

Roll back to TTR A after TTR switchover
File: H_CRP_DHS_3056.xls
Author: S. Manganelli



Procedure Summary

Objectives

This procedure describes the steps needed to switch to TM encoder/OBT A after a TTR switchover performed on-board following BSW events 56/57/64/65/86/87.

Summary of Constraints

After the TTR roll back Ground has to verify the status of the following entries in Unit In Use (UIU) table, related to TTR components managed by the BSW via the Health Table:

- failure on ICB:
 - > SGM, CPDU and Survival Register
- failure on SPW:
 - > SGM

Failed Survival Register and CPDU entries could be set back to "Not failed" by Ground. It is clear that in case of permanent failure of related BSW component these items cannot be operated anymore and they would set again to "Failed" by ASW.

In order to resume the operations on both the SGMs it is necessary to have both of them as "Not failed" in UIU and align their content as necessary for both BSW and ASW data. Also in this case the operations on SGM are strictly depending on BSW related components (i.e. SPW, ICB have to work correctly).

Moreover, when changing the TM encoder a glitch on the internal PPS lines of the OBT cannot be excluded, possibly causing the BSW to enter in free running mode; for this reason it is necessary to set the CTR (Centr

Spacecraft Configuration

Start of Procedure

TM Encoder/OBT B active;
TM Encoder/OBT A not active and marked as "Failed" in UIU.

End of Procedure

TM Encoder/OBT A active and marked as "Not failed" in UIU table;
TM Encoder/OBT B not active.

Reference File(s)

Input Command Sequences

Output Command Sequences

HRD3056A
HRD3056B
HRD3056C
HRD3056D

Referenced Displays

ANDs GRDs SLDs

Status : Version 4 - Updated
Last Checkin: 25/03/10

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ZAZAI999 (None)
 ZAZAA999
 ZAZAB999
 ZAZAN999
 ZAZAC999

