

Enable or disable BCRs
 File: H_CRP_EPS_BCR.xls
 Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps needed to enable back or disable continuously the faulty BCR 1/2/3 after an Over Charge Protection activation.

Summary of Constraints

It is necessary to enable/disable the BCR in case of battery over charge protection activation that shorts the BCR related Solar Array section.

This protection can be activated spuriously or due to a failure within the charger. To discriminate the cause, it is necessary to reset the protection (by switching OFF and then ON the BCR); if after the reset the protection is again triggered then it is necessary to isolate the faulty BCR by disabling it.

BCR is switched OFF/ON using TCs(8,4,112,3/5) thus the ASW function "PCDU Management" has to be running.

Spacecraft Configuration

Start of Procedure

CDMU in default configuration;
 BCR 1/2/3 over charge protection active.

End of Procedure

CDMU in default configuration;
 either BCR 1/2/3 over charge protection not active;
 or BCR 1/2/3 OFF.

Reference File(s)

Input Command Sequences

Output Command Sequences

HRWBCR1
 HRWBCR2
 HRWBCR3

Referenced Displays

ANDs GRDs SLDs
 ZAZ7H999

Configuration Control Information

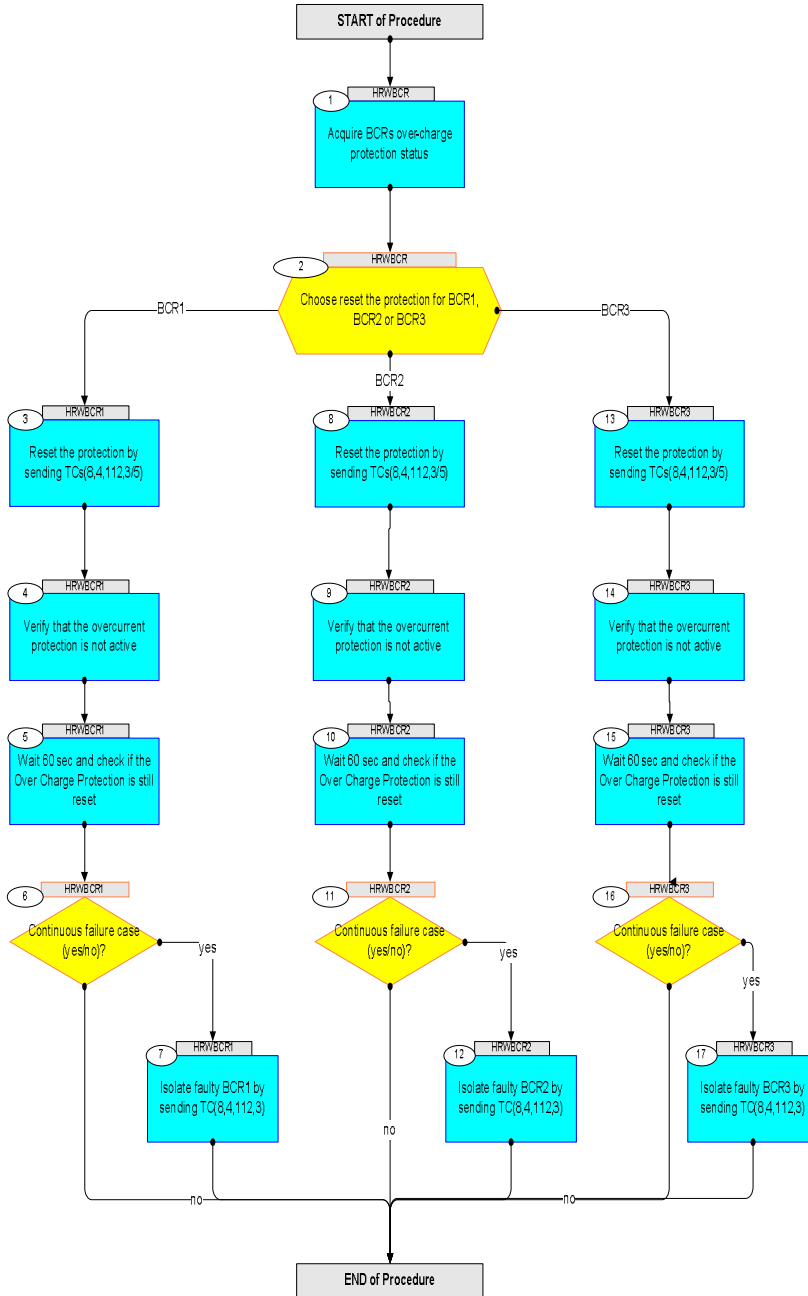
DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
23/07/08	1	1	Created	E. Picallo	
15/12/08	2	2	Expected BCRs OCP status corrected in case of Continuous failure	E. Picallo	
17/04/09	2.3	3	sequence updated: Disable BCR then Check OCP is RESET then Re-enable BCR	E. Picallo	

