

Big Nozzle Close
File: H_CRP_CCU_VBN1.xls
Author: E. Picallo



Procedure Summary

Objectives

This procedure describes the steps to closure of cryostat big nozzle valves (V504/V505)

Summary of Constraints

Monitoring and arming can be simultaneous but in this case the performance of the monitoring sequence is not guaranteed. That is why it is recommended to stop the monitoring before the valves actuation, but not mandatory.

One arming mode can be reached when the CCU is not in another arming mode. This is only valid for valves which are on the same CCU side i.e. it IS possible to get one armed status on CCU-A and another one on CCU-B

Arming mode returns directly to Idle mode if corresponding Valve command is received too fast (<1 sec) or is not received within 180 seconds.

During COP, the timing of closing of the large nozzle by closing valves V505 and/or V506 depends on the launch condition.
A) Nominal launch: The large nozzles shall be closed when the Helium temperature is below 1.7 K about 23 days after the launch.
B) Delayed launch: The large nozzles have to be closed 18h after the maximum Helium temperature as been reached. This point will be reached approximately 4 days after the launch.

Spacecraft Configuration

Start of Procedure

CDMU in default configuration
The CCU monitoring function active
The 1553 interface CDMS, CCU-A and CCU-B shall be enable
Valves V504/V505 opened

End of Procedure

CDMU in default configuration
The CCU monitoring function active
The 1553 interface CDMS, CCU-A and CCU-B shall be enable
Valves V504/V505 closed

Reference File(s)

