CCU TM TOPE check
File: H_FCP_CCU_TCHK.xls
Author: E. Picallo

Procedure Summary

Objectives

This procedure describes the CCUs TM TOPE checks

Summary of Constraints

Specific procedure to check the CCU status during monitoring mode
i.e. not during DLCM or valves actuation.

Valves 103, 106, 501 and 503 will be opened at launch (by Ariane
dry-loops commnands) and they will always remain opened.

On Ground the Valves 504 and 505 status is OPEN and will remain
OPEN at launch (no dry loops commands) but they will be closed
TBD days after in-flight.

The CCUs valves actuation status is checked in step 5 and 15
based on HK telemetry parameters, assuming they are not actuated.
The actual status of the valves is checked in steps 24-27
(dependant on s/c mode).

Spacecraft Configuration

Start of Procedure

CCU A and CCU B switch ON, declared ON and valid on S/C Bus and
configured ON in the UIU table
CCU A and CCU B in monitoring mode

End of Procedure

CCU A and CCU B switch ON, declared ON and valid on S/C Bus and
configured ON in the UIU table
CCU A and CCU B in monitoring mode

Reference File(s)

Input Command Sequences

Output Command Sequences

Referenced Displays

ANDs	GRDs	SLDs
ZAZ9L999		(None)
ZAZ9K999		

Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
28/10/08		1	Created	E. Picallo	

31/10/08		1.01	Validation : MonSeq_Sts TM check corrected	E. Picallo	
02/02/09	2	2	minor expected values correction after HSVT2	E. Picallo	
18/02/09	2.1	3	Include RT error flags check.	E. Picallo	
25/03/09	2.2	4	Valves polarity check removed from SUN after separation	E. Picallo	
30/03/09		5	Launch Mode config updated according to H-P-2-ASP-TS-1780 issue 2	E. Picallo	
09/04/09	2.3	6	Summary constrain updated: - Valves 504 and 505 status is OPEN and will remain OPEN at launch (no dry loops commands) - clarification CCUs valves check on Step 5 and 15 checks are actuation status related	E. Picallo	

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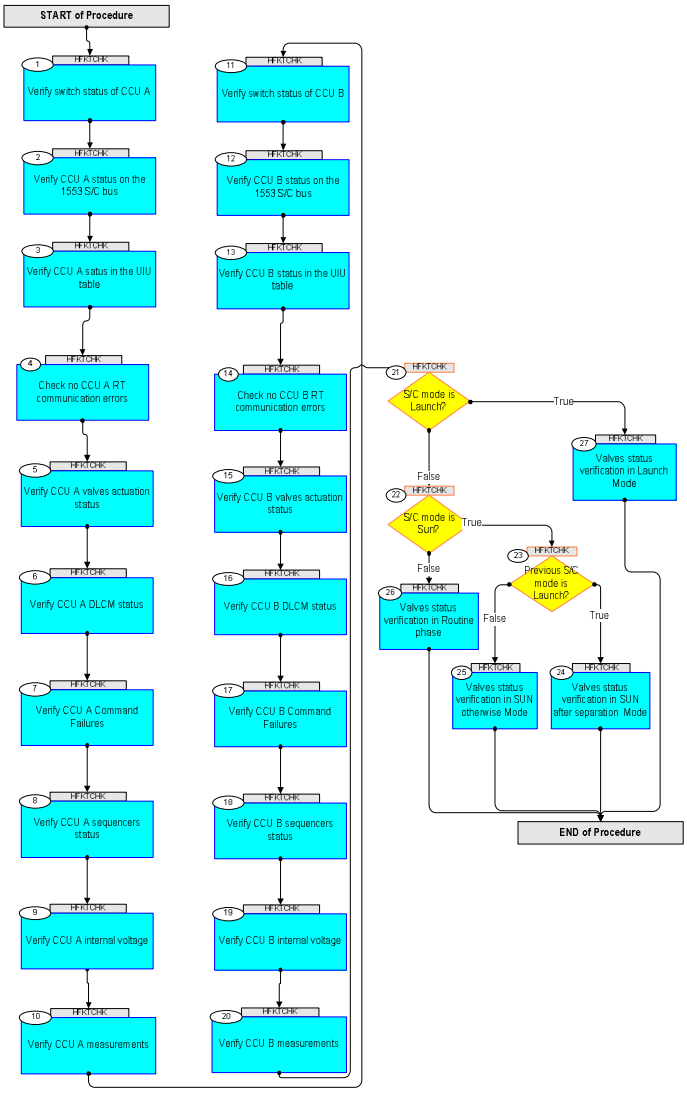
Procedure Flowchart Overview



Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :HFKTCHK (CCU TM TOPE check) CCU subsystem TM TOPE checkout *TimeTag Type:* *Sub Schedule ID:*		
1		*Verify switch status of CCU A*		Next Step: 2
		Verify CCU A (LCL37) line status Telemetry **Ccu_A_L37_S** **WM12A565**	**= ON**	AND=ZAZ9L999
		Verify Telemetry **Ccu_A_L37_I** **WM106565**	**>= 0.10 A** **<= 0.20 A**	AND=ZAZ9L999
2		*Verify CCU A status on the 1553 S/C bus*		Next Step: 3
		Verify Telemetry **CCUA_OnOff** **DED3G161**	**= ON**	AND=ZAZ9L999
		Verify Telemetry **CCUA_DeadAlive** **DED3H161**	**= Alive**	AND=ZAZ9L999
		Verify Telemetry **CCUA_WellSickTC** **DED3Z161**	**= Well**	AND=ZAZ9L999
		Verify Telemetry **CCUA_WellSickTM** **DED3J161**	**= Well**	AND=ZAZ9L999
		Verify Telemetry **CCUA_ValidInval** **DED3K161**	**= Valid**	AND=ZAZ9L999
		Verify Telemetry **CCUA_VitalNonV** **DED62161**	**= NonVital**	AND=ZAZ9L999
		Verify Telemetry **CCUA_NomRed** **DED63161**	**= NOMINAL**	AND=ZAZ9L999
3		*Verify CCU A satus in the UIU table*		Next Step: 4
		Verify Telemetry **CcuAFuncSts** **DEL97171**	**= On**	AND=ZAZ9L999
4		*Check no CCU A RT communication errors*		Next Step: 5

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The CCU RT reports the following error flags in the MIL STD-1553B Status Words: **- RT message error bit: set by the RT upon detection of an error in the message or an illegal message identification.** **- RT busy bit: indicates that the RT or subsystem is unable to move data to or from the subsystem in compliance with thte BC command.** **- RT subsystem flag bit: indicates a subsystem fault condition, and alert the BC to potentially invalid data.** **- RT terminal flag bit: indicates a RT fault condition.** **These RT error bits are not supported by DLL FDIR mechanisms. Thus, if a permanent error is reported on one of these bits, this could indicate a failure in the RT or the CCU, and a recovery action should be taken by calling the contingency procedure H_CRP_CCU_CCUR (CCU Anomaly).**		
		The value of the error bits for the CCU A is kept in the following DIDs (included in the CCU A monitoring packets): **DID_CCU_A_SA01_RSP_STS_WORD** **DID_CCU_A_SA08_RSP_STS_WORD** **DID_CCU_A_SA11_RSP_STS_WORD** **DID_CCU_A_SA12_RSP_STS_WORD** **DID_CCU_A_SA13_RSP_STS_WORD** **DID_CCU_A_SA16_RSP_STS_WORD** **DID_CCU_A_SA30_RSP_STS_WORD** **NOTE: in case of permanent failures (i.e. if DID_CCU_A_SA11_RSP_STS_WORD is indicating a subsystem error flag condition), the same error will be reported in all the other DIDs for response status words.** **Then, it is enough to check only one of these Status Words.** **The parameters below correspond to DID_CCU_A_SA11_RSP_STS_WORD.**		
		Verify RT message error bit Telemetry **MsgErr DEYC2161**	**= 0 <dec>**	(None)
		Verify RT message error bit Telemetry **Busy DEYC6161**	**= 0 <dec>**	(None)
		Verify RT subsystem flag bit Telemetry **SubSys DEYC7161**	**= 0 <dec>**	(None)
		Verify RT terminal flag bit Telemetry **Term DEYC9161**	**= 0 <dec>**	(None)
5		*Verify CCU A valves actuation status*		Next Step: 6