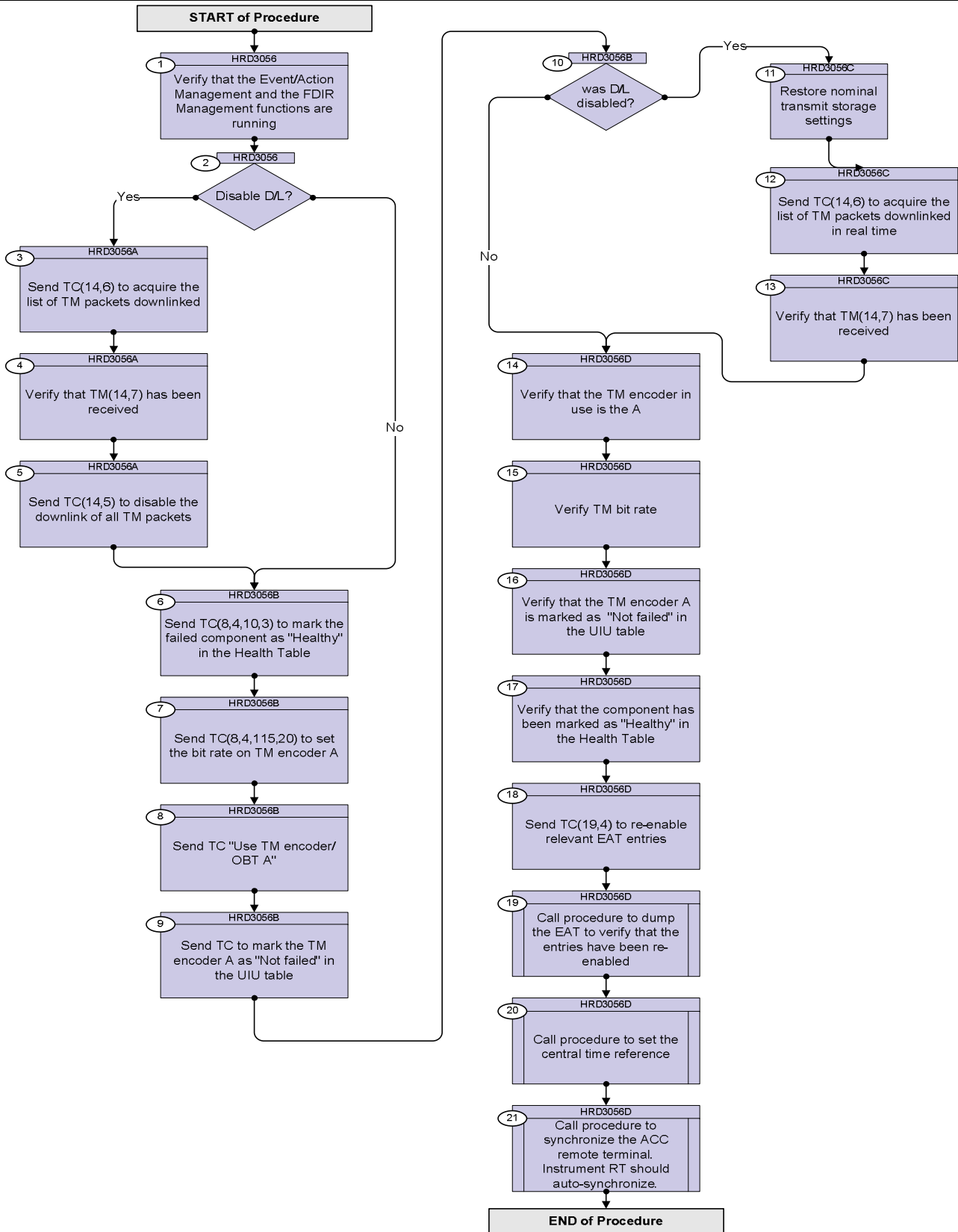
Configuration Control Information

DATE	FOP ISSUE	VERSION	MODIFICATION DESCRIPTION	AUTHOR	SPR REF
14/11/08		1	Created	cmevi-hp	
02/01/09		2	Added comment concerning disabling of downlink at step2, modified TC at step 6 to include the TTR RM Interrupt	S. Manganelli	
11/01/09	2	3	Updated following OBSW 3_8	S. Manganelli	
21/03/09	2.2	3.01	Validation : Swapped steps 7 and 8 Updated following TAS-I inputs 3 march 09	S. Manganelli	
25/03/10	3	4	No change, config control version only	S. Manganelli	

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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 :HRD3056 (Verify functions) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
1		Verify that the Event/Action Management and the FDIR Management functions are running		Next Step: 2
		Verify Telemetry EaSts DEG19170	= Running	AND=ZAZAI999
		Verify Telemetry FdirSts DEG23170	= Running	AND=ZAZAI999
2		Disable D/L?		Next Step: Yes 3 No 6
		Disabling downlink would avoid possible ground reception of incomplete frames / packets but then the procedure must be run in the blind.		
TC Seq. Name :HRD3056A (Disable D/L all) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
3		Send TC(14,6) to acquire the list of TM packets downlinked		Next Step: 4
		When CDMU receives this request, the real time down-linking and SSMM storage status are determined for all telemetry packet (Application ID, Type, Sub-Type) and a report (14,7) is generated.		
		Execute Telecommand RepDownlinkTMStorage TC Control Flags : GBM IL DSE --Y -- -- Subsch. ID : 10 Det. descr. : Report Telemetry Packets Down-linking/ Storage Status	DC141160	
4		Verify that TM(14,7) has been received		Next Step: 5

