Verify configuration matrices for FDIR
File: H_FCP_DHS_3060.xls
Author: cmevi-hp

Procedure Summary

Objectives

This procedure describes the steps needed to acquire the status of the following sets of flags (controlling the activity on the 1553 S/C bus):

- Remote Terminal Address, RTA, configuration matrix: settings specific for each terminal (nominal and redundant separately);

- Remote Terminal, RT, configuration matrix: settings specific for each logical unit (nominal and redundant together);

- Bus configuration matrix: settings for the entire bus protocol handling.

Summary of Constraints

n/a

Spacecraft Configuration

Start of Procedure

CDMU in default configuration, that is:
- PM A or B ON (nominally A)
- TM Encoder/OBT A or B active (nominally A)
- RM A and B enabled
- MM A and B ON

End of Procedure

CDMU in default configuration, that is:
- PM A or B ON (nominally A)
- TM Encoder/OBT A or B active (nominally A)
- RM A and B enabled
- MM A and B ON

Reference File(s)

Input Command Sequences

Output Command Sequences

Referenced Displays

ANDs	GRDs	SLDs
ZAZAF999		(None)
ZAZAP999		
ZAZAG999		
ZAZAH999		
ZAZAI999		

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Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
07/11/07		1	Created	cmevi-hp	
10/06/08	1	2	TC Flag and Seq Properly changed	S. Manganelli	
14/11/08		3	Procedure updated according to latest version received from industry on 29/09/2008	cmevi-hp	
14/11/08	2	4	The procedure update from industry has been received on 19/09/2008 and not 29/09/2008	cmevi-hp	

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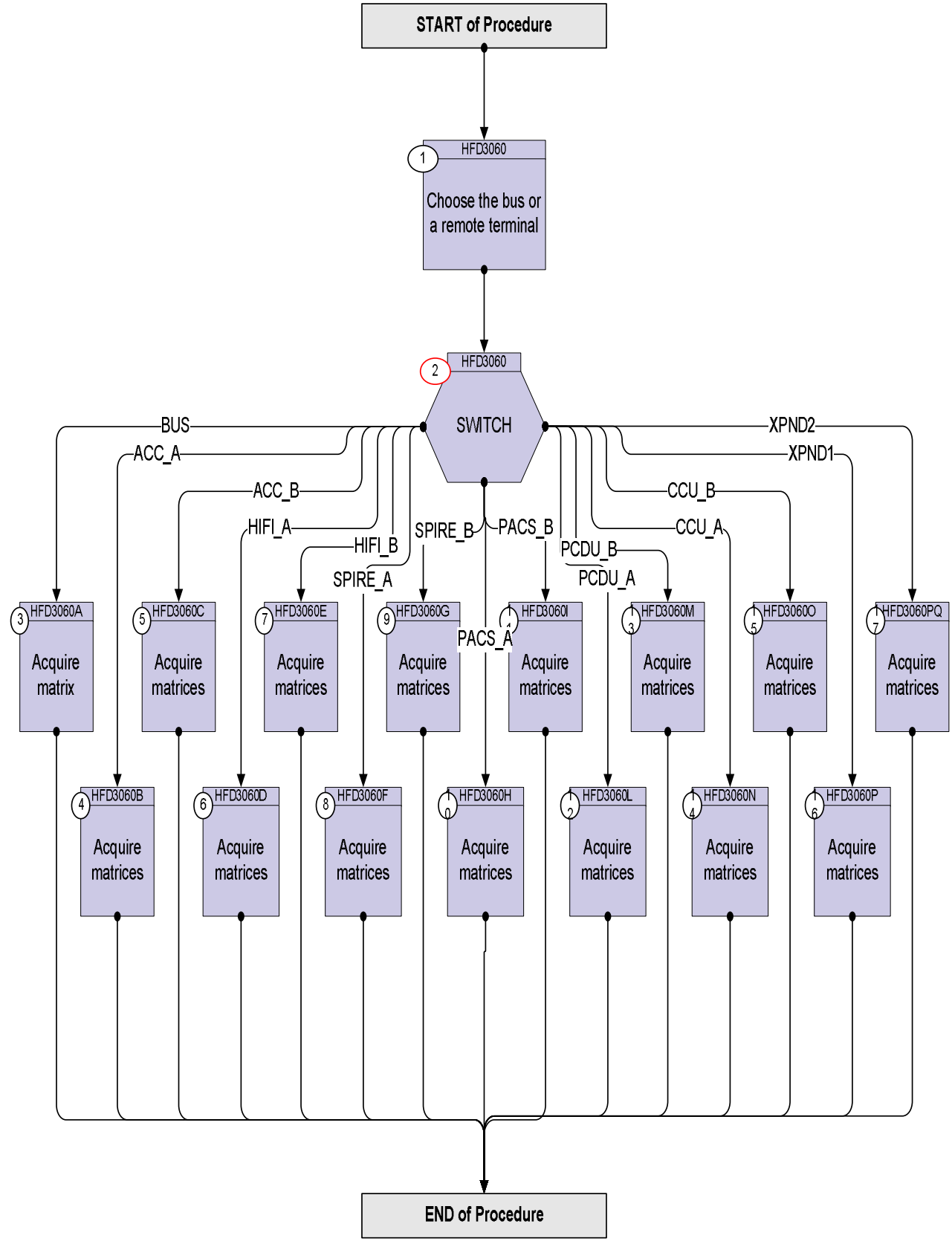
Procedure Flowchart Overview