Status : Version 3 - Unchanged
 Last Checkin: 17/04/09

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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 :HRWBCR (Enable/Disable BCRs)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;"><input type="checkbox"/></p>				
1		Acquire BCRs over-charge protection status		Next Step: 2
		Verify BCR1 over-charge protection status Telemetry BCR1_OCP_STS WMT1H565		AND=ZAZ7H999
		Verify BCR2 over-charge protection status Telemetry BCR2_OCP_STS WMT1J565		AND=ZAZ7H999
		Verify BCR3 over-charge protection status Telemetry BCR3_OCP_STS WMT1K565		AND=ZAZ7H999
		<p>In case of battery over charge protection activation is detected it is necessary to reset the protection (by switching OFF and then ON the BCR)</p> <p>If after the reset the protection is again triggered then it is necessary to isolate the faulty BCR by disabling it.</p>		
2		Choose reset the protection for BCR1, BCR2 or BCR3		Next Step: BCR1 3 BCR2 8 BCR3 13
<p><i>TC Seq. Name :HRWBCR1 (Enable/Disable BCR1)</i> Reset OCP (by switch OFF and then ON the BCR1)</p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;"><input type="checkbox"/></p>				
3		Reset the protection by sending TCs(8,4,112,3/5)		Next Step: 4
		In case of BCR OCP activation, the BCR switch OFF/ON resets the protection		
3.1		Switch BCR1 OFF		<input type="checkbox"/>

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		Execute Switch BCR1 OFF Telecommand SwOff_PCDU_BCR1 <i>TC Control Flags :</i> GBM IL DSE --Y -- -- <i>Subsch. ID : 10</i> Det. descr. : PCDU: Perform Activity TC(8,4,112,3) switch BCR1 off	DC77B170	
		Verify 1553 BCR1 ON/OFF command Read-back Telemetry BCR1_1553CmdSts WMT3A565	= DISABLED	AND=ZAZ7H999
3.2		Verify that the overcurrent protection is not active		<input type="checkbox"/>
		Verify BCR1 over-charge protection status Telemetry BCR1_OCP_STS WMT1H565	= NOTACTIVE	AND=ZAZ7H999
3.3		Switch BCR1 ON		<input type="checkbox"/>
		Execute Switch BCR1 ON Telecommand SwOn_PCDU_BCR1 <i>TC Control Flags :</i> GBM IL DSE --Y -- -- <i>Subsch. ID : 10</i> Det. descr. : PCDU: Perform Activity TC(8,4,112,5) switch BCR1 on	DC77D170	
		Verify 1553 BCR1 ON/OFF command Read-back Telemetry BCR1_1553CmdSts WMT3A565	= ENABLED	AND=ZAZ7H999
4		Verify that the overcurrent protection is not active		Next Step: 5
		Verify BCR1 over-charge protection status Telemetry BCR1_OCP_STS WMT1H565	= NOTACTIVE	AND=ZAZ7H999
5		Wait 60 sec and check if the Over Charge Protection is still reset		Next Step: 6
		Note that 60 sec it is considered a sufficient time to detect the reason of the protection activation. In fact if the BCR is charging the battery to its reference voltage no activation of the over charging protection is possible.		
		WARNING: If the overcurrent protection is still not active the protection has been triggered spuriously.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify BCR2 over-charge protection status Telemetry BCR2_OCP_STS WMT1J565	= NOTACTIVE	AND=ZAZ7H999
8.3		Switch BCR2 ON		□
		Execute Switch BCR2 ON Telecommand SwOn_PCDU_BCR2 TC Control Flags : GBM IL DSE --Y -- -- Subsch. ID : 10 Det. descr. : PCDU: Perform Activity TC(8,4,112,5) switch BCR2 on	DC78D170	
		Verify 1553 BCR2 ON/OFF command Read-back Telemetry BCR2_1553CmdSts WMT3B565	= ENABLED	AND=ZAZ7H999
9		Verify that the overcurrent protection is not active		Next Step: 10
		Verify BCR2 over-charge protection status Telemetry BCR2_OCP_STS WMT1J565	= NOTACTIVE	AND=ZAZ7H999
10		Wait 60 sec and check if the Over Charge Protection is still reset		Next Step: 11
		Note that 60 sec it is considered a sufficient time to detect the reason of the protection activation. In fact if the BCR is charging the battery to its reference voltage no activation of the over charging protection is possible.		
		WARNING: If the overcurrent protection is still not active the protection has been triggered spuriously.		
11		Continuous failure case (yes/no)?		Next Step: yes 12 no END
		If continuous failure case then BCR2 OCP is Active BCR2_OCP_STS WMT1J565	= ACTIVE	AND=ZAZ7H999
12		Isolate faulty BCR2 by sending TC(8,4,112,3)		Next Step: END

