

Recovery from a LOU heater failure
File: H_CRP_SYS_LOUR.xls
Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps to recover from a LOU heater failure. Three possible contingency cases have been identified. They are related to a failure of one of the two heaters used in the decontamination:

- 1) LCL short-circuit->LCL is automatically switched OFF
- 2) heater short-circuit->LCL overcurrent due to the heater overdispation
- 3) LCL permanently OFF due to a mechanical failure

The cases 1) and 3) are detected by TM observation of the corresponding LCL status parameter, which will remain OFF. The case 2) is detected by TM observation of an overcurrent in the corresponding LCL current parameter.

The aim of this procedure is to modify the pair of heaters involved in the decontamination and select the two healthy ones. The possible redundant heater configurations are:
- LCL59 (Lou Dec Heater 1) & LCL66 (Lou Dec Heater 3), or
- LCL61 (Lou Dec Heater 2) & LCL66 (Lou Dec Heater 3)

Summary of Constraints

The only failure case considered in this procedure is when a heater remains permanently OFF.
The case of a heater permanently ON is not possible because the LOU heaters are protected with OP-LCL, which ensures that the heater line is always switched OFF after a single failure.

Lou Baffle Parameters is changed using ASW TC(8,4,118,3), thus the status of the ASW function "Lou Baffle Management" has to be "running".

Spacecraft Configuration

Start of Procedure

LOU Baffle decontamination ongoing
Nominal LOU Baffle heater configuration

End of Procedure

LOU Baffle decontamination ongoing
Redundant LOU Baffle heater configuration

Reference File(s)

Input Command Sequences

Output Command Sequences

HRYLOUR1
HRYLOUR2

Referenced Displays

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ANDs **GRDs** **SLDs**
 ZAZ9I999
 WALC3584

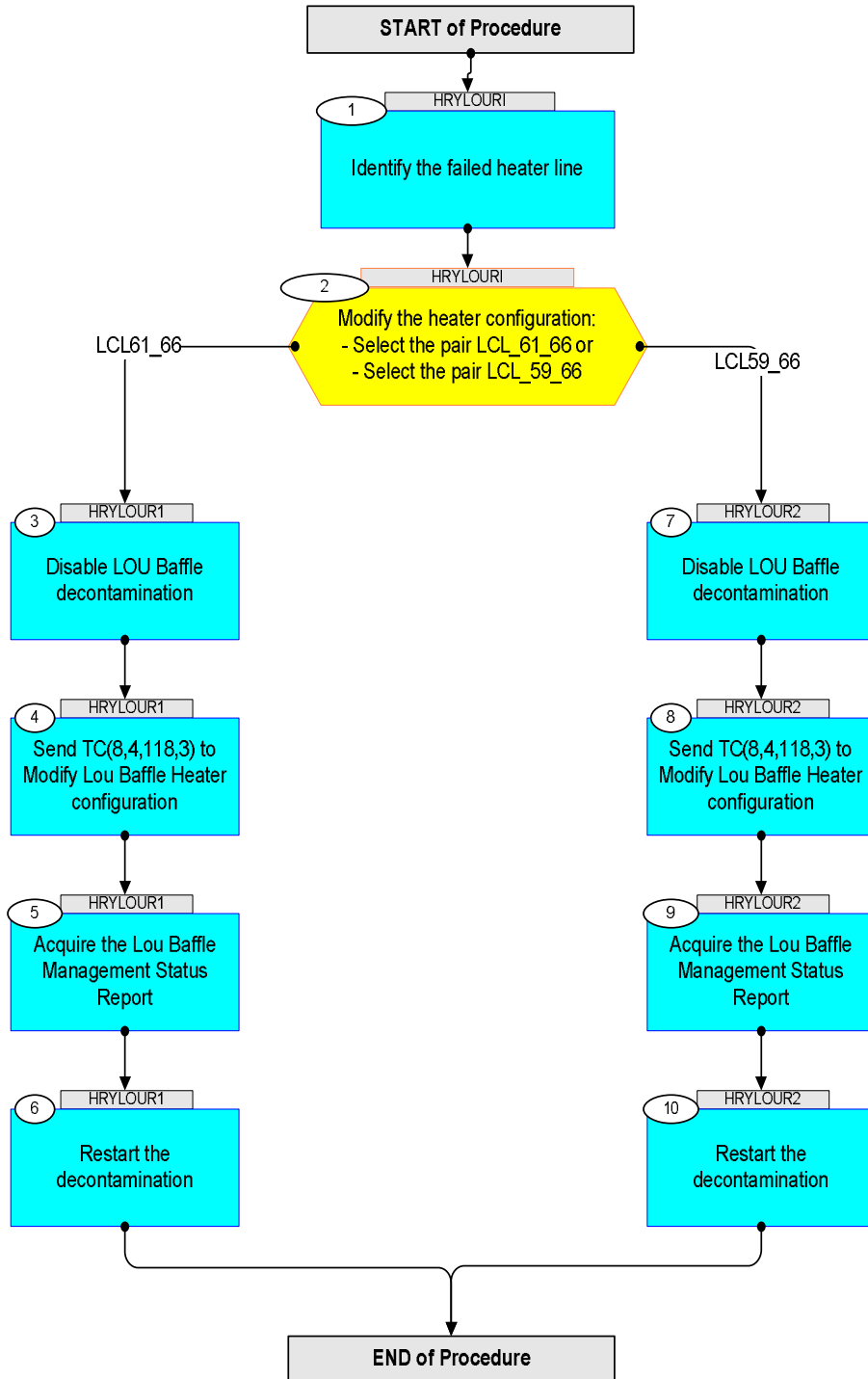
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
22/09/08		1	Created	E. Picallo	
08/01/09	2	2	LOU baffle thresholds refrence updated to [220,230]K according to H-P-2-ASP-ID-1418 issue 4	E. Picallo	

