Test Procedures Change List (TPCL) for IEC 61850 server test procedures revision 2.2

UCA International Users Group
Testing Sub Committee

Date: November 27, 2008

Introduction

Problems that are uncovered during conformance testing that impact the IEC 61850 Standard are taken back through the TISSUES Process. However, there are some problems that relate only to the content of the Test Procedures. The UCAiug is the owner of the Test Procedures and so has the responsibility for tracking changes. Given the long time lag between major versions, we have a need to track interim changes that may impact testing. This “Test Procedures Change List (TPCL)" document specifies such interim changes. The UCAiug test sub committee reviews and approves each change. Changes resulting in new test procedures shall be specified in the next revision of the test procedures.

This list:

- Contains changes to the most recent (server) test procedures
- Indicate if a change is:
  - Accepted, resulting in a clarified test procedure (included after the change list table)
  - Denied
  - Added to the next revision
- Shall be used by recognized/accredited test labs
- Should be referenced in the test report only
- Is available at the UCAiug sharepoint for test sub committee members

References

Conformance Test Procedures for Server Devices with IEC 61850-8-1 interface,
Revision 2.2, October 8, 2007

Approved Change List

ID	TEST CASE	CHANGE	FINAL PROPOSAL	RESULT
1	SubN1	The testscript specifies changing value while subEna=T should fail. This is not specified in part 7-2 and this should be allowed	Update the test procedure	Agree, to clarify the test procedure
2	RpN6, BrN6	Response- error not specified	Expected Response- error should be “object-value-invalid”	Agree, to clarify the test procedure
3	Gop6	Only GoEna is writable (part 8-1 table 50)	Remove the test steps with SetGoCBValues of other attributes	Agree, to clarify the test procedure
4	SBOes2	Expected result still uses “CommandTermination” this should be “operate response-“	Change the text. Shall we define AddCause = “parameter-change in execution” as well in case the operate ctlVal is different from the select ctlVal?	Agree, to clarify the test procedure

ID	TEST CASE	CHANGE	FINAL PROPOSAL	RESULT
5	AssN4	Detection of lost link Test Case (escpecially point 6.) ? *The Test case description says the* ***GetDataValues Response-*** *is expected as response of "GetDataValues Request" after lost link. But there is no chance to get any response - the association is already aborted.*	DUT sends no response" instead of "DUT sends GetDataValues Response- "	Agree, to clarify the test procedure
6	CtlN10	Next step after step c) is e).	Use d)	Agree
7	Sg4 SgN1b SgN2 SgN3 SgN4	Replace ConfirmEditSGValues by ConfirmEditSG. Abstract testcases do not match with the detailed test procedures. Abstract test case SgN3 and SgN4 are the same	Change SgN3 to edit Sg=0	Agree, to clarify the test procedure
8	RpN4, BrN4	RpN4 mentions the exact error codes, BrN4 not	Add error codes to BrN4	Agree, to clarify the test procedure
9	Sub3	A local function may undo the substitute values. Part7-2 page 64: *There may be cases, where a local automatic function disables substitution, for example, if blocking of information exchange is disabled or communication is* *no longer interrupted*.	Update test procedure. Add PIXIT entry to describe such function	Agree, to clarify the test procedure
10	DsetN15	The condition RCB–RptEna=false is not tested	Add this check to the test: 1. Client requests a persistent CreateDataSet. 2. Client configures and enables a (buffered or unbuffered) RCB with this data set 3. Client requests a DeleteDataSet on the data set created in step 1 **4. Client disables the RCB, repeat step 3** The expected result for step 4 is the same as for step 3	Agree, to clarify the test procedure
11	Ft1, FtN1	Clarify the test cases expected result in case the GetServerDirectory(FILE) has no or empty parameters. As specified part 8-1 on page 39 "If the Filename (for instance MMS FileSpecification) is not present in the FileDirectory.request, then the responding server shall return the Filenames present in the root directory	Add or clarify the expected result when the request has no or empty filespecification parameter	Agree, to clarify the test procedure
12	CtlN4	SBOns has no SelectWithValue	Replace SelectWithValue by Select	Agree, to clarify the test procedure
13	Gop3	"First GOOSE sqNum at boot should be 1" according to Tissue 52. But 7-2 ed.2 CDV specifies: *The initial value for* ***SqNum*** *upon a transition of GoEna to TRUE is recommended to be 0.*	Update test procedure and allow any boot value of sqNum. Add entry in the PIXIT to specify the sqNum boot value	Agree, to clarify the test procedure