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify State of Valve 1 arming relay Telemetry **Arm_V103** **KM110300**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 1 actuated i.e. active output detected (direction of actuation is specified V1 polarity) Telemetry **Actuated_V103** **KM112300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 open or close command rejected Telemetry **OpCl_TCREJ_V103** **KM113300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 arm command rejected Telemetry **Arm_TCREJ_V103** **KM114300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 arm deactivated by timer Telemetry **dis_TCREJ_V103** **KM115300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify State of Valve 2 arming relay Telemetry **Arm_V501** **KM120300**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 2 actuated Telemetry **Actuated_V501** **KM122300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 open or close command rejected Telemetry **OpCl_TCREJ_V501** **KM123300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 Arm command rejected Telemetry **Arm_TCREJ_V501** **KM124300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 Arm deactivated by timer Telemetry **dis_TCREJ_V501** **KM125300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify State of Valve 3 arming relay Telemetry **Arm_V504** **KM130300**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 3 actuated Telemetry **Actuated_V504** **KM132300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 open or close command rejected Telemetry **OpCl_TCREJ_V504** **KM133300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 Arm command rejected Telemetry **Arm_TCREJ_V504** **KM134300**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 Arm deactivated by timer Telemetry **dis_TCREJ_V504** **KM135300**	**= NOT DETECTED**	AND=ZAZ9K999
6		*Verify CCU A DLCM status*		Next Step: 7
		Verify State of DLCM heater arming relay **DLCMHArm_st A** **KM037300**	**= OFF**	AND=ZAZ9L999
		Verify State of DLCM heater **DLCMheat_stat A** **KM034300**	**= OFF**	AND=ZAZ9L999
		Verify Synchronization to frame failed in DLCM Telemetry **DLCMsync_fail A** **KM036300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Inconsistence in time counters detected Telemetry **TimeCntr_Inc A** **KM035300**	**= NOT DETECTED**	AND=ZAZ9L999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify DLCM On command rejected Telemetry **DLCMcmdON_rj A KM033300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM Arm command rejected Telemetry **DLCMcmdARM_rj A KM032300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM heater arm deactivated by timer Telemetry **DLCMHtARMdist A KM031300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM heater arm deactivated during heating Telemetry **DLCMhtARMdish A KM030300**	**= NOT DETECTED**	AND=ZAZ9L999
7		*Verify CCU A Command Failures*		Next Step: 8
		Verify RTU reported format error in received or transmit message Telemetry **RTU_fmt_err A KM027300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Undefined data word content detected Telemetry **SA1R_failure A KM026300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Undefined word count or data word content detected (11 R), or Data wrap-around, Configurate RTU or Read RTU configuration command rejected Telemetry **SA11_30R_fail A KM025300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Execution of Monitoring sequence, Data wrap-around, Read RTU configuration or Configurate RTU command aborted Telemetry **Exe_Abort A KM024300**	**= NOT DETECTED**	AND=ZAZ9L999
8		*Verify CCU A sequencers status*		Next Step: 9
		Verify State of DLCM sequencer (execution phase) **DLCM_stat A KM022300**	**= Idle**	AND=ZAZ9L999
		Verify Telemetry **MonSeq_stat MA KM621300**	**= ACTIVE**	(None)
		Verify State of Monitoring sequencer Telemetry reported in HK is replaced by the TM parameter reported in monitoring packet. **The reason is HK TM parameter MonSeq_stat A KM021300 is toggling between ACTIVE and NO ACIVE**		
		Verify Pre- and Post-Calibration (used in DLCM) **Pre_post_cal A KM028300**	**= Pre-calib**	AND=ZAZ9L999
		Verify State of configuration arm Telemetry **ConfArm_stat A KM038300**	**= OFF**	AND=ZAZ9L999
9		*Verify CCU A internal voltage*		Next Step: 10
		Verify CCU internal -15V status **CCU_Vol_stat A KM048300**	**= OK**	AND=ZAZ9L999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
10		*Verify CCU A measurements*		Next Step: 11
		Verify Current state of Meas. Average control bit **MeasAvrg_st A KM046300**	**= ENABLED**	AND=ZAZ9L999
		Verify Underflow error during measurement detected **MeasUnflow_st A KM045300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify AD-converter latchup during measurement detected **ADC_latchup A KM044300**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Number of AD-converter latchups since CCU power up **ADC_latchuCnt A KM040300**	**= 0 <dec>**	AND=ZAZ9L999
11		*Verify switch status of CCU B*		Next Step: 12
		Verify CCU B (LCL38) line status Telemetry **Ccu_B_L38_S WMA2A565**	**= ON**	AND=ZAZ9L999
		Verify Telemetry **Ccu_B_L38_I WMA06565**	**>= 0.10 A <= 0.20 A**	AND=ZAZ9L999
12		*Verify CCU B status on the 1553 S/C bus*		Next Step: 13
		Verify Telemetry **CCUB_OnOff DED41161**	**= ON**	AND=ZAZ9L999
		Verify Telemetry **CCUB_DeadAlive DED42161**	**= Alive**	AND=ZAZ9L999
		Verify Telemetry **CCUB_WellSickTC DED43161**	**= Well**	AND=ZAZ9L999
		Verify Telemetry **CCUB_WellSickTM DED44161**	**= Well**	AND=ZAZ9L999
		Verify Telemetry **CCUB_ValidInval DED45161**	**= Valid**	AND=ZAZ9L999
		Verify Telemetry **CCUB_VitalNonV DED6G161**	**= NonVital**	AND=ZAZ9L999
		Verify Telemetry **CCUB_NomRed DED6H161**	**= NOMINAL**	AND=ZAZ9L999
13		*Verify CCU B status in the UIU table*		Next Step: 14
		Verify Telemetry **CcuBFuncSts DEL96171**	**= On**	AND=ZAZ9L999
14		*Check no CCU B RT communication errors*		Next Step: 15