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Packet Reception Telemetry Packets DownLinking-Storage Status Report (14,7)-1400 Packet Details: APID: 16 Type: 14 Subtype: 7 PI1: PI2:		
		Verify Telemetry N DE042160		(None)
		The following parameters are repeated N times		
		Verify Telemetry APID DE047160		(None)
		Verify Telemetry Type DE043160		(None)
		Verify Telemetry Sub-Type DE046160		(None)
		Verify Telemetry Transmit_Flag DE048160		(None)
		Verify Telemetry Storage_Flag DE049160		(None)
5		Send TC(14,5) to disable the downlink of all TM packets		Next Step: 6
		When CDMU receives this request, the dedicated parameters update and Real Time down-linking and/or SSMM storage shall be performed according to received flags.		
		In the TC(14,5) it is necessary to set the following parameters: <u>N</u> : number of TM packet definition that follow. <u>Application ID</u> : repeated N times, identifier of Application Process from which TM packets Real Time down-linking and/or SSMM storage shall be Enabled/Disabled. <u>Type</u> and <u>Sub-Type</u> (repeated N times)		
		<u>Keep Transmit flag</u> : repeated N times, is the "mask" of the Transmit flag 0 = Update the Transmit flag 1 = Keep current Transmit flag value <u>Transmit flag</u> : repeated N times, can take two values and indicate if down-linking is to be enabled or disabled. 0 = Disabled real-time transmission 1 = Enabled real-time transmission The parameter is ignored if its mask is set.		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		<p>Keep Storage flag: repeated N times, is the "mask" of the Storage flag 0 = Update the Storage flag 1 = Keep current Storage flag value</p> <p>Storage flag: repeated N times, can take two values and indicate if SSMM storage is to be enabled or disabled. 0 = Disabled 1 = Enabled The parameter is ignored if its mask is set.</p>		
		<p>The {Application ID, Type, Sub-Type} set identifies the TM packets to which the Real Time downlinking and/or SSMM storage control shall be applied as follows :</p> <p>If Application ID > 0, Real Time down-linking and/or SSMM storage of all TM packets carrying the selected Application ID shall be Enabled/Disabled according to the Transmit flag and Storage flag values.</p> <p>If Application ID = 0 and Type > 0 (then Sub-Type shall be > 0), Real Time downlinking and/or SSMM storage of all TM packets carrying the selected {Type, Sub-Type} shall be Enabled/Disabled according to the Transmit flag and Storage flag values.</p> <p>If Application ID = 0 and Type = 0, Real Time down-linking and/or SSMM storage of all TM packets shall be Enabled/Disabled according to Transmit flag and Storage flag values.</p> <p>A packet definition with both APID and Type set to 0 have to be the first definition in the TC.</p> <p>In a packet definition, either both Type and Sub-type shall be 0, or none of them shall be 0.</p>		
		<p>In this case the set needs to be the following:</p> <p>N = 1 Application ID = 0 Type = 0 Sub-Type=0 Keep Transmit flag = 0 Transmit flag = 0 Keep Storage flag = 1 Storage flag = 1</p>		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Telecommand SelDownlinkTMStorage	DC140160	
		Command Parameter(s) : N DH019160 Application_ID DH058160 Type DH020160 Sub-Type DH021160 Keep_Transmit DH070160 Transmit_Flag DH059160 Keep_Storage DH071160 Storage_Flag DH060160	1 <dec> (Def) 0 <dec> 0 <dec> 0 <dec> Update DISABLED Keep ENABLED	
		TC Control Flags : GBM IL DSE		
		Subsch. ID : 10 Det. descr. : Select Down-linking/ Storage of Telemetry Packets	--Y -- ---	
TC Seq. Name :HRD3056B (Switch to Encoder A) TimeTag Type: Sub Schedule ID: <input type="checkbox"/>				
6		Send TC(8,4,10,3) to mark the failed component as "Healthy" in the Health Table		Next Step: 7
		In the TC(8,4,10,3) it is necessary to set the following parameters: N: number of components for which the health tables shall be updated. In this case this parameter has to be equal to 1. Parameters repeated N times: COMP: component for which the Health table shall be updated.		
		The components changed in Health Table are the following: - PM COCOS SPW A Timeout/Reconnection failure -> PmSpwTtrRmAA marked "Unhealthy" if active PM is A -> PmSpwTtrRmBA marked "Unhealthy" if active PM is B -> TtrRmSgmA marked "Disabled" - TTR-RM A CROME RT failure -> TtrRmlcbRtA marked "Unhealthy" -> TtrRmlntrpA marked "Unhealthy"		

