

Recovery after a TTC-S out of limit
 File: H_CRP_TTC_TLR.xls
 Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps needed:
 -to check the main TTC-S parameters for which it is not foreseen an on-board FDIR in case of an out of limit condition;
 -to perform the switchover from nominal to redundant channel.

Summary of Constraints

Spacecraft Configuration

Start of Procedure

CDMU in default configuration.
 Downlink enabled via nominal channel.

End of Procedure

CDMU in default configuration.
 Downlink enabled via nominal channel.

Reference File(s)

Input Command Sequences

Output Command Sequences

Referenced Displays

ANDs	GRDs	SLDs
ZAZ7I999		
ZAZ7J999		

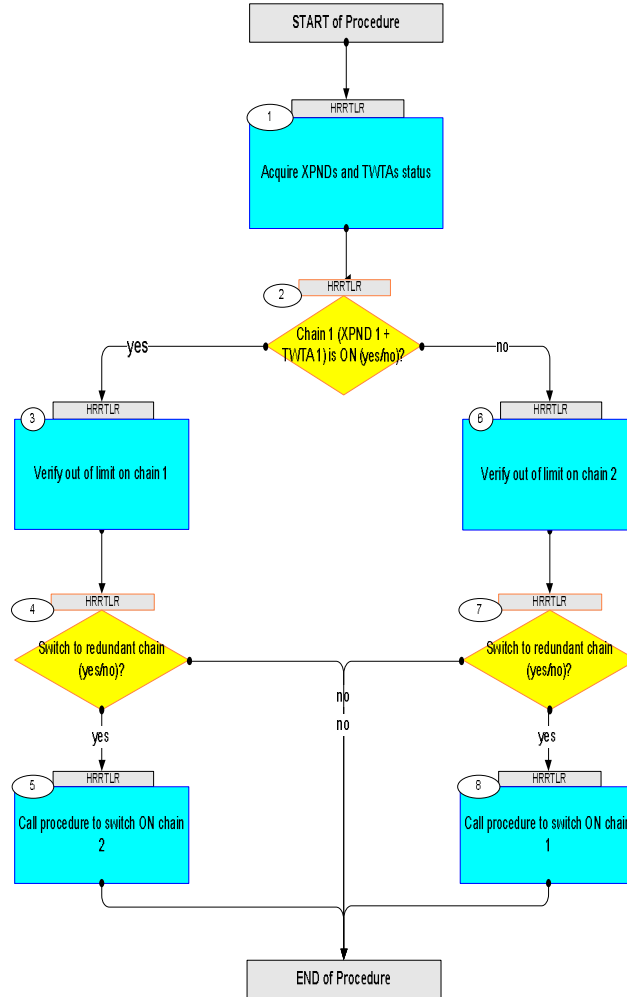
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
15/10/08		1	Created	E. Picallo	
19/12/08	2	2	"Verify no out of limit on chain 1/2" text replaced by "Verify out of limit on chain 1/2"	E. Picallo	
24/03/09	2.2	3	Detection and recovery from TWT high temperature added	E. Picallo	
16/04/09	2.3	4	RXs temp, TXs temp and TWTs Ao limits updated	E. Picallo	
05/05/09	2.4	5	SAA constraint on TX and TWTA temperature for long DTCP removed	E. Picallo	
13/07/09	2.5	5.01	Validation : TWT Anode voltage soft limit updated Rx/Tx temp soft limit updated	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 : HRRTLRL (TTC OOL Recovery) Recovery after a TTC-S out of limit TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
1		Acquire XPNDs and TWTAs status		Next Step: 2
1.1		Verify Chain 1 (XPND 1 + TWTA 1) status		<input type="checkbox"/>
		Verify Tx1 Status Telemetry TX1 ON-OFF Stat RMB15442		AND=ZAZ7I999
		Verify EPC1 Status Telemetry EPC1_ONOFF_STS RMB05439		AND=ZAZ7J999
		Verify TWT1 Status Telemetry TWT1_ONOFF_STS RMB09439		AND=ZAZ7J999
1.2		Verify Chain 2 (XPND 2 + TWTA 2) status		<input type="checkbox"/>
		Verify TX2 Status Telemetry TX2 ON-OFF Stat RMB16442		AND=ZAZ7I999
		Verify EPC2 Status Telemetry EPC2_ONOFF_STS RMB07439		AND=ZAZ7J999
		Verify TWT2 Status Telemetry TWT2_ONOFF_STS RMB10439		AND=ZAZ7J999
2		Chain 1 (XPND 1 + TWTA 1) is ON (yes/no)?		Next Step: yes 3 no 6
3		Verify out of limit on chain 1		Next Step: 4
		Verify that one of the following TTC chain 1 parameter is not within the expected value range i.e. one of the condition expressed bellow is violated.		
		Verify Rx1 temperature Telemetry RX1_TEMP RMB02442	>= -15.0 degC <= 55.0 degC	AND=ZAZ7I999
		Verify LCL23 (XPND1 Tx) current Telemetry Xpnd1Tx_L23_I WM109565	>= 0.38 A <= 0.55 A	AND=ZAZ7I999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Tx1 Supply Voltage Telemetry XPND1_TX1_SUP_V	RMB05442 >= 6.0 V <= 6.93 V	AND=ZAZ7I999
		Verify Tx1 Temperature Telemetry TX1_TEMP	RMB01442 >= -15.0 degC <= 55.0 degC	AND=ZAZ7I999
		Verify TWTAl current Telemetry Twta_1_L49_I	WM210565 >= 2.4 A <= 2.8 A	AND=ZAZ7J999
		Verify EPC1 Anode Voltage Telemetry EPC1_ANODE_VOLT	RMB01439 >= 1077.0 V <= 1137.0 V	AND=ZAZ7J999
		Verify EPC1 Temperature Telemetry EPC1_TEMP	RMB11439 >= -15.0 degC <= 55.0 degC	AND=ZAZ7J999
		Verify RFDN Isolator 1 Temp Telemetry RFDN_ISOL1_TEMP	RMB01436 >= -15.0 degC <= 35.0 degC	AND=ZAZ7J999
		Verify RFDN Diplexer 1 Temp Telemetry RFDN_DIPL1_TEMP	RMB03436 >= -15.0 degC <= 35.0 degC	AND=ZAZ7J999
4		Switch to redundant chain (yes/no)?		Next Step: yes 5 no END
		In case of Hard out of limit condition, consider to switch to the redundant TTC chain		
		Verify Rx1 temperature Telemetry RX1_TEMP	RMB02442 >= 60.0 degC	AND=ZAZ7I999
		Verify LCL23 (XPND1 Tx) current Telemetry Xpnd1Tx_L23_I	WM109565 >= 0.65 A	AND=ZAZ7I999
		Verify Tx1 Supply Voltage Telemetry XPND1_TX1_SUP_V	RMB05442 >= 7.56 V	AND=ZAZ7I999
		Verify Tx1 Temperature Telemetry TX1_TEMP	RMB01442 >= 60.0 degC	AND=ZAZ7I999
		Verify TWTAl current Telemetry Twta_1_L49_I	WM210565 >= 3.0 A	AND=ZAZ7J999
		Verify EPC1 Anode Voltage Telemetry EPC1_ANODE_VOLT	RMB01439 >= 1230.0 V <= 950.0 V	AND=ZAZ7J999
		Verify EPC1 Temperature Telemetry EPC1_TEMP	RMB11439 >= 60.0 degC	AND=ZAZ7J999
5		Call procedure to switch ON chain 2		Next Step: END