ID	TEST CASE	CHANGE	FINAL PROPOSAL	RESULT
14	CtlN3	Vendors should be able to allow open command of the breaker, even if the position indicates open position. Motivation: Personal safety: e.g. in some cases the position indication sensor could be jammed and opening is needed. Technically XCBR.BlkOpn/BlkCls (or CILO.EnaOpn/EnaCls) should be used if the opening is not possible due to internal condition of the breaker (spring charging, disconnector state). Closing breaker could still be inhibited if the position indication indicates close. Part 7-2 17.2.2 does not directly inhibit above functionality but in conformance testing this functionality is not allowed	Adjust the expected result to allow pos/neg respond as specified in PIXIT. Add entry in the PIXIT.	Agree, to clarify the test procedure
15	CtlN2	Tissue 334 final proposal is to response- on second select; The testprocedures allows a positive respond	Update the testprocedure, the expected result is always negative	Agree, to clarify the test procedure
16	SBOns, DOns	The "red" IntOp Tissue 246 and 61850-8-1 ed2 CD table 57 are in conflict on Operate response- with or without an informationReport with LastApplError	Allow an optional InformationReport with LastApplError. Add entry in the PIXIT	Agree, to clarify the test procedure PIXIT shall describe the behavior. No need to update the test procedures. . Add entry in the PIXIT
17	CtlN1	For SBOes a Operate response- is not a commandtermination but an information report	Replace command termination by InformationReport	Agree, to clarify the test procedure
18	Ctl3 and other	The expected result does not specify the AddCause and Error values	Specifiy other testcases as well. For Ctl3 the AddCause = "1-of-n control" with Error = Operate Test Not Ok	Agree, to clarify the test procedure Ctl3
19	Ctl3	Some devices allow only one control action simulaneously (1-of-n control). But other devices allow it as such these device send positieve respond!	Add reference to PIXIT if 1-of-n multi control is allowed or not	Agree, to clarify the test procedure
20	SBOns1, CtlN4b, CtlN2b	The expected result is incorrect; A select response- is mapped on read response+ with null value Note: by executing CtlN4 you also have performed SBOns1 as such the testcase could refer to CtlN4	Expected result = DUT sends Select response- We recommend that all test cases use the part 7-2 terminology	Agree, to clarify the test procedure. .
21	Cnf6	Configuration version is in SCD or CID not in ICD	Change ICD into SCD or CID	Agree, to clarify the test procedure
22	TICS template	Some "mandatory" tissues have changed	Update TICS template and annex C	Agree, compare TICS template 0.2
23	SgN5	It's allowed to edit the values of the active setting group.	Adjust expected result	Agree, to clarify the test procedure
24	Srv6	DC may be written, EX is read-only	Adjust test procedures	Agree, to clarify the test procedure

List of denied and next revision changes

ID	TEST CASE	CHANGE	FINAL PROPOSAL	RESULT
1	Rp6	Note in 7-2, $14.2.2.7 specifies that ConfRev may not change by using services on data sets.	Fix	Denied, the note should be removed
2	Br purge	Writing the same value to trgops, optflds etc should not purge the buffer (see part 8-1 just under table 37)	Add new test procedure for this	Next revision
3	Sg	The SG last activation time is not tested at all.	Add new testcase to verify: 13.2.2.7 LActTm – last activation time The attribute LActTm shall identify the time when the last service SelectActiveSG has been processed.	Next revision
4	Gos2	Add the following situation: changing the test flag **without** changing the data and statenum. Same for NdsCom; Expected result should be described in the PIXIT: e.g. keep old state, set quality flag	Extend test case	Next revision
5	Cnf5	ctlModel should be initialized in SCD and CID, but for for ICD its conditional	Include the SCD/CID file as part of the test	Denied, the scope of the test is the ICD and the optional CID. When ctlModel is fixed the ICD should have initialized ctlModel values. Testcase is conditional
6	New	Add a testcase to verify the minimum supported IEDname+LD length is 32 chars		Next revision

Clarified Test Procedures (in alphabetical order)

The changes are marked in blue.