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Switch BCR2 OFF Telecommand SwOff_PCDU_BCR2 <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : PCDU: Perform Activity TC(8,4,112,3) switch BCR2 off	DC78B170	
		Verify 1553 BCR2 ON/OFF command Read-back Telemetry BCR2_1553CmdSts WMT3B565	= DISABLED	AND=ZAZ7H999
<p><i>TC Seq. Name :HRWBCR3 (Enable/Disable BCR3)</i> <i>Reset OCP (by switch OFF and then ON the BCR3)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p>□</p>				
13		<i>Reset the protection by sending TCs(8,4,112,3/5)</i>		Next Step: 14
		In case of BCR OCP activation, the BCR switch OFF/ON resets the protection		
13.1		<i>Switch BCR3 OFF</i>		□
		Execute Switch BCR3 OFF Telecommand SwOff_PCDU_BCR3 <i>TC Control Flags :</i> Subsch. ID : 10 Det. descr. : PCDU: Perform Activity TC(8,4,112,3) switch BCR3 off	DC79B170	
		Verify 1553 BCR3 ON/OFF command Read-back Telemetry BCR3_1553CmdSts WMT3C565	= DISABLED	AND=ZAZ7H999
13.2		<i>Verify that the overcurrent protection is not active</i>		□
		Verify BCR3 over-charge protection status Telemetry BCR3_OCP_STS WMT1K565	= NOTACTIVE	AND=ZAZ7H999
13.3		<i>Switch BCR3 ON</i>		□

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		Execute Switch BCR3 ON Telecommand <p style="text-align: right;">SwOn_PCDU_BCR3</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE ---Y ---</p> Subsch. ID : 10 Det. descr. : PCDU: Perform Activity TC(8,4,112,5) switch BCR3 on	DC79D170	
		Verify 1553 BCR3 ON/OFF command Read-back Telemetry <p style="text-align: center;">BCR3_1553CmdSts WMT3C565</p>	= ENABLED	AND=ZAZ7H999
14		Verify that the overcurrent protection is not active		Next Step: 15
		Verify BCR3 over-charge protection status Telemetry <p style="text-align: center;">BCR3_OCP_STS WMT1K565</p>	= NOTACTIVE	AND=ZAZ7H999
15		Wait 60 sec and check if the Over Charge Protection is still reset		Next Step: 16
		Note that 60 sec it is considered a sufficient time to detect the reason of the protection activation. In fact if the BCR is charging the battery to its reference voltage no activation of the over charging protection is possible.		
		WARNING: If the overcurrent protection is still not active the protection has been triggered spuriously.		
16		Continuous failure case (yes/no)?		Next Step: yes 17 no END
		If continuous failure case then BCR3 OCP is Active <p style="text-align: center;">BCR3_OCP_STS WMT1K565</p>	= ACTIVE	AND=ZAZ7H999
17		Isolate faulty BCR3 by sending TC(8,4,112,3)		Next Step: END
		Execute Switch BCR3 OFF Telecommand <p style="text-align: right;">SwOff_PCDU_BCR3</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE ---Y ---</p> Subsch. ID : 10 Det. descr. : PCDU: Perform Activity TC(8,4,112,3) switch BCR3 off	DC79B170	
		Verify 1553 BCR3 ON/OFF command Read-back Telemetry <p style="text-align: center;">BCR3_1553CmdSts WMT3C565</p>	= DISABLED	AND=ZAZ7H999

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End of Procedure				