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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Beginning of Procedure		
		TC Seq. Name :HFD3060 (Dummy sequence) *TimeTag Type:* *Sub Schedule ID:* □		
1		*Choose the bus or a remote terminal*		Next Step: 2
2		*SWITCH*		Next Step: BUS 3 ACC_A 4 ACC_B 5 HIFI_A 6 HIFI_B 7 SPIRE_A 8 SPIRE_B 9 PACS_A 10 PACS_B 11 PCDU_A 12 PCDU_B 13 CCU_A 14 CCU_B 15 XPND1 16
				XPND2 17
		TC Seq. Name :HFD3060A (Acquire BUS matrix) *TimeTag Type:* *Sub Schedule ID:* □		
3		*Acquire matrix*		Next Step: END
		Bus configuration matrix **Nominal values are provided**		
		The DLL FDIR can change the Active Bus flag in case of reconfiguration to the other Bus, provided the other Bus is flagged as Healthy.		
		Verify Telemetry **Active_Bus_A_B DEFJ1160**	**= BUS_A**	AND=ZAZAF999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The Health flag of Bus A or B setting is taken into account after an on onboard detection of an error during communication with an RT. The BSW sets the flag of the Active Bus to 'Unhealthy' and the DLL FDIR sequence is triggered: **- In case the other Bus is also flagged as 'Unhealthy' a CDMU level 3 error is raised.** **- In case the other Bus is flagged as 'Healthy' provided the Data Wrap Around Tests for all RTs on both Bus returned no errors the Active Bus Health flag is reset to 'Healthy'. If the results of the Data Wrap Around Tests for all RTs on both Bus differ, other Bus is selected as Active.**		
		Verify Telemetry **BusA_HealthySts DEFJ2160**	**= Healthy**	AND=ZAZAF999
		Verify Telemetry **BusB_HealthySts DEFJ3160**	**= Healthy**	AND=ZAZAF999
		The SDB FDIR flag enables/disables both the DLL and TFL FDIR. It is strongly recommended never to disable it, as no more onboard SDB error detection would occur.		
		Verify Telemetry (only set by Ground) **SDB_FDIR DEFJ4160**	**= ENABLED**	AND=ZAZAF999
		TC Seq. Name :HFD3060B (Acquire ACC_A matrix) *TimeTag Type:* *Sub Schedule ID:*		
4		*Acquire matrices*		Next Step: END
		RTA configuration matrix **Nominal values are provided**		
		The TFL-TM FDIR flag enables to disable for a specific RT the TFL-TM FDIR. **Note this flag is not linked to the SDB FDIR flag, i.e. it will not be modified when the global flag is set or reset. Therefore in case for a RT the TFL-TM FDIR was disabled, then the SDB global FDIR was disabled and subsequently enabled, the particular RT will still have its related TFL-TM FDIR disabled.**		
		Verify Telemetry **ACCA_TFLTM DEF6L160**	**= ENABLED**	AND=ZAZAP999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		The RTA On/Off status reflects the power status of the specified RT. Thus in case an RT is definitely failed, but cannot be turned OFF (eg. because a standard LCL has failed, or because the unit is powered via FCL) the status will still be ON. **In that case the RTA Dead/Alive status allows to flag it as 'Dead' thus taking precedence over the erroneous On/Off status. This status can only be set by Ground.**		
		Verify Telemetry **ACCA_On_Off DEF6G160**	**= ON**	AND=ZAZAG999
		Verify Telemetry **ACCA_Dead_Alive DEF6H160**	**= Alive**	AND=ZAZAG999
		The RTA_Well_TC/Sick_TC reflects if the last TC packet transfer was successful or not. It is set the first time an error is detected. The same TC is then re-sent. If after the 2nd attempt the transfer has again failed and the RT is non Vital, the relevant RT FDIR will be triggered. In case of a Vital RT or if several non Vital RTs are set to 'Sick TC' a CDMU level 3 error is raised. **Resetting the status to 'Well TC' can only be achieved by TC.**		
		Verify Telemetry **ACCAWell_SickTC DEF6Z160**	**= Well**	AND=ZAZAG999
		The RTA_Well_TM/Sick_TM reflects if more than the expected minimum number of TM packets for that RT have been received over a certain period of time specific to that RT. Both the minimum number and the period are part of the on board DB. **It is set the first time an error is detected, to reset the status to 'Well TM' can only be achieved by TC.**		
		Verify Telemetry **ACCAWell_SickTM DEF6J160**	**= Well**	AND=ZAZAG999
		The RTA Valid/Invalid status describes the RT availability. A RT will typically be labelled invalid when it is recognised to be reconfiguring. **The RT *Invalid* to RT *Valid* transition is only performed upon dedicated TC.** **The only exception is : a Vital Active RT is declared temporarily *Invalid* during Vital RT FDIR sequence.**		
		Verify Telemetry **ACCAValid_Inval DEF6K160**	**= Valid**	AND=ZAZAG999
		The RTA On/Off, Dead/Alive and Valid/Invalid statuses are used by the TFL FDIR. Only the RTs which are On, Alive and Valid will be submitted to the TFL TC FDIR. For the TFL TM FDIR in addition the RTA_Well_TM/Sick_TM needs to be set at 'Well TM' for the FDIR to take place.		
		RT configuration matrix **Nominal values are provided**		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		To declare a logical unit (thus both nominal and redundant RTA) as Vital results in specific recovery actions. Currently, only the ACC is identified as a Vital RT; confirmed communication failure with a Vital RT (on both A & B 1553 Buses) leads to a CDMU level 3 reconfiguration. Vital/Non Vital status is maintained by the Ground.		
		Verify Telemetry **ACC_Vit_NoVit DEFDG160**	**= Vital**	AND=ZAZAG999
		A part of the DLL FDIR, in case the failed RT is a Vital one, the first time round the RT is declared 'Invalid' for N seconds and the Vital Loop counter is incremented by one, ie set to 2. If after these N seconds the Bus anomaly is still present the vital RT is declared Invalid, the Redundant vital RT is now to be used and the Vital Loop counter is incremented by one, ie set to 3. If the Bus anomaly is still present with the redundant vital RT, the DLL FDIR will raise a CDMU level 3 error. This is only relevant for Vital RTs, thus at the moment only ACCs.		
		Verify Telemetry **ACC_VitRT_Cnt DEFDJ160**	**= 1 <dec>**	AND=ZAZAG999
		The RT Nominal/Redundant flag reflects which RT is active. It can be set both by TC and FDIR.		
		Verify Telemetry **ACC_No_Re_RTA DEFDH160**	**= NOMINAL**	AND=ZAZAG999
		Unlike the TC retry, which is always performed, the TM retry attempt can be enabled or disabled by the Ground. This is only relevant for intelligent RTs, thus not for PCDU, XPNDs and CCUs .		
		Verify Telemetry **ACC_TMRetryOnOf DEFDZ160**	**= ON**	AND=ZAZAG999
		TC Seq. Name :HFD3060C (Acquire ACC_B matrix) *TimeTag Type:* *Sub Schedule ID:*		
5		*Acquire matrices*		Next Step: END
		RTA configuration matrix		