AssN4	Detection of lost link	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 7.4, IEC 61850-8-1 clause 10.2 PIXIT		
Expected result 2. DUT sends Associate Response+ 3. DUT sends GetDataValues Response+ 6. DUT sends no response		
Test description 1. Configure the SIMULATOR and DUT with the correct association and authentication parameters 2. Client requests Associate 3. Client requests a correct GetDataValues 4. Disconnect the physical link, between the switch and the client, some seconds longer than the KEEP ALIVE timeout specified in the PIXIT 5. Connect the physical link 6. Verify the DUT has lost the association by sending a correct GetDataValues request		
Comment		

BrN4	Incorrect configuration of BRCB	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 14.2.3.2.2.9 IEC 61850-8-1 clause 17.1.1.1		
Expected result 2. DUT sends SetBRCBValues() Response with data access error “temporarily-unavailable” 4. DUT sends SetBRCBValues() Response with data access error “object-access-denied” 5. DUT sends SetBRCBValues() Response with data access error “object-value-invalid”		
Test description 1. Client configures and enable an available BRCB 2. Client requests SetBRCBValues() with one of the following attributes RptID, DatSet, OptFlds, BufTm, TrgOps, IntgPd, PurgeBuf, EntryID 3. Disable the BRCB 4. Client requests SetBRCBValues() with one of the following attributes ConfRev, SqNum, TimeOfEntry 5. Client requests SetBRCBValues() with unknown DatSet		
Comment Step 5 is only applicable when the DUT supports report control datset="dyn"		

BrN6	Configure unsupported BRCB options	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 14.2.1 IEC 61850-8-1 clause 17.1.1.1		
Expected result 1 to 3: DUT sends SetBRCBValues() Response- with data access error “object-value-invalid"		
Test description 1. Client requests SetBRCBValues() with one of the unsupported optional fields 2. Client requests SetBRCBValues() with one of the unsupported trigger conditions 3. Client requests SetBRCBValues() with one of the unsupported BRCB parameters		
Comment PIXIT specifies that the following optional fields are not supported: <to be completed> PIXIT specifies that the following trigger conditions are not supported: <to be completed> PIXIT specifies that the following RCB parameters are not supported: <to be completed>		

Cnf6	Check if the SCD or CID: IED configVersion and the NamPlt.configRev values do match	☐ Passed ☐ Failed ☐ Inconclusive

Note: For direct and SBO with normal security the PIXIT specifies if the DUT will send an additional MMS InformationReport with LastApplError after a select/operate respond-. In that case the AddCause value should be the same as for enhanced security control

Ctl3	Select/cancel all SBO control objects	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.2 IEC 61850-8-1 clause 20, Annex E PIXIT		
Expected result DUT sends Response+ for non-interlocked objects and Response- with AddCause "1-of-n control " for interlocked objects (PIXIT)		
Test description 1. Client request SelectWithValue for some SBOes control objects 2. Client requests Select for some SBOns control objects 3. Client request Cancel for the selected control object in reverse order		
Comment		

CtlN1	Direct operate a SBO control object	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.3.3 IEC 61850-8-1 clause 20.6, 20.7 and 20.8		
Expected result b) DUT responds with Operate Response- and the control object returns to the "unselected" state d) DUT responds with Operate Response- with AddCause "object-not-selected" and the control object returns to the "unselected" state		
Test description b) Client sends correct Operate once request of an unselected SBOns object d) Client sends correct Operate once request of an unselected SBOes object		
Comment		

CtlN2	Select a SBO control object twice	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.3.3 IEC 61850-8-1 clause 20.6, 20.7 and 20.8 PIXIT		
Expected result b) SBOns: 1. DUT responds with Select Response+ 2. DUT responds with Select Reponse- 3. DUT responds with Operate reponse+ d) SBOes: 1. DUT responds with SelectWithValue Response+ 2. DUT responds with SelectWithValue Response- 3. DUT responds with Operate reponse+ and CommandTermination+		
Test description b) SBOns: 1. Client sends correct Select request of an unselected SBOns object 2. Same client sends correct Select request of the same SBOns object just before the sboTimeout 3. Client sends correct Operate request just before the sboTimeout of step 8 d) SBOes: 1. Client sends correct SelectWithValue request of an unselected SBOes object 2. Same client sends correct SelectWithValue request of the same SBOes object just before the sboTimeout 3. Client sends correct Operate request just before the sboTimeout of step 2		
Comment		

CtlN3	SelectWithValue or Operate value is same as actual value	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.3.3 IEC 61850-8-1 clause 20.6, 20.7 and 20.8 PIXIT		
Expected result a) DUT responds as specified in PIXIT b) DUT responds as specified in PIXIT c) DUT responds as specified in PIXIT d) DUT responds as specified in PIXIT		
Test description a) DOns: Client sends Operate request with actual value of a DOns object b) SBOns: Client sends Select and Operate request with actual value of a SBOns object c) DOes: Client sends Operate request with actual value of a DOes object d) SBOes: Client sends SelectWithValue request with actual value of a SBOes object, on response+ request Operate with actual value		
Comment PIXIT should specify one or more of the following responses: 1. Response+ 2. Response-, “temporarily unavailable” 3. Response-, “object-access-denied” And for SBOes the PIXIT should specify if the value check is performed during the SelectWithValue or Operate phase.		