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch																																												
		<p>Mask for "Component Health" flag: 0=Ignore Flag; 1=Update the status In this case this flag has to be equal to 1.</p> <p>Mask for "Component enable/disable status" flag: 0=Ignore Flag; 1=Update the status In this case this flag has to be equal to 0.</p> <p>Mask for "Health and Status Update" flag: 0=Ignore Flag; 1=Update the status In this case this flag has to be equal to 0.</p>																																														
		<p>Component Health: 0=Unhealthy; 1=Healthy In this case this flag has to be equal to 1.</p> <p>Component enable/disable status: 0=Disabled; 1=Enabled In this case this flag is ignored.</p> <p>Health and Status Update: 0=Disabled; 1=Enabled In this case this flag is ignored.</p>																																														
		The following TC is just an example and the value of parameters must be set according to the situation.																																														
		<p>Execute Telecommand</p> <p style="text-align: center;">UpdateHealthTable</p> <p>Command Parameter(s) :</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;"></td> <td style="width: 15%;">N</td> <td style="width: 20%;">DH014160</td> <td style="width: 50%;">2 <dec></td> </tr> <tr> <td></td> <td>COMP</td> <td>DH100160</td> <td>TtrRmIcbRtA</td> </tr> <tr> <td></td> <td>M0</td> <td>DH055160</td> <td>Update Status</td> </tr> <tr> <td></td> <td>M1</td> <td>DH056160</td> <td>Update Status</td> </tr> <tr> <td></td> <td>M2</td> <td>DH057160</td> <td>Ignore Flag</td> </tr> <tr> <td></td> <td>F0</td> <td>DH015160</td> <td>Healthy</td> </tr> <tr> <td></td> <td>F1</td> <td>DH016160</td> <td>ENABLED</td> </tr> <tr> <td></td> <td>F2</td> <td>DH017160</td> <td>ENABLED</td> </tr> <tr> <td></td> <td>COMP</td> <td>DH100160</td> <td>TtrRmIntrptA</td> </tr> <tr> <td></td> <td>M0</td> <td>DH055160</td> <td>Update Status</td> </tr> <tr> <td></td> <td>M1</td> <td>DH056160</td> <td>Update Status</td> </tr> </table>		N	DH014160	2 <dec>		COMP	DH100160	TtrRmIcbRtA		M0	DH055160	Update Status		M1	DH056160	Update Status		M2	DH057160	Ignore Flag		F0	DH015160	Healthy		F1	DH016160	ENABLED		F2	DH017160	ENABLED		COMP	DH100160	TtrRmIntrptA		M0	DH055160	Update Status		M1	DH056160	Update Status	DC822160	
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		<p style="text-align: right;">M2 DH057160</p> <p style="text-align: right;">F0 DH015160</p> <p style="text-align: right;">F1 DH016160</p> <p style="text-align: right;">F2 DH017160</p> <p>TC Control Flags :</p> <p style="text-align: right;">GBM IL DSE</p> <p style="text-align: right;">--Y -- ---</p> <p>Subsch. ID : 10</p> <p>Det. descr. : Update Health Table</p>	<p>Ignore Flag</p> <p>Healthy</p> <p>ENABLED</p> <p>ENABLED</p>																																													
7		Send TC(8,4,115,20) to set the bit rate on TM encoder A		Next Step: 8																																												