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The CCU RT reports the following error flags in the MIL STD-1553B Status Words: **- RT message error bit: set by the RT upon detection of an error in the message or an illegal message identification.** **- RT busy bit: indicates that the RT or subsystem is unable to move data to or from the subsystem in compliance with thte BC command.** **- RT subsystem flag bit: indicates a subsystem fault condition, and alert the BC to potentially invalid data.** **- RT terminal flag bit: indicates a RT fault condition.** **These RT error bits are not supported by DLL FDIR mechanisms. Thus, if a permanent error is reported on one of these bits, this could indicate a failure in the RT or the CCU, and a recovery action should be taken by calling the contingency procedure H_CRP_CCU_CCUR (CCU Anomaly).**		
		The value of the error bits for the CCU B is kept in the following DIDs (included in the CCU B monitoring packets): **DID_CCU_B_SA01_RSP_STS_WORD** **DID_CCU_B_SA08_RSP_STS_WORD** **DID_CCU_B_SA11_RSP_STS_WORD** **DID_CCU_B_SA12_RSP_STS_WORD** **DID_CCU_B_SA13_RSP_STS_WORD** **DID_CCU_B_SA16_RSP_STS_WORD** **DID_CCU_B_SA30_RSP_STS_WORD** **NOTE: in case of permanent failures (i.e. if DID_CCU_B_SA11_RSP_STS_WORD is indicating a subsystem error flag condition), the same error will be reported in all the other DIDs for response status words.** **Then, it is enough to check only one of these Status Words.** **The parameters below correspond to DID_CCU_B_SA11_RSP_STS_WORD.**		
		Verify RT message error bit Telemetry **MsgErr DEYK2161**	**= 0 <dec>**	(None)
		Verify RT busy bit Telemetry **Busy DEYK6161**	**= 0 <dec>**	(None)
		Verify RT subsystem flag bit Telemetry **SubSys DEYK7161**	**= 0 <dec>**	(None)
		Verify RT terminal flag bit Telemetry **Term DEYK9161**	**= 0 <dec>**	(None)
15		*Verify CCU B valves actuation status*		Next Step: 16

