

SITE COMPLETION CHECKLIST PLANT INTERFACING WORK(PIW) (SHUTDOWN)			 TENAGA NASIONAL		
Doc No.	SCC PIW(SD)	Rev. No.	1	Date	5 JUNE 2020

CONTRACT TITLE :

**PEMBEKALAN, PEMASANGAN, PENGUJIAN DAN MULATUGAS FASILITI SCADA (RTU) UNTUK PROJEK SBU ASSET
DEVELOPMENT DISTRIBUTION NETWORK DIVISION. TNB**

CONTRACT NO. :	TNB131/2024	
CONTRACTOR :	ARAS KEJURUTERAAN	
DATE :	29-11-2025	
SUBSTATION NAME :	SSU ELMINA ILHAM NO. 1	
FUNCTIONAL LOCATION :	BSAM/PCE/J02351	
SUBZONE :	BSAM	
STATE :	SELANGOR	
WORK TYPE : (Tick "✓" whichever applicable)		Plant Interfacing Work (PIW) VCB
		Plant Interfacing Work (PIW) M-RMU
	✓	INTEGRATED AD VCB
		INTEGRATED AD M-RMU

SITE COMPLETION CHECKLIST PLANT INTERFACING WORK(PIW) (SHUTDOWN)			 TENAGA NASIONAL		
Doc No.	SCC PIW(SD)	Rev. No.	1	Date	5 JUNE 2020
A1. SITE COMPLETION CHECKLIST FOR PLANT INTERFACING WORK (SHUTDOWN)					
CONTRACT NO. :		TNB131/2024			
FUNCTIONAL LOCATION :		BSAM/PCE/J02351			
SUBSTATION NAME :		SSU ELMINA ILHAM NO. 1			
Check boxes as follows: (✓) OK NI : Need Improvement (Pls. give comments at 'Remark' column)					
No.	Description	OK	NI	REMARKS	
1. Visual Checks on RCB					
i.	Printed stencils (black text on white, with laminated tape) are completed and put for station name / numberings at: • Remote Control Box (RCB)'s Door Panel • Link numbers for feeders in the RCB	✓			
ii.	SCADA-ready Stickers are stucked next to Local/Remote Switches	✓			
iii.	All feeders' labellings tally with switchgears at site.	✓			
iv.	All Local/Remote switches are at Remote position at switchgears	✓			
v.	All non-armoured cables (including EFI CT cable) shall be installed in rigid high impact PVC conduits, neatly secured in position and adequately supported where necessary in an approved manner.	✓			
vi.	All wirings to the terminal blocks are wired according to Cable Schedule, terminated tightly and terminal blocks are in good condition.	✓			
vii.	All cables shall be properly glanded at the cable entry points using proper glanding and sealing (to ensure no space/gap between the cable entry points/glands and the panel)	✓			
2. Visual Checks on Installations					
a. Battery Charger (including Batteries)					
i.	All wirings to the terminal blocks are terminated tightly and terminal blocks are in good condition.	✓			
ii.	Relevant Stickers for Battery Charger are available.	✓			
iii.	All tests for Battery Charger are conducted & Test results recorded in Test Forms accordingly.	✓			
b. Earth Fault Indicators (EFIs)					
i.	Printed stencils (black text on white, with laminated tape) are available for numbering on the mounting board.	✓			
ii.	EFI CT cables from EFI to Switchgears are laid, terminated & clamped.	✓			
3. Site Drawings & Tests					
i.	Hardcopy of Approved Drawings - Documents are available & placed inside RCB / RTU panel. [Note: Any changes to the drawings shall be updated in softcopy and passed to TNB as As-built drawings].	✓			
ii.	Hardcopy of Mastersheet & Wiring List (Working Copies) - Any changes shall be updated/written in the Mastersheet & Wiring List & verified, signed and stamped by supervisor / representative - Documents are available & placed inside RCB / RTU panel.	✓			
iii.	Check & verify all necessary tests are performed as required & have passed.	✓			
Observations:					
Checks conducted by: Contractor's Signature & Stamp: 			Verified by: TNB's Representative Signature & Stamp: 		
Name: MOHD TARMIZI ALIAS			Name:		
Date: 29-11-2025			Date: 06-01-2026 15:23:42		