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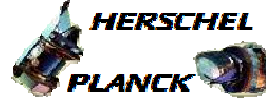
Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		WARNING: before swapping to encoder A, its TM bit rate has to be set to the same TM bit rate being used by TM encoder B		
		The following TC is just an example and the value of parameters must be set according to the situation.		
		Execute Telecommand <p style="text-align: right;">TtcConfigTmEnc_Templ</p> <p>Command Parameter(s) :</p> <p style="text-align: right;">Tm_Enc_Conf_Id DH034170</p> <p style="text-align: right;">TmEncoderId DH033170</p> <p>TC Control Flags :</p> <p style="text-align: right;">GBM IL DSE</p> <p style="text-align: right;">--Y -- ---</p> <p>Subsch. ID : 10 Det. descr. : TEMPLATE TTC: Config TM Enc, TC(8,4,115,20)</p>	DCT21170 TmMod150KbpsM TmEncoderA (Def)	
8		Send TC "Use TM encoder/OBT A"		Next Step: 9
		Execute Telecommand <p style="text-align: right;">Use_TM_Encoder_A</p> <p>TC Control Flags :</p> <p style="text-align: right;">GBM IL DSE</p> <p style="text-align: right;">--Y -- ---</p> <p>Subsch. ID : 10 Det. descr. : Use TM Encoder A - High Priority Standard</p>	DCA48170	
9		Send TC to mark the TM encoder A as "Not failed" in the UIU table		Next Step: 10
		Mark Unit OK telecommand is used for modifying the health status of a unit as OK.		
		Execute Telecommand <p style="text-align: right;">MarkOKUnitA_TtrTmEnObt</p> <p>TC Control Flags :</p> <p style="text-align: right;">GBM IL DSE</p> <p style="text-align: right;">--Y -- ---</p> <p>Subsch. ID : 10 Det. descr. : Fdir Mark OK Unit A TTR Tm Encoder Obt, TC(8,4,116,22)</p>	DCB4H170	
10		was D/L disabled?		Next Step: Yes 11 No 14

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
<p>TC Seq. Name :HRD3056C (Re-enable D/L)</p> <p>TimeTag Type: N Sub Schedule ID: <input type="checkbox"/></p>				
11		Restore nominal transmit storage settings		Next Step: 12
		Execute Procedure: H_FCP_DHS_1003 Nominal TRANSMIT/STORAGE settings		
12		Send TC(14,6) to acquire the list of TM packets downlinked in real time		Next Step: 13
		When CDMU receives this request, the real time down-linking and SSMM storage status are determined for all telemetry packet {Application ID, Type, Sub-Type} and a report (14,7) is generated.		
		Execute Telecommand <p style="text-align: right;">RepDownlinkTMStorage</p> TC Control Flags : <p style="text-align: right;">GBM IL DSE ---Y -- ---</p> Subsch. ID : 10 Det. descr. : Report Telemetry Packets Down-linking/ Storage Status	DC141160	
13		Verify that TM(14,7) has been received		Next Step: 14
		Verify Packet Reception Telemetry Packets DownLinking-Storage Status Report (14,7)-1400 Packet Details: <p style="text-align: right;">APID: 16 Type: 14 Subtype: 7 PI1: PI2:</p>		
		Verify Telemetry <p style="text-align: right;">N DE042160</p>		(None)
		The following parameters are repeated N times		
		Verify Telemetry <p style="text-align: right;">APID DE047160</p>		(None)
		Verify Telemetry <p style="text-align: right;">Type DE043160</p>		(None)
		Verify Telemetry <p style="text-align: right;">Sub-Type DE046160</p>		(None)