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **ACCB_TFLTM** **DEF76160**		AND=ZAZAP999
		Verify Telemetry **ACCB_On_Off** **DEF71160**		(None)
		Verify Telemetry **ACCB_Dead_Alive** **DEF72160**		(None)
		Verify Telemetry **ACCBWell_SickTC** **DEF73160**		(None)
		Verify Telemetry **ACCBWell_SickTM** **DEF74160**		(None)
		Verify Telemetry **ACCBValid_Inval** **DEF75160**		AND=ZAZAG999
		RT configuration matrix		
		Verify Telemetry **ACC_VitRT_Cnt** **DEFDJ160**		AND=ZAZAG999
		Verify Telemetry **ACC_Vit_NoVit** **DEFDG160**		(None)
		Verify Telemetry **ACC_No_Re_RTA** **DEFDH160**		(None)
		Verify Telemetry **ACC_TMRetryOnOf** **DEFDZ160**		(None)
		TC Seq. Name :HFD3060D (Acquire HIFI_A matrix) *TimeTag Type:* *Sub Schedule ID:* □		
6		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **HIFIA_TFLTM** **DEDZL161**		AND=ZAZAP999
		Verify Telemetry **HIFIA_OnOff** **DEDZG161**		(None)
		Verify Telemetry **HIFIA_DeadAlive** **DEDZH161**		(None)
		Verify Telemetry **HIFIA_WellSicTC** **DEDZZ161**		(None)
		Verify Telemetry **HIFIA_WellSicTM** **DEDZJ161**		(None)