SITE COMPLETION CHECKLIST PLANT INTERFACING WORK(PIW) (SHUTDOWN)					 TENAGA NASIONAL		
Doc No.	SCC PIW(SD)	Rev. No.	1	Date	5 JUNE 2020		
A1. SCC PIW (DURING PRE-CABLING & INSTALLATION)							
CONTRACT NO. :		TNB131/2024					
FUNCTIONAL LOCATION :		BSAM/PCE/J02351					
SUBSTATION NAME :		SSU ELMINA ILHAM NO. 1					
Remote Control Box	Brand	MULTIPIN AHM					
	Type	Multipin	✓	Conventional			
	Serial Number	RCB 1 Serial Number	BF250211				
		RCB 2 Serial Number					
		RCB 3 Serial Number					
Battery Charger	Brand	29-11-2025					
	Serial Number	B23373					
Earth Fault Indicator	Serial Number	EFI-1:	1627182	EFI-6:		EFI-11:	
		EFI-2:	0889322001088024	EFI-7:		EFI-12:	
		EFI-3:	1581101	EFI-8:		EFI-13:	
		EFI-4:		EFI-9:		EFI-14:	
		EFI-5:		EFI-10:		EFI-15:	
Switchgear	Brand						
	Configuration:						
Observations:							
Checks conducted by: Contractor's Signature & Stamp:				Verified by: TNB's Representative Signature & Stamp:			
							
Name: MOHD TARMIZI ALIAS				Name:			
Date: 29-11-2025				Date: 06-01-2026 15:23:42			

SITE ACCEPTANCE TEST (SAT) PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN			 TENAGA NASIONAL		
Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020

CONTRACT TITLE :

**PEMBEKALAN, PEMASANGAN, PENGUJIAN DAN MULATUGAS FASILITI SCADA (RTU) UNTUK PROJEK SBU ASSET
DEVELOPMENT DISTRIBUTION NETWORK DIVISION. TNB**

CONTRACT NO. :	TNB131/2024
CONTRACTOR :	ARAS KEJURUTERAAN
DATE :	29-11-2025
SUBSTATION NAME :	SSU ELMINA ILHAM NO. 1
FUNCTIONAL LOCATION :	BSAM/PCE/J02351
SUBZONE :	BSAM
STATE :	SELANGOR

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A4. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

4. Conduct Point-to-point Cable Termination Continuity Tests.
5. Conduct Short to Ground (Leakage) test for each connector pin.
6. Record test results in [1] **Termination Continuity Test Sheet**.

[1] **TERMINATION CONTINUITY TEST SHEET**

Feeder No.: X20285

Feeder Name: VCB 5 PPU WORLDWIDE

19 cores, 1.5 mm sq, armoured (Alarm & Control cables) *Note: Please add/edit according to station's requirement