CtlN4	Select an SBO control object twice from 2 clients	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.3.3 IEC 61850-8-1 clause 20.6, 20.7 and 20.8		
Expected result b) SBOns: 1. DUT responds with Select Response+ 2. DUT responds with Select Response- 3. DUT responds with Operate Reponse+ d) SBOes: 1. DUT responds with SelectWithValue Response+ 2. DUT responds with SelectWithValue Response- with Error “Operator Test Not OK” and AddCause “Command-already-in-execution” 3. DUT responds with Operate Reponse+ and CommandTermination+		

Test description

b) SBOns:

1. Client1 sends correct Select request of an unselected SBOns object
2. Client2 sends correct Select request of the same SBOns object before the sboTimeout
3. Client1 sends correct Operate request

d) SBOes:

1. Client1 sends correct SelectWithValue request of an unselected SBOes object
2. Client2 sends correct SelectWithValue request of the same SBOes object before the sboTimeout
3. Client1 sends correct Operate request

Comment

DsetN15	Delete referenced data set	☐ Passed ☐ Failed ☐ Inconclusive

IEC 61850-7-2 clause 11.1, 11.3.4, 11.3.5, 14.2
IEC 61850-8-1 clause 14.3.3, 14.3.4, 17.2, PICS

Expected result

1. DUT sends a CreateDataSet Response+
3. DUT sends a DeleteDataSet Response with Number deleted = 0
4. DUT sends a DeleteDataSet Response with Number deleted = 0

Test description

1. Client requests a persistent CreateDataSet.
2. Client configures and enables a (buffered or unbuffered) RCB with this data set
3. Client requests a DeleteDataSet on the data set created in step 1
4. Client disables the RCB and requests a DeleteDataSet on the data set created in step 1

Comment

Ft1	GetServerDirectory(FILE)	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 6.2.2 IEC 61850-8-1 clause 23, Tissue #118, PIXIT		
Expected result 1. DUT sends GetServerDirectory(FILE) Response+ with a list of files and/or directories according to the PIXIT. If the Filename (for instance MMS FileSpecification) is not present in the FileDirectory.request, then the responding server shall return the filenames present in the root directory		
Test description 1. Client requests GetServerDirectory(FILE) and for each responded directory Client requests GetServerDirectory(FILE)		
Comment		

FtN1	GetFile, GetFileAttributeValues, DeleteFile with unknown file name	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 20.2.1, 20.2.4, 20.2.3 IEC 61850-8-1 clause 23.2 PIXIT		
Expected result a) DUT sends GetFile Response- b) DUT shall return the filenames present in the root directory c) DUT sends DeleteFile response-		
Test description a) Client requests GetFile with unknown file b) Client requests GetFileAttributeValues with unknown file c) Client requests DeleteFile with unknown file		
Comment		

Gop3	Initial GOOSE message	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 15.3.2.2 IEC 61850-8-1 clause PIXIT		
Expected result 1. DUT sends initial GOOSE message with stNum one (1) and sqNum as specified in the PIXIT		
Test description 1. Restart the DUT, enable GoCB when necessary, and wait for initial GOOSE		
Comment		

Gop6	SetGoCBValues	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 15.2.1.3, 15.2.2.5, 15.2.2.6 IEC 61850-8-1 clause		
Expected result 1. DUT sends a SetGoCBValues response+ and stops transmitting GOOSE messages 2. DUT sends a SetGoCBValues response+ and initializes/starts transmitting GOOSE messages. The first message has stNum=1 ~~and sqNum=1~~)		
Test description 1. Client requests a SetGoCBValues with GoEna set to FALSE 2. Client requests a SetGoCBValues with GoEna set to TRUE		
Comment GoEna is the only attribute that may be written		

RpN6	Configure unsupported URCB options	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 14.2.1 IEC 61850-8-1 clause 17.1.1.2		
Expected result 1 to 3: DUT sends SetURCBValues() Response- with error “object-value-invalid"		
Test description 1. Client requests SetURCBValues() with one of the unsupported optional fields 2. Client requests SetURCBValues() with one of the unsupported trigger conditions 3. Client requests SetURCBValues() with one of the URCB parameters		
Comment PIXIT specifies that the following optional fields are not supported: <to be completed> PIXIT specifies that the following trigger conditions are not supported: <to be completed> PIXIT specifies that the following RCB parameters are not supported: <to be completed>		