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Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
Beginning of Procedure				
TC Seq. Name : HRYLOURI (LOU htr Fail Init) Recovery from a LOU heater failure Init TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
1		Identify the failed heater line		Next Step: 2
1.1		Acquisition of LOU Baffle decontamination nominal heater lines (LCL59&61)		<input type="checkbox"/>
		Nominally, the two heater lines used for the LOU decontamination are the corresponding to LCL59 (Lou Dec Heater 1) & LCL61 (Lou Dec Heater 2) Verify their status and current to know which heater is failed (LCL status permanently OFF or overcurrent detection)		
		Verify Telemetry LouDecH1_L59_1S WM42F565		AND=ZAZ9I999
		Verify Telemetry LouDecH1_L59_2S WM42M565		AND=WALC3584
		Verify Telemetry LouDecH1_L59_I WM411565		AND=ZAZ9I999
		Verify Telemetry LouDecH2_L61_1S WM72F565		AND=ZAZ9I999
		Verify Telemetry LouDecH2_L61_2S WM72M565		AND=WALC3584
		Verify Telemetry LouDecH2_L61_I WM711565		AND=ZAZ9I999
1.2		Acquisition of LOU Baffle decontamination thermistors		<input type="checkbox"/>
		Verify LOU THERMISTOR 1 Telemetry LouBaffleTemp1 ZMP17999		AND=ZAZ9I999
		Verify LOU THERMISTOR 2 Telemetry LouBaffleTemp2 ZMP18999		AND=ZAZ9I999
		Verify LOU THERMISTOR 3 Telemetry LouBaffleTemp3 ZMP19999		AND=ZAZ9I999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
2		Modify the heater configuration: - Select the pair LCL_61_66 or - Select the pair LCL_59_66		Next Step: LCL61_66 3 LCL59_66 7
		- if the failed heater is the LCL59 select the pair LCL_61_66 (Lou Dec Heater 2 & 3) to be used during LOU Baffle decontamination - if the failed heater is the LCL61 select the pair LCL_59_66 (Lou Dec Heater 1 & 3) to be used during LOU Baffle decontamination		
TC Seq. Name : HRYLOUR1 (LOUtrFailNtoR61&66) Recovery from a LOU heate reconfig. Nom to Red LCL61&LCL66 TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
3		Disable LOU Baffle decontamination		Next Step: 4
		Execute Telecommand <p style="text-align: center;">DisableLouBaffleCtrl</p> TC Control Flags : <p style="text-align: center;">GBM IL DSE --Y -- ---</p> Subsch. ID : 10 Det. descr. : Disable Lou Baffle control TC(8,4,118,2)	DCP04170	
3.1		Acquire the Lou Baffle Management Status Report		<input type="checkbox"/>
		Call procedure to acquire the Lou Baffle Management Status Report and verify that the LOU Baffle control is Disabled.		
		Execute Procedure: H_FCP_SYS_LOUS Lou Baffle Management Status Report		
4		Send TC(8,4,118,3) to Modify Lou Baffle Heater configuration		Next Step: 5