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify State of Valve 1 arming relay Telemetry **Arm_V106** **KM110301**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 1 actuated i.e. active output detected (direction of actuation is specified by Valve 1 polarity) Telemetry **Actuated_V106** **KM112301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 open or close command rejected Telemetry **OpCl_TCREJ_V106** **KM113301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 arm command rejected Telemetry **Arm_TCREJ_V106** **KM114301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 1 arm deactivated by timer Telemetry **dis_TCREJ_V106** **KM115301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify State of Valve 2 arming relay Telemetry **Arm_V503** **KM120301**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 2 actuated Telemetry **Actuated_V503** **KM122301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 open or close command rejected Telemetry **OpCl_TCREJ_V503** **KM123301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 Arm command rejected Telemetry **Arm_TCREJ_V503** **KM124301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 2 Arm deactivated by timer Telemetry **dis_TCREJ_V503** **KM125301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify State of Valve 3 arming relay Telemetry **Arm_V505** **KM130301**	**= DISARMED**	AND=ZAZ9K999
		Verify Valve 3 actuated Telemetry **Actuated_V505** **KM132301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 open or close command rejected Telemetry **OpCl_TCREJ_V505** **KM133301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 Arm command rejected Telemetry **Arm_TCREJ_V505** **KM134301**	**= NOT DETECTED**	AND=ZAZ9K999
		Verify Valve 3 Arm deactivated by timer Telemetry **dis_TCREJ_V505** **KM135301**	**= NOT DETECTED**	AND=ZAZ9K999
16		*Verify CCU B DLCM status*		Next Step: 17
		Verify State of DLCM heater arming relay Telemetry **DLCMHArm_st B** **KM037301**	**= OFF**	AND=ZAZ9L999
		Verify State of DLCM heater Telemetry **DLCMheat_stat B** **KM034301**	**= OFF**	AND=ZAZ9L999
		Verify Synchronization to frame failed in DLCM **DLCMsync_fail B** **KM036301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Inconsistence in time counters detected **TimeCntr_Inc B** **KM035301**	**= NOT DETECTED**	AND=ZAZ9L999

