute Procedure: H_LEO_SYS_DECS Decontamination Heating Status Report		
3.2		Analyze thermistors values		<input type="checkbox"/>
		Analyze the evolution of the thermistors values and median temperature before the failure, and check if the temperature varies too fast or if any thermistor shows incoherent values with respect to the others.		
3.3		Verify Mirror 1 Temperature		<input type="checkbox"/>

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The nominal thermal sensors to be used for M1 decontamination are TH A (T331), TH A'' (T332), TH C (T335).		
		Verify M1 TH A Telemetry PT1000_T331 KD253302		AND=ZAZ9J999
		Verify M1 TH A'' Telemetry PT1000_T332 KD248303		AND=ZAZ9J999
		Verify M1 TH C Telemetry PT1000_T335 KD255302		AND=ZAZ9J999
		Verify M1 TH A' Telemetry PT1000_T333 KD254302		AND=ZAZ9J999
		Verify M1 TH B Telemetry PT1000_T334 KD249303		AND=ZAZ9J999
		Verify M1 TH B' Telemetry PT1000_T336 KD250303		AND=ZAZ9J999
		Verify M1 TH B'' Telemetry PT1000_T338 KD251303		AND=ZAZ9J999
		Verify M1 TH C' Telemetry PT1000_T337 KD256302		AND=ZAZ9J999
		Verify M1 TH C'' Telemetry PT1000_T340 KD252303		AND=ZAZ9J999
3.4		Verify Mirror 2 Temperature		<input type="checkbox"/>
		The nominal thermal sensors to be used for M2 decontamination are TH X (T339), TH Y (T341), TH Z (T342).		
		Verify M2 TH X Telemetry PT1000_T339 KD257302		AND=ZAZ9J999
		Verify M2 TH Y Telemetry PT1000_T341 KD258302		AND=ZAZ9J999
		Verify M2 TH Z Telemetry PT1000_T342 KD262303		AND=ZAZ9J999
3.5		Verify Median temperature		<input type="checkbox"/>
		Verify Telemetry DhM1Temp DE800171		AND=ZAZ9J999
		Verify Telemetry DhM2Temp DE801171		AND=ZAZ9J999

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
4		Which problem? - CCU anomaly - Continuity check threshold		Next Step: CCU anomaly 5 continuity check threshold 6
		Incoherent thermistors values -> CCU anomaly Median temperature varies too fast or the continuity check threshold is not correctly defined -> Modify continuity check threshold		
5		Recovery of CCU anomaly		Next Step: 7
		Call Procedure H_CRP_CCUR CCU ANOMALY		
		Execute Procedure: H_CRP_CCUR CCU Anomaly		
		WARNING: In case of a permanent CCU invalid, a new thermistors triplet shall be selected to calculate the median temperature (acquired only from the healthy CCU) as described in H_CRP_CCUR .		
6		Modify continuity check threshold		Next Step: 7
		After analysis, maybe the continuity check threshold must be modified before restarting the decontamination to prevent that it triggers again. In this case call to procedure H_CRP_SYS_DECP to modify the continuity check threshold		
		Execute Procedure: H_CRP_SYS_DECP Decontamination Heating parameters Update		
7		Restart decontamination (yes/no)?		Next Step: yes 8 no END
8		Restart decontamination during Telescope cool down in Commissioning phase		Next Step: END

Decontamination Heating failure recovery
 File: H_CRP_SYS_DECR.xls
 Author: E. Picallo



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Call the following procedure to restart the decontamination after a contingency check failure during Telescope cool down in Commissioning phase.		
		Execute Procedure: H_CRP_SYS_DECC Restart telescope decontamination		
		WARNING: Currently it is not foreseen to perform telescope decontamination during LEOP. However if that was the case i.e. the LEOP procedure H_LEO_SYS_DEC1 (START DECONTAMINATION) was executed, to restart the decontamination after a contingency check failure execute the following procedure: H_CRP_SYS_DEC2 Restart telescope decontamination (during LEOP)		
<p>TC Seq. Name : HRYDECR2 (Decont HPS OFF fail) Decontamination Recovery: HPS OFF by EAT</p> <p>TimeTag Type: N Sub Schedule ID: <input type="checkbox"/></p>				
9		<i>Recovery from a decontamination heater stuck ON failure</i>		Next Step: END
		Call to H_CRP_SYS_DECH (Recovery from a decontamination heater stuck ON failure)		
		Execute Procedure: H_CRP_SYS_DECH Recovery from a decontamination heater stuck ON failure		
End of Procedure				