Input Command Sequences

Output Command Sequences

HRKVBN1

Referenced Displays

ANDs GRDs SLDs

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ZAZ9K999

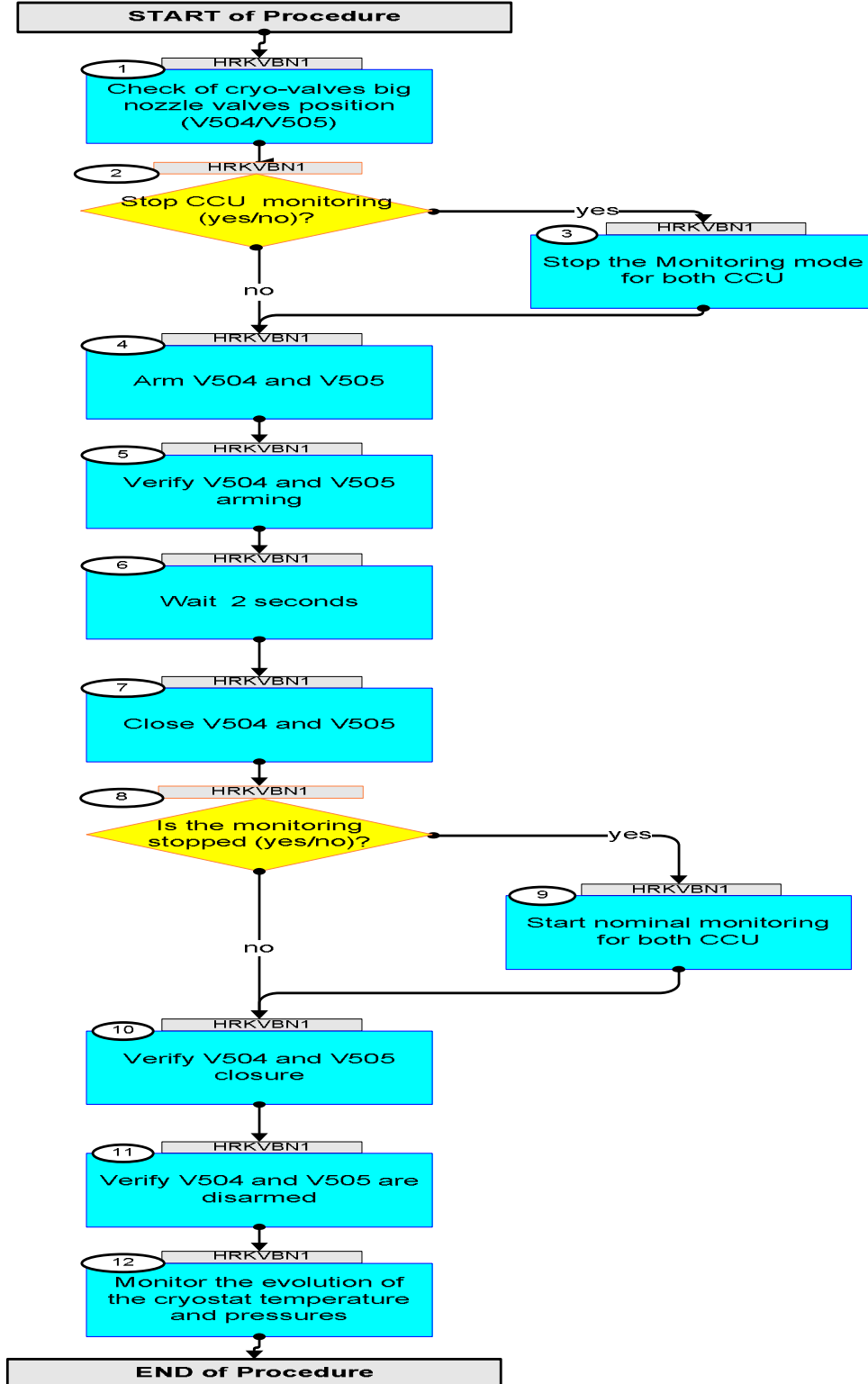
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
30/07/08	1	1	Created	E. Picallo	
14/11/08		2	Big Nozzle closure predicted time according to RFW HP-2-ASED-RW-0009 added.	E. Picallo	
26/11/08	2	3	if monitoring has been stopped, restart it before checking the valves status	E. Picallo	
25/03/09	2.2	4	Summary of constraints updated: One arming mode can be reached when the CCU is not in another arming mode is only valid for valves which are on the same CCU side □ Predicted time for valves closure removed	E. Picallo	
10/04/09		5	Expected timing of V505/V506 closure during COP added	E. Picallo	
22/04/09	2.3	6	cryostat temperature and pressures monitoring added	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				
<p><i>TC Seq. Name : HRKVBN1 (Big Nozzle Close)</i></p> <p><i>TimeTag Type: N</i> <i>Sub Schedule ID:</i></p> <p style="text-align: center;">□</p>				
1		Check of cryo-valves big nozzle valves position (V504/V505)		Next Step: 2
		Verify Telemetry Valv_Stat_VS504 KM271302	= OPEN	AND=ZAZ9K999
		Verify Telemetry Valv_Stat_VS505 KM271303	= OPEN	AND=ZAZ9K999
2		Stop CCU monitoring (yes/no)?		Next Step: no 4 yes 3
		<p>It is recommended to stop the monitoring because its performance is not guaranteed during the valves arming, but it is not mandatory.</p> <p>Note: The valves status is noly available in monitoring mode.</p>		
3		Stop the Monitoring mode for both CCU		Next Step: 4
		Call procedure H_FCP_CCU_ACQP and select "Stop monitoring"		
		Execute Procedure: H_FCP_CCU_ACQP CCU acquisition period update		
4		Arm V504 and V505		Next Step: 5
		Execute Telecommand CCUA_Arm_V504	ZC0Z7999	
		TC Control Flags :	GBM IL DSE --Y -- --	
		Subsch. ID : 10 Det. descr. : TC(8,4,8,1) for CCUA Valve V504 Arming		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand <p style="text-align: right;">CCUB_Arm_V505</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- --</p> Subsch. ID : 10 Det. descr. : TC(8,4,8,1) for CCUB Valve V505 Arming	ZC0ZG999	
5		Verify V504 and V505 arming		Next Step: 6
		Verify Telemetry <p style="text-align: right;">Arm_V504 KM130300</p>	= ARMED	AND=ZAZ9K999
		Verify Telemetry <p style="text-align: right;">Arm_V505 KM130301</p>	= ARMED	AND=ZAZ9K999
6		Wait 2 seconds		Next Step: 7
		There is a constraint that the command to open or close the valves shall not be received less than one second before the arming execution time and 1 second on one hand, and not after the arming execution time and 180 seconds on the other hand.		
7		Close V504 and V505		Next Step: 8
		Execute Telecommand <p style="text-align: right;">CCUA_Close_V504</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- --</p> Subsch. ID : 10 Det. descr. : TC(8,4,8,1) for CCUA Valve V504 Closing	ZC0Z9999	
		Execute Telecommand <p style="text-align: right;">CCUB_Close_V505</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE --Y -- --</p> Subsch. ID : 10 Det. descr. : TC(8,4,8,1) for CCUB Valve V505 Closing	ZC0ZJ999	
8		Is the monitoring stopped (yes/no)?		Next Step: yes 9 no 10

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Warning: if the CCU monitoring have been stopped, it is necessary to restart it before checking the valves status, because these TM parameters are not CCU HK data but they are included in the CCU monitoring data.		
9		<i>Start nominal monitoring for both CCU</i>		Next Step: 10
		Call procedure H_FCP_CCU_ACQP and select the "routine monitoring" (period 512 sec) or Recycling/decontamination (period 8 sec)		
		Execute Procedure: H_FCP_CCU_ACQP CCU acquisition period update		
10		<i>Verify V504 and V505 closure</i>		Next Step: 11
		Verify Telemetry Valv_Stat_VS504 KM271302 = CLOSED		AND=ZAZ9K999
		Verify Telemetry Valv_Stat_VS505 KM271303 = CLOSED		AND=ZAZ9K999
11		<i>Verify V504 and V505 are disarmed</i>		Next Step: 12
		Verify Telemetry Arm_V504 KM130300 = DISARMED		AND=ZAZ9K999
		Verify Telemetry Arm_V505 KM130301 = DISARMED		AND=ZAZ9K999
12		<i>Monitor the evolution of the cryostat temperature and pressures</i>		Next Step: END
		The evolution of the cryostat temperature and pressures needs to be checked w.r.t. the prediction after this operation to confirm the proper isolation of the big nozzles.		
End of Procedure				