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **HIFIA_ValidInv** **DEDZK161**		AND=ZAZAG999
		RT configuration matrix		
		Verify Telemetry **HIFI_VitalCnt** **DED4J161**		AND=ZAZAH999
		Verify Telemetry **HIFI_VitalNonV** **DED4G161**		(None)
		Verify Telemetry **HIFI_NomRed** **DED4H161**		(None)
		Verify Telemetry **HIFI_TmRetry** **DED4Z161**		(None)
		TC Seq. Name :HFD3060E (Acquire HIFI_B matrix) *TimeTag Type:* *Sub Schedule ID:*		
7		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **HIFIB_TFLTM** **DED16161**		AND=ZAZAP999
		Verify Telemetry **HIFIB_OnOff** **DED11161**		(None)
		Verify Telemetry **HIFIB_DeadAlive** **DED12161**		(None)
		Verify Telemetry **HIFIB_WellSicTC** **DED13161**		(None)
		Verify Telemetry **HIFIB_WellSicTM** **DED14161**		(None)
		Verify Telemetry **HIFIB_ValidInv** **DED15161**		AND=ZAZAG999
		RT configuration matrix		
		Verify Telemetry **HIFI_VitalCnt** **DED4J161**		(None)
		Verify Telemetry **HIFI_VitalNonV** **DED4G161**		(None)
		Verify Telemetry **HIFI_NomRed** **DED4H161**		(None)

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **HIFI_TmRetry** **DED4Z161**		AND=ZAZAH999
		TC Seq. Name :HFD3060F (Acquire SPIRE_A matrix) *TimeTag Type:* *Sub Schedule ID:*		
8		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **SPIREA_TFLTM** **DED1L161**		AND=ZAZAP999
		Verify Telemetry **SPIREA_OnOff** **DED1G161**		(None)
		Verify Telemetry **SPIREA_DeadAliv** **DED1H161**		(None)
		Verify Telemetry **SPIREA_WellSiTC** **DED1Z161**		(None)
		Verify Telemetry **SPIREA_WellSiTM** **DED1J161**		(None)
		Verify Telemetry **SPIREA_ValidInv** **DED1K161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **SPIRE_VitalCnt** **DED51161**		(None)
		Verify Telemetry **SPIRE_VitalNonV** **DED52161**		(None)
		Verify Telemetry **SPIRE_NomRed** **DED53161**		(None)
		Verify Telemetry **SPIRE_TmRetry** **DED54161**		AND=ZAZAH999
		TC Seq. Name :HFD3060G (Acquire SPIRE_B matrix) *TimeTag Type:* *Sub Schedule ID:*		
9		*Acquire matrices*		Next Step: END