Cable No.	Core No.	Signal	From	To	Termination Continuity Test	Short to Ground (Leakage) Test	REMARKS
LBS-1	1	Earth	RCB	SG PANEL	✓	Not applicable	
LBS-1	2	Gas Low Alarm	RCB	SG PANEL	✓	✓	
LBS-1	3	Spare	RCB	SG PANEL	✓	✓	
LBS-1	4	LBS Status Open	RCB	SG PANEL	✓	✓	
LBS-1	5	LBS Status Close	RCB	SG PANEL	✓	✓	
LBS-1	6	Earth Switch Status Open	RCB	SG PANEL	✓	✓	
LBS-1	7	Earth Switch Status Close	RCB	SG PANEL	✓	✓	
LBS-1	8	Common Return Pin (4,5,6,7)	RCB	SG PANEL	✓	✓	
LBS-1	9	Local / Remote Indication	RCB	SG PANEL	✓	✓	
LBS-1	10	Trip Circuit Supervision	RCB	SG PANEL	✓	✓	
LBS-1	11	Overcurrent	RCB	SG PANEL	✓	✓	
LBS-1	12	Earth Fault	RCB	SG PANEL	✓	✓	
LBS-1	13	IRF & Comm Fail	RCB	SG PANEL	✓	✓	
LBS-1	14	Current Diff / Spare	RCB	SG PANEL	✓	✓	
LBS-1	15	Common Return Pin (9-14)	RCB	SG PANEL	✓	✓	
LBS-1	16	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-1	17	Command From R/S Close	RCB	SG PANEL	✓	✓	
LBS-1	18	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-1	19	Command From R/S Open	RCB	SG PANEL	✓	✓	

4 cores, 1.0 mm sq, non-armoured (EFI signal cables)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
EFI1		Common	EFI	RCB	✓	
EFI1		EFI Indication	EFI	RCB	✓	
EFI1		CO-Common	EFI	RCB	✓	
EFI1		EFI Reset	EFI	RCB	✓	

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Date: 29-11-2025

Verified by:
TNB's Representative Signature & Stamp:

Name:

Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A4. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

4. Conduct Point-to-point Cable Termination Continuity Tests.
5. Conduct Short to Ground (Leakage) test for each connector pin.
6. Record test results in [1] **Termination Continuity Test Sheet**.

[1]	TERMINATION CONTINUITY TEST SHEET
Feeder No.:	X20286
Feeder Name:	TX1

19 cores, 1.5 mm sq, armoured (Alarm & Control cables) *Note: Please add/edit according to station's requirement

Cable No.	Core No.	Signal	From	To	Termination Continuity Test	Short to Ground (Leakage) Test	REMARKS
LBS-2	1	Earth	RCB	SG PANEL	✓	Not applicable	
LBS-2	2	Gas Low Alarm	RCB	SG PANEL	✓	✓	
LBS-2	3	Spare	RCB	SG PANEL	✓	✓	
LBS-2	4	LBS Status Open	RCB	SG PANEL	✓	✓	
LBS-2	5	LBS Status Close	RCB	SG PANEL	✓	✓	
LBS-2	6	Earth Switch Status Open	RCB	SG PANEL	✓	✓	
LBS-2	7	Earth Switch Status Close	RCB	SG PANEL	✓	✓	
LBS-2	8	Common Return Pin (4,5,6,7)	RCB	SG PANEL	✓	✓	
LBS-2	9	Local / Remote Indication	RCB	SG PANEL	✓	✓	
LBS-2	10	Trip Circuit Supervision	RCB	SG PANEL	✓	✓	
LBS-2	11	Overcurrent	RCB	SG PANEL	✓	✓	
LBS-2	12	Earth Fault	RCB	SG PANEL	✓	✓	
LBS-2	13	IRF & Comm Fail	RCB	SG PANEL	✓	✓	
LBS-2	14	Current Diff / Spare	RCB	SG PANEL	✓	✓	
LBS-2	15	Common Return Pin (9-14)	RCB	SG PANEL	✓	✓	
LBS-2	16	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-2	17	Command From R/S Close	RCB	SG PANEL	✓	✓	
LBS-2	18	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-2	19	Command From R/S Open	RCB	SG PANEL	✓	✓	

4 cores, 1.0 mm sq, non-armoured (EFI signal cables)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
EFI2		Common	EFI	RCB	✓	
EFI2		EFI Indication	EFI	RCB	✓	
EFI2		CO-Common	EFI	RCB	✓	
EFI2		EFI Reset	EFI	RCB	✓	

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by: Contractor's Signature & Stamp:	Verified by: TNB's Representative Signature & Stamp:
Name: MOHD TARMIZI ALIAS	Name:
Date: 29-11-2025	Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A4. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

4. Conduct Point-to-point Cable Termination Continuity Tests.
5. Conduct Short to Ground (Leakage) test for each connector pin.
6. Record test results in [1] **Termination Continuity Test Sheet**.