SBOes2	SelectWithValue followed by cancel, timeout or operate resulting in test not ok	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.3.3 IEC 61850-8-1 clause 20.6, 20.7 and 20.8		
Expected result 1. DUT responds with Cancel Response+ 2. DUT sends nothing 3. DUT sends TimeOperate response+ followed by timer_expired.TimeOperate response+ followed by TimeOperate response- with error “Timeout Test Not OK” 4. DUT sends Operate response- with error “Operator Test Not OK” In all cases the control object returns to the “unselected” state		
Test description Client sends correct SelectWithValue request followed by: 1. Client sends correct Cancel request 2. Or Client waits for timeout 3. Or force EQUIPMENT SIMULATOR that the Client Time Activated operate request results in “test not ok” 4. Or force EQUIPMENT SIMULATOR that the Client Operate request results in “test not ok”		
Comment		

SBOns1	Incorrect Select	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 17.2.2 IEC 61850-8-1 clause 20.4 and 20.7		
Expected result DUT sends a Select Response- (MMS read response+ with SBO null value)		
Test description 1. Client sends Select request with unknown control object		
Comment		

Sg4	SelectEditSG after lost association	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 13.3.3.1 IEC 61850-8-1 clause 16.2.2 PIXIT		
Expected result 1. DUT sends SelectEditSG Response+ 2. DUT sends SetSGValues [FC=SE] Response+ 3. DUT aborts the association 4. DUT send associate response+ 5. DUT sends SelectEditSGValues Response+ 6. DUT sends SetSGValues [FC=SE] Response+ 7. DUT sends ConfirmEditSGValues Response+		
Test description 1. Client requests SelectEditSG of the first setting group 2. Client requests SetSGValues [FC=SE] to change values 3. Clients aborts the association 4. Client requests associate 5. Client requests SelectEditSGValues of the first setting group 6. Client requests SetSGValues [FC=SE] to change values 7. Client requests ConfirmEditSGValues		
Comment		

SgN1b	Request following setting group definition services with wrong parameters (out of range values, or non existent/null setting group) and verify response- service error – SelectEditSG (IEC 61850-7-2 clause 13.3.3) – SetSGValues (IEC 61850-7-2 clause 13.3.4) – ConfirmEditSgValues (IEC 61850-7-2 clause 13.3.5) – GetSGValues [FC=SE] (IEC 61850-7-2 clause 13.3.6)
SgN2	Request SetSGValues (FC=SG), verify response- service error
SgN3	Request SetSGValues (FC=SE) when EditSG = 0, verify response- service error
SgN4	Request SelectEditSG of the first setting group, change one value and SelectEditSG of the second setting group without (ConfirmEditSgValues). Verify the changes will be lost
SgN5	Verify that the values of the active setting group can be edited and confirmed

SgN2	SetSGValues [FC=SG]	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 13.2, 13.2 IEC 61850-8-1 clause 16.2.3		
Expected result 1. DUT sends SetSGValues Response-		
Test description 1. Client requests a valid SetSGValues [FC=SG]		
Comment		

SgN3	SetSGValues when EditSG=0	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 13.2, 13.3 IEC 61850-8-1 clause 16.2.3		
Expected result 2. DUT sends SetSGValues Response-		
Test description 1. Client requests SelectEditSG with edit setting group 0 2. Client requests a valid SetSGValues [FC=SE]		
Comment		

SgN4	SelectEditSG without confirmation	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 13.3, 13.3 IEC 61850-8-1 clause 16.2.1		
Expected result 1. DUT sends SelectEditSG Response+ 2. DUT sends GetSGValues [FC=SE] Response+ 3. DUT sends SetSGValues [FC=SE] Response+ 4. DUT sends GetSGValues [FC=SE] Response+ 5. DUT sends SelectEditSG Response+ 6. DUT sends GetSGValues [FC=SE] Response+, note that changes are lost		
Test description 1. Client requests SelectEditSG of the first setting group 2. Client requests GetSGValues [FC=SE] to read the original values 3. Client requests SetSGValues [FC=SE] to change all values in the group 4. Client requests GetSGValues [FC=SE] to verify the new values 5. Client requests SelectEditSG of the first setting group again 6. Client requests GetSGValues [FC=SE] to verify the original values		
Comment		