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		RTA configuration matrix		
		Verify Telemetry **SPIREB_TFLTM** **DED26161**		AND=ZAZAP999
		Verify Telemetry **SPIREB_OnOff** **DED21161**		(None)
		Verify Telemetry **SPIREB_DeadAliv** **DED22161**		(None)
		Verify Telemetry **SPIREB_WellSiTC** **DED23161**		(None)
		Verify Telemetry **SPIREB_WellSiTM** **DED24161**		(None)
		Verify Telemetry **SPIREB_ValidInv** **DED25161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **SPIRE_VitalCnt** **DED51161**		(None)
		Verify Telemetry **SPIRE_VitalNonV** **DED52161**		(None)
		Verify Telemetry **SPIRE_NomRed** **DED53161**		(None)
		Verify Telemetry **SPIRE_TmRetry** **DED54161**		AND=ZAZAH999
		TC Seq. Name :HFD3060H (Acquire PACS_A matrix) *TimeTag Type:* *Sub Schedule ID:* □		
10		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **PACSA_TFLTM** **DED2L161**		AND=ZAZAP999
		Verify Telemetry **PACSA_OnOff** **DED2G161**		(None)
		Verify Telemetry **PACSA_DeadAliv** **DED2H161**		(None)
		Verify Telemetry **PACSA_WellSiTC** **DED2Z161**		(None)

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **PACSA_WellSiTM** **DED2J161**		(None)
		Verify Telemetry **PACSA_ValidInv** **DED2K161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **PACS_VitalCnt** **DED5J161**		(None)
		Verify Telemetry **PACS_VitalNonV** **DED5G161**		(None)
		Verify Telemetry **PACS_NomRed** **DED5H161**		(None)
		Verify Telemetry **PACS_TmRetry** **DED5Z161**		AND=ZAZAH999
		TC Seq. Name :HFD3060I (Acquire PACS_B matrix) *TimeTag Type:* *Sub Schedule ID:* □		
11		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **PACSB_TFLTM** **DED36161**		AND=ZAZAP999
		Verify Telemetry **PACSB_OnOff** **DED31161**		(None)
		Verify Telemetry **PACSB_DeadAliv** **DED32161**		(None)
		Verify Telemetry **PACSB_WellSiTC** **DED33161**		(None)
		Verify Telemetry **PACSB_WellSiTM** **DED34161**		(None)
		Verify Telemetry **PACSB_ValidInv** **DED35161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **PACS_VitalCnt** **DED5J161**		(None)
		Verify Telemetry **PACS_VitalNonV** **DED5G161**		(None)

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **PACS_NomRed** **DED5H161**		(None)
		Verify Telemetry **PACS_TmRetry** **DED5Z161**		AND=ZAZAH999
		TC Seq. Name :HFD3060L (Acquire PCDU_A matrix) *TimeTag Type:* *Sub Schedule ID:*		
12		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **PCDUA_TFLTM** **DEFAL160**		AND=ZAZAP999
		Verify Telemetry **PCDUA_On_Off** **DEFAG160**		(None)
		Verify Telemetry **PCDUADead_Alive** **DEFAH160**		(None)
		Verify Telemetry **PCDUAWellSickTC** **DEFAZ160**		(None)
		Verify Telemetry **PCDUAWellSickTM** **DEFAJ160**		(None)
		Verify Telemetry **PCDUA_Val_Inval** **DEFAK160**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **PCDU_VitRT_Cnt** **DEFDK160**		(None)
		Verify Telemetry **PCDU_Vit_NoVit** **DEFDL160**		(None)
		Verify Telemetry **PCDU_No_Re_RTA** **DEFDM160**		AND=ZAZAH999
		TC Seq. Name :HFD3060M (Acquire PCDU_B matrix) *TimeTag Type:* *Sub Schedule ID:*		
13		*Acquire matrices*		Next Step: END