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand ModifLouBaffleParams Command Parameter(s) : ModLouBafHeatCf DH156170 Yes (Def) ModLouBafLowThr DH157170 No ModLouBafHiThr DH158170 No LouBafHeatCnfId DH159170 LCL_61_66 LouBafLowThr_C DH160170 -53.15 degC LouBafHiThr_C DH161170 -43.15 degC TC Control Flags : GBM IL DSE --Y -- --- Subsch. ID : 10	DCP05170	
		Det. descr. : TEMPLATE Modify Lou Baffle parameters TC(8,4,118,3)		
5		Acquire the Lou Baffle Management Status Report		Next Step: 6
		Call procedure to acquire the Lou Baffle Management Status Report and verify the heater configuration.		
		Execute Procedure: H_FCP_SYS_LOUS Lou Baffle Management Status Report		
6		Restart the decontamination		Next Step: END
		Call procedure to Start LOU Baffle decontamination		
		Execute Procedure: H_FCP_SYS_LOU1 Start LOU Baffle Decontamination		
TC Seq. Name : HRYLOUR2 (LOUtrFail1NtoR59&66) Recovery from a LOU heater reconfig. Nom to Red LCL59 and LCL66 TimeTag Type: N Sub Schedule ID: <input type="checkbox"/>				
7		Disable LOU Baffle decontamination		Next Step: 8

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand DisableLouBaffleCtrl <i>TC Control Flags :</i> GBM IL DSE --Y -- --- <i>Subsch. ID : 10</i> Det. descr. : Disable Lou Baffle control TC(8,4,118,2)	DCP04170	
7.1		Acquire the Lou Baffle Management Status Report		<input type="checkbox"/>
		Call procedure to acquire the Lou Baffle Management Status Report and verify that the LOU Baffle control is Disabled.		
		Execute Procedure: H_FCP_SYS_LOUS Lou Baffle Management Status Report		
8		Send TC(8,4,118,3) to Modify Lou Baffle Heater configuration		Next Step: 9
		Execute Telecommand ModifLouBaffleParams <i>Command Parameter(s) :</i> ModLouBafHeatCf DH156170 Yes (Def) ModLouBafLowThr DH157170 No ModLouBafHiThr DH158170 No LouBafHeatCnfId DH159170 LCL_59_66 LouBafLowThr_C DH160170 -53.15 degC LouBafHiThr_C DH161170 -43.15 degC <i>TC Control Flags :</i> GBM IL DSE --Y -- --- <i>Subsch. ID : 10</i>	DCP05170	
		Det. descr. : TEMPLATE Modify Lou Baffle parameters TC(8,4,118,3)		
9		Acquire the Lou Baffle Management Status Report		Next Step: 10
		Call procedure to acquire the Lou Baffle Management Status Report and verify the heater configuration.		
		Execute Procedure: H_FCP_SYS_LOUS Lou Baffle Management Status Report		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
10		<i>Restart the decontamination</i>		Next Step: END
		Call procedure to Start LOU Baffle decontamination		
		Execute Procedure: H_FCP_SYS_LOU1 Start LOU Baffle Decontamination		
End of Procedure				