SgN5	Edit the active setting group	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 13.2, 13.3 IEC 61850-8-1 clause 16.2.1, 16.2.5		
Expected result 1. DUT sends SelectActiveSG Response+ 2. DUT sends SelectEditSG Response+ 3. DUT sends SetSGValues Response+ 4. DUT sends ConfirmEditSG Response+		
Test description 1. Client requests SelectActiveSG of the first setting group 2. Client requests SelectEditSG of the first setting group 3. Client requests SetSGValues [FC=SE] 4. Client requests ConfirmEditSG		
Comment		

Srv6	SetDataValues	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 10.4.3 IEC 61850-8-1 clause 13.2.2 PIXIT		
Expected result 1. DUT sends SetDataValues Response- 2. DUT sends SetDataValues Response- for read-only data and Response+ for write enabled data (as specified in the standard, ICD or PIXIT) 3. and 5. DUT sends SetDataValues Response+ 4. and 6. the value does match		
Test description For each data object with functional constraint ST, MX, EX 1. Client sends a SetDataValue with the current value For each data object with functional constraint CF, SP, EX, DC 2. Client sends a SetDataValue with the current value For the first write-enabled data object (if any) 3. Client sends a SetDataValue with a valid new value 4. Client sends a GetDataValue request and check the value does match 5. Client sends a SetDataValue with the original value 6. Client sends a GetDataValue request and check the value does match		
Comment		

Sub3	Transmission of substituted values after reboot	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 12 IEC 61850-8-1 clause 15 PIXIT		
Expected result 1. DUT sends GetDataValues response+ with process values 2. DUT sends SetDataValues Response+ 3. DUT sends SetDataValues Response+ 4. DUT reboots 5. DUT sends Associate response+ 6. DUT sends GetDataValues Response+ with substituted values 7. DUT sends SetDataValues Response+		
Test description 1. Client requests GetDataValues of ST/MX data value 2. Client requests SetDataValues of the SV data value attributes 3. Client requests SetDataValues to enable substitution 4. Test engineer reboots DUT 5. Client requests Associate 6. Client requests GetDataValues of ST/MX data value 7. Client requests SetDataValues to disable substitution		
Comment In 7-2 the behaviour after reboot is not specified. PIXIT may describe cases where a local automatic function disables substitution		

SubN1	Substitute values when substitution is already enabled	☐ Passed ☐ Failed ☐ Inconclusive
IEC 61850-7-2 clause 12 IEC 61850-8-1 clause 15		
Expected result 1. DUT sends GetDataValues response+ with process values 2. DUT sends SetDataValues Response+ 3. DUT sends SetDataValues Response+ 4. DUT sends SetDataValues Response+ 5. DUT sends GetDataValues response+ with substituted values 6. DUT sends SetDataValues Response+ 7. DUT sends GetDataValues response+ with process values		

Test description

1. Client requests GetDataValues of a ST and/or MX data object
2. Client requests SetDataValues of the SV data value attributes
3. Client requests SetDataValues to enable substitution
4. Client requests SetDataValues of the SV data value attributes
5. Client requests GetDataValues of the ST and/or MX data object
6. Client requests SetDataValues to disable substitution
7. Client requests GetDataValues of the ST and/or MX data object

Comment

Dset6	Deletion of non-persistent dataset after Release	☐ Passed ☐ Failed ☐ Inconclusive

IEC 61850-7-2 clause 9.2.2, 11.1, 11.3.2, 11.3.4, 11.3.5
IEC 61850-8-1 clause 12.3.1, 14.3.1, 14.3.3, 14.3.4

Expected result

1. DUT sends a Response+
2. DUT sends a Response+
3. The data set is not available, it is deleted. DUT sends MMS service error with error class access object-non-existent (table 23)
4. See result 1, 2 and 3

Test description

1. Client requests a non-persistent CreateDataSet with at least one member
2. Client requests Release and then Associate
3. Client requests a GetDataSetValues for the just created data set
4. Repeat step 1, 2 and 3 but in 2 use Abort instead of Release

Comment

DsetN2	Create a persistent dataset twice	☐ Passed ☐ Failed ☐ Inconclusive

IEC 61850-7-2 clause 11.1, 11.3.4
IEC 61850-8-1 clause 14.3.3

Expected result

1. DUT sends a Response+,
2. DUT sends MMS service error with error class definition object-exists (table 31)

Test description

1. Client requests a CreateDataSet for a persistent data set with at least one member
2. Client requests the same CreateDataSet again

Comment