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		RTA configuration matrix		
		Verify Telemetry **PCDUB_TFLTM** **DEFB6160**		AND=ZAZAP999
		Verify Telemetry **PCDUB_On_Off** **DEFB1160**		(None)
		Verify Telemetry **PCDUBDead_Alive** **DEFB2160**		(None)
		Verify Telemetry **PCDUBWellSickTC** **DEFB3160**		(None)
		Verify Telemetry **PCDUBWellSickTM** **DEFB4160**		(None)
		Verify Telemetry **PCDUB_Val_Inval** **DEFB5160**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **PCDU_VitRT_Cnt** **DEFDK160**		(None)
		Verify Telemetry **PCDU_Vit_NoVit** **DEFDL160**		(None)
		Verify Telemetry **PCDU_No_Re_RTA** **DEFDM160**		AND=ZAZAH999
		TC Seq. Name :HFD3060N (Acquire CCU_A matrix) *TimeTag Type:* *Sub Schedule ID:*		
14		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **CCUA_TFLTM** **DED3L161**		AND=ZAZAP999
		Verify Telemetry **CCUA_OnOff** **DED3G161**		(None)
		Verify Telemetry **CCUA_DeadAlive** **DED3H161**		(None)
		Verify Telemetry **CCUA_WellSickTC** **DED3Z161**		(None)
		Verify Telemetry **CCUA_WellSickTM** **DED3J161**		(None)

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry **CCUA_ValidInval** **DED3K161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **CCUA_VitalCnt** **DED61161**		(None)
		Verify Telemetry **CCUA_VitalNonV** **DED62161**		(None)
		Verify Telemetry **CCUA_NomRed** **DED63161**		AND=ZAZAH999
		TC Seq. Name :HFD3060O (Acquire CCU_B matrix) *TimeTag Type:* *Sub Schedule ID:* □		
15		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **CCUB_TFLTM** **DED46161**		AND=ZAZAP999
		Verify Telemetry **CCUB_OnOff** **DED41161**		(None)
		Verify Telemetry **CCUB_DeadAlive** **DED42161**		(None)
		Verify Telemetry **CCUB_WellSickTC** **DED43161**		(None)
		Verify Telemetry **CCUB_WellSickTM** **DED44161**		(None)
		Verify Telemetry **CCUB_ValidInval** **DED45161**		AND=ZAZAH999
		RT configuration matrix		
		Verify Telemetry **CCUB_VitalCnt** **DED6J161**		(None)
		Verify Telemetry **CCUB_VitalNonV** **DED6G161**		(None)
		Verify Telemetry **CCUB_NomRed** **DED6H161**		AND=ZAZAH999

Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		TC Seq. Name :HFD3060P (Acquire XPND1 matrix) *TimeTag Type:* *Sub Schedule ID:*		
16		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **XPND1_TFLTM** **DEFCL160**		AND=ZAZAP999
		Verify Telemetry **XPND1On_Off** **DEFCG160**		(None)
		Verify Telemetry **XPND1Dead_Alive** **DEFCH160**		(None)
		Verify Telemetry **XPND1WellSickTC** **DEFCZ160**		(None)
		Verify Telemetry **XPND1WellSickTM** **DEFCJ160**		(None)
		Verify Telemetry **XPND1Val_Inval** **DEFCK160**		AND=ZAZAI999
		RT configuration matrix		
		Verify Telemetry **XPND1_VitRT_Cnt** **DEFDN160**		(None)
		Verify Telemetry **XPND1_Vit_NoVit** **DEFDP160**		(None)
		Verify Telemetry **XPND1_No_Re_RTA** **DEFDR160**		AND=ZAZAI999
		TC Seq. Name :HFD3060PQ (Acquire XPND2 matrix) *TimeTag Type:* *Sub Schedule ID:*		
17		*Acquire matrices*		Next Step: END
		RTA configuration matrix		
		Verify Telemetry **XPND2_TFLTM** **DEFD6160**		AND=ZAZAP999
		Verify Telemetry **XPND2On_Off** **DEFD1160**		(None)

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		Verify Telemetry **XPND2Dead_Alive**	**DEFD2160**		(None)
		Verify Telemetry **XPND2WellSickTC**	**DEFD3160**		(None)
		Verify Telemetry **XPND2WellSickTM**	**DEFD4160**		(None)
		Verify Telemetry **XPND2Val_Inval**	**DEFD5160**		AND=ZAZAI999
		RT configuration matrix			
		Verify Telemetry **XPND2_VitRT_Cnt**	**DEFDS160**		(None)
		Verify Telemetry **XPND2_Vit_NoVit**	**DEFDT160**		(None)
		Verify Telemetry **XPND2_No_Re_RTA**	**DEFDU160**		AND=ZAZAI999
End of Procedure					