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify DLCM On command rejected Telemetry **DLCMcmdON_rj B KM033301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM Arm command rejected Telemetry **DLCMcmdARM_rj B KM032301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM heater arm deactivated by timer Telemetry **DLCMHtARMdist B KM031301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify DLCM heater arm deactivated during heating **DLCMhtARMdish B KM030301**	**= NOT DETECTED**	AND=ZAZ9L999
17		*Verify CCU B Command Failures*		Next Step: 18
		Verify RTU reported format error in received or transmit message Telemetry **RTU_fmt_err B KM027301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Undefined data word content detected Telemetry **SA1R_failure B KM026301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Undefined word count or data word content detected (11 R), or Data wrap-around, Configurate RTU or Read RTU configuration command rejectedTelemetry **SA11_30R_fail B KM025301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Execution of Monitoring sequence, Data wrap-around, Read RTU configuration or Configurate RTU command aborted Telemetry **Exe_Abort B KM024301**	**= NOT DETECTED**	AND=ZAZ9L999
18		*Verify CCU B sequencers status*		Next Step: 19
		Verify State of DLCM sequencer Telemetry **DLCM_stat B KM022301**	**= Idle**	AND=ZAZ9L999
		Verify Telemetry **MonSeq_stat MB KM621301**	**= ACTIVE**	(None)
		Verify State of Monitoring sequencer Telemetry reported in HK is replaced by the TM parameter reported in monitoring packet. **The reason is HK TM parameter MonSeq_stat A KM021301 is toggling between ACTIVE and NO ACTIVE**		
		Verify Pre- or Post-Calibration (used in DLCM) **Pre_post_cal B KM028301**	**= Pre-calib**	AND=ZAZ9L999
		Verify State of configuration arm Telemetry **ConfArm_stat B KM038301**	**= OFF**	AND=ZAZ9L999
19		*Verify CCU B internal voltage*		Next Step: 20
		Verify CCU internal -15V status Telemetry **CCU_Vol_stat B KM048301**	**= OK**	AND=ZAZ9L999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
20		*Verify CCU B measurements*		Next Step: 21
		Verify Current state of Meas. Average control bit **MeasAvrg_st B KM046301**	**= ENABLED**	AND=ZAZ9L999
		Verify Underflow error during measurement detected **MeasUnflow_st B KM045301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify AD-converter latchup during measurement detected **ADC_latchup B KM044301**	**= NOT DETECTED**	AND=ZAZ9L999
		Verify Number of AD-converter latchups since CCU power up **ADC_latchuCnt B KM040301**	**= 0 <dec>**	AND=ZAZ9L999
21		*S/C mode is Launch?*		Next Step: False 22 True 27
		Verify Telemetry **CurrentMode DEL34170**	**= LaunchMode**	(None)
22		*S/C mode is Sun?*		Next Step: True 23 False 26
		Verify Telemetry **CurrentMode DEL34170**	**= SunAcquisition**	(None)
23		*Previous S/C mode is Launch?*		Next Step: True 24 False 25
		Verify Telemetry **PrevMode DEL35170**	**= LaunchMode**	(None)
24		*Valves status verification in SUN after separation Mode*		Next Step: END
24.1		*Valves CCU A verification*		□
		Verify VS103 Status monitoring ; VS1 (A) **Valv_Stat_VS103 KM269302**	**= OPEN**	AND=ZAZ9K999
		Verify VS501 Status monitoring ; VS2 (A) **Valv_Stat_VS501 KM270302**	**= OPEN**	AND=ZAZ9K999
		Verify VS504 Status monitoring ; VS3 (A) **Valv_Stat_VS504 KM271302**	**= OPEN**	AND=ZAZ9K999
24.2		*Valves CCU B verification*		□

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify VS106 Status monitoring ; VS1 (B) **Valv_Stat_VS106 KM269303**	**= OPEN**	AND=ZAZ9K999
		Verify VS503 Status monitoring ; VS2 (B) **Valv_Stat_VS503 KM270303**	**= OPEN**	AND=ZAZ9K999
		Verify VS505 Status monitoring ; VS3 (B) **Valv_Stat_VS505 KM271303**	**= OPEN**	AND=ZAZ9K999
25		*Valves status verification in SUN otherwise Mode*		Next Step: END
		Valves Status same as during Routine phase		
25.1		*Valves CCU A verification*		
		Verify VS103 Status monitoring ; VS1 (A) **Valv_Stat_VS103 KM269302**	**= OPEN**	AND=ZAZ9K999
		Verify VS501 Status monitoring ; VS2 (A) **Valv_Stat_VS501 KM270302**	**= OPEN**	AND=ZAZ9K999
		Verify VS504 Status monitoring ; VS3 (A) **Valv_Stat_VS504 KM271302**	**= CLOSED**	AND=ZAZ9K999
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V103 KM111300**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V501 KM121300**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V504 KM131300**	**= Closed**	AND=ZAZ9K999
25.2		*Valves CCU B verification*		
		Verify VS106 Status monitoring ; VS1 (B) **Valv_Stat_VS106 KM269303**	**= OPEN**	AND=ZAZ9K999
		Verify VS503 Status monitoring ; VS2 (B) **Valv_Stat_VS503 KM270303**	**= OPEN**	AND=ZAZ9K999
		Verify VS505 Status monitoring ; VS3 (B) **Valv_Stat_VS505 KM271303**	**= CLOSED**	AND=ZAZ9K999
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V106 KM111301**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V503 KM121301**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V505 KM131301**	**= Closed**	AND=ZAZ9K999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
26		*Valves status verification in Routine phase*		Next Step: END
26.1		*Valves CCU A verification*		
		Verify VS103 Status monitoring ; VS1 (A) **Valv_Stat_VS103** **KM269302**	**= OPEN**	AND=ZAZ9K999
		Verify VS501 Status monitoring ; VS2 (A) **Valv_Stat_VS501** **KM270302**	**= OPEN**	AND=ZAZ9K999
		Verify VS504 Status monitoring ; VS3 (A) **Valv_Stat_VS504** **KM271302**	**= CLOSED**	AND=ZAZ9K999
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V103** **KM111300**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V501** **KM121300**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V504** **KM131300**	**= Closed**	AND=ZAZ9K999
26.2		*Valves CCU B verification*		
		Verify VS106 Status monitoring ; VS1 (B) **Valv_Stat_VS106** **KM269303**	**= OPEN**	AND=ZAZ9K999
		Verify VS503 Status monitoring ; VS2 (B) **Valv_Stat_VS503** **KM270303**	**= OPEN**	AND=ZAZ9K999
		Verify VS505 Status monitoring ; VS3 (B) **Valv_Stat_VS505** **KM271303**	**= CLOSED**	AND=ZAZ9K999
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V106** **KM111301**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V503** **KM121301**	**= Open**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V505** **KM131301**	**= Closed**	AND=ZAZ9K999
27		*Valves status verification in Launch Mode*		Next Step: END