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Procedure: H_CRP_TTC_T2LR Switch to chain 2 after a TTC-S out of limit		
6		Verify out of limit on chain 2		Next Step: 7
		Verify that one of the following TTC chain 2 parameter is not within the expected value range i.e. one of the condition expressed bellow is violated.		
		Verify Rx2 temperature Telemetry RX2_TEMP RMB04442	>= -15.0 degC <= 55.0 degC	AND=ZAZ7I999
		Verify LCL16 (XPND2 Tx) current Telemetry Xpnd2Tx_L16_I WM908565	<= 0.38 A <= 0.55 A	AND=ZAZ7I999
		Verify TX2 Supply Voltage Telemetry XPND2_TX2_SUP_V RMB06442	>= 6.0 V <= 6.93 V	AND=ZAZ7I999
		Verify TX2 Temperature Telemetry TX2_TEMP RMB03442	>= -15.0 degC <= 55.0 degC	AND=ZAZ7I999
		Verify Telemetry Twta_2_L50_I WM910565	>= 2.4 A <= 2.8 A	AND=ZAZ7J999
		Verify EPC2 Anode Voltage Telemetry EPC2_ANODE_VOLT RMB03439	>= 998.0 V <= 1058.0 V	AND=ZAZ7J999
		Verify EPC2 Temperature Telemetry EPC2_TEMP RMB12439	>= -15.0 degC <= 55.0 degC	AND=ZAZ7J999
		Verify RFDN Isolator 2 Temp Telemetry RFDN_ISOL2_TEMP RMB02436	>= -15.0 degC <= 35.0 degC	AND=ZAZ7J999
		Verify RFDN Diplexer 2 Temp Telemetry RFDN_DIPL2_TEMP RMB04436	>= -15.0 degC <= 35.0 degC	AND=ZAZ7J999
7		Switch to redundant chain (yes/no)?		Next Step: yes 8 no END
		In case of Hard out of limit condition, consider to switch to the redundant TTC chain		
		Verify Rx2 temperature Telemetry RX2_TEMP RMB04442	>= 60.0 degC	AND=ZAZ7I999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify LCL16 (XPND2 Tx) current Telemetry Xpnd2Tx_L16_I WM908565	>= 0.65 A	AND=ZAZ7I999
		Verify TX2 Supply Voltage Telemetry XPND2_TX2_SUP_V RMB06442	>= 7.56 V	AND=ZAZ7I999
		Verify TX2 Temperature Telemetry RMB03442	>= 60.0 degC	AND=ZAZ7I999
		Verify Telemetry Twta_2_L50_I WM910565	>= 3.0 A	AND=ZAZ7J999
		Verify EPC2 Anode Voltage Telemetry EPC2_ANODE_VOLT RMB03439	>= 1230.0 V <= 950.0 V	AND=ZAZ7J999
		Verify EPC2 Temperature Telemetry EPC2_TEMP RMB12439	>= 60.0 degC	AND=ZAZ7J999
8		Call procedure to switch ON chain 1		Next Step: END
		Execute Procedure: H_CRP_TTC_T1LR Switch to chain 1 after a TTC-S out of limit		
End of Procedure				