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Verify Telemetry Transmit_Flag DE048160		(None)
		Verify Telemetry Storage_Flag DE049160		(None)
<i>TC Seq. Name :HRD3056D (Checks after switch)</i> <i>TimeTag Type: N</i> <i>Sub Schedule ID:</i> <input type="checkbox"/>				
14		Verify that the TM encoder in use is the A		Next Step: 15
		Verify Telemetry Active_TTRBoard DEDMG160	= A	AND=ZAZAA999
15		Verify TM bit rate		Next Step: 16
		Verify Telemetry TME_BITRATE DEMRF160		AND=ZAZAB999
16		Verify that the TM encoder A is marked as "Not failed" in the UIU table		Next Step: 17
		Verify Telemetry Ttr1FailSts DEL09170	= Not_Failed	AND=ZAZAN999
17		Verify that the component has been marked as "Healthy" in the Health Table		Next Step: 18
		Verify Telemetry PmSpwTtrAA_Hlth DEJR3160	= Healthy	AND=ZAZAC999
		Verify Telemetry PmSpwTtrBA_Hlth DEJRZ160	= Healthy	AND=ZAZAC999
		Verify Telemetry TtrRmIcbA_Healt DEJLZ160	= Healthy	AND=ZAZAC999
		Verify Telemetry TtrRmIntA_Healt DEJKZ160	= Healthy	AND=ZAZAB999
		Verify Telemetry TtrRmSgmA_Enabl DEJL2160	= ENABLED	AND=ZAZAC999
18		Send TC(19,4) to re-enable relevant EAT entries		Next Step: 19

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		<p>When this request is received, the action-telecommand associated with the events TM (5,x,56/57/64/65/86/87) shall be enabled.</p> <p>In the TC(19,5) it is necessary to set the following parameters:</p> <p>N, number of events to be enabled; in this case equal to 6.</p> <p>APID, repeated N times, identifier of the Application Process generating this event report; in this case equal to 16 (CDMU).</p> <p>Event ID, repeated N times, identifier of the event to be enabled; in this case equal to 56, 57, 64, 65, 86, 87.</p>																																			
		<p>Execute Telecommand</p> <p style="text-align: right;">EnableActions</p> <p>Command Parameter(s) :</p> <table border="0"> <tr> <td>N Repetition</td> <td>DH041170</td> <td>6 <dec></td> </tr> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>38 <hex></td> </tr> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>39 <hex></td> </tr> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>40 <hex></td> </tr> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>41 <hex></td> </tr> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>56 <hex></td> </tr> </table>	N Repetition	DH041170	6 <dec>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	38 <hex>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	39 <hex>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	40 <hex>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	41 <hex>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	56 <hex>	DCT84170	
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		<table border="0"> <tr> <td>APID_for_EAT_TC</td> <td>DH236170</td> <td>CDMS (Def)</td> </tr> <tr> <td>EventId</td> <td>DH146170</td> <td>57 <hex></td> </tr> </table> <p>TC Control Flags :</p> <table border="0"> <tr> <td>GBM IL DSE</td> <td></td> </tr> <tr> <td>--Y -- --</td> <td></td> </tr> </table> <p>Subsch. ID : 10 Det. descr. : TEMPLATE Enable Actions TC(19,4)</p>	APID_for_EAT_TC	DH236170	CDMS (Def)	EventId	DH146170	57 <hex>	GBM IL DSE		--Y -- --																										
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--Y -- --																																					
19		Call procedure to dump the EAT to verify that the entries have been re-enabled		Next Step: 20																																	
		Execute Procedure: H_FCP_DHS_3051 Report event-action management status or event detection list																																			
20		Call procedure to set the central time reference		Next Step: 21																																	

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Step No.	Time	Activity/Remarks	TC/TLM	Display/ Branch
		Execute Procedure: H_FCP_DHS_3021 Set central time reference synchronization Parameters: CURRTIME CurrTime a CTR value in the future NEWTIME NewTime as required, see TAI spreadsheet		
		Verify if CTR has restarted from zero or not (very low CTR value in the last time packet). The time stamp of the packets is driven by PM_OBT. PM_OBT may have restarted from zero and be unsynchronized (bad time in TMPH) while CTR may still be good.		
21		Call procedure to synchronize the ACC remote terminal. Instrument RT should auto-synchronize.		Next Step: END
		Execute Procedure: H_FCP_DHS_3019 Remote terminal synchronization with bus controller		
End of Procedure				