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		At launch, the cryostat will be with the following state of commandable valves: **· CLOSED: V103, V106, V501, V503** **· OPEN: V504, V505** **After the cryostat flushing is stopped in the BAF, the ventline (between valves V501, V503, V502, V506, V105, V701, V103, V106, V104, V102, V702 and the filling port) will be closed, and its pressure will increase due to the cryostat warm up. Therefore the line shall be vented from time to time.**		
		The procedure is the follwoing command V501 shall be made upon monitoring of P501 (acquired by the Cryo COTE) when P501 reaches 1.2 bar V501 is OPENED for 8 sec then is CLOSED again. **It is expected that at the time of the first launch attempt, the time elapsed from one opening to another is about 2 hours or more.** **In order to avoid an operation of V501 during the automatic sequence, V501 will be opened and closed as described above at H0 – 20 min.**		
27.1		*Valves CCU A verification*		
		Verify VS103 Status monitoring ; VS1 (A) **Valv_Stat_VS103 KM269302**	**= CLOSED**	AND=ZAZ9K999
		Verify VS501 Status monitoring ; VS2 (A) **Valv_Stat_VS501 KM270302**	**= CLOSED**	AND=ZAZ9K999
		Verify VS504 Status monitoring ; VS3 (A) **Valv_Stat_VS504 KM271302**	**= OPEN**	AND=ZAZ9K999
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V103 KM111300**	**= Closed**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V501 KM121300**	**= Closed**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V504 KM131300**	**= Open**	AND=ZAZ9K999
27.2		*Valves CCU B verification*		
		Verify VS106 Status monitoring ; VS1 (B) **Valv_Stat_VS106 KM269303**	**= CLOSED**	AND=ZAZ9K999
		Verify VS503 Status monitoring ; VS2 (B) **Valv_Stat_VS503 KM270303**	**= CLOSED**	AND=ZAZ9K999
		Verify VS505 Status monitoring ; VS3 (B) **Valv_Stat_VS505 KM271303**	**= OPEN**	AND=ZAZ9K999

CCU TM TOPE check
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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify State of Valve 1 polarity relays Telemetry **Polarity_V106 KM111301**	**= Closed**	AND=ZAZ9K999
		Verify State of Valve 2 polarity relays Telemetry **Polarity_V503 KM121301**	**= Closed**	AND=ZAZ9K999
		Verify State of Valve 3 polarity relays Telemetry **Polarity_V505 KM131301**	**= Open**	AND=ZAZ9K999
		End of Procedure		