[1] **TERMINATION CONTINUITY TEST SHEET**

Feeder No.: X20287

Feeder Name: TX2

19 cores, 1.5 mm sq, armoured (Alarm & Control cables) *Note: Please add/edit according to station's requirement

Cable No.	Core No.	Signal	From	To	Termination Continuity Test	Short to Ground (Leakage) Test	REMARKS
LBS-3	1	Earth	RCB	SG PANEL	✓	Not applicable	
LBS-3	2	Gas Low Alarm	RCB	SG PANEL	✓	✓	
LBS-3	3	Spare	RCB	SG PANEL	✓	✓	
LBS-3	4	LBS Status Open	RCB	SG PANEL	✓	✓	
LBS-3	5	LBS Status Close	RCB	SG PANEL	✓	✓	
LBS-3	6	Earth Switch Status Open	RCB	SG PANEL	✓	✓	
LBS-3	7	Earth Switch Status Close	RCB	SG PANEL	✓	✓	
LBS-3	8	Common Return Pin (4,5,6,7)	RCB	SG PANEL	✓	✓	
LBS-3	9	Local / Remote Indication	RCB	SG PANEL	✓	✓	
LBS-3	10	Trip Circuit Supervision	RCB	SG PANEL	✓	✓	
LBS-3	11	Overcurrent	RCB	SG PANEL	✓	✓	
LBS-3	12	Earth Fault	RCB	SG PANEL	✓	✓	
LBS-3	13	IRF & Comm Fail	RCB	SG PANEL	✓	✓	
LBS-3	14	Current Diff / Spare	RCB	SG PANEL	✓	✓	
LBS-3	15	Common Return Pin (9-14)	RCB	SG PANEL	✓	✓	
LBS-3	16	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-3	17	Command From R/S Close	RCB	SG PANEL	✓	✓	
LBS-3	18	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-3	19	Command From R/S Open	RCB	SG PANEL	✓	✓	

4 cores, 1.0 mm sq, non-armoured (EFI signal cables)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
EFI3		Common	EFI	RCB	✓	
EFI3		EFI Indication	EFI	RCB	✓	
EFI3		CO-Common	EFI	RCB	✓	
EFI3		EFI Reset	EFI	RCB	✓	

Test Observations:

Test Result: **PASS** ☒ **FAIL** ☐

Checks conducted by:
Contractor's Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Date: 29-11-2025

Verified by:
TNB's Representative Signature & Stamp:

Name:

Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A4. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

4. Conduct Point-to-point Cable Termination Continuity Tests.
5. Conduct Short to Ground (Leakage) test for each connector pin.
6. Record test results in [1] **Termination Continuity Test Sheet**.

[1] **TERMINATION CONTINUITY TEST SHEET**

Feeder No.: X20288

Feeder Name: ELMINA (D) NO 9

19 cores, 1.5 mm sq, armoured (Alarm & Control cables) *Note: Please add/edit according to station's requirement

Cable No.	Core No.	Signal	From	To	Termination Continuity Test	Short to Ground (Leakage) Test	REMARKS
LBS-4	1	Earth	RCB	SG PANEL	✓	Not applicable	
LBS-4	2	Gas Low Alarm	RCB	SG PANEL	✓	✓	
LBS-4	3	Spare	RCB	SG PANEL	✓	✓	
LBS-4	4	LBS Status Open	RCB	SG PANEL	✓	✓	
LBS-4	5	LBS Status Close	RCB	SG PANEL	✓	✓	
LBS-4	6	Earth Switch Status Open	RCB	SG PANEL	✓	✓	
LBS-4	7	Earth Switch Status Close	RCB	SG PANEL	✓	✓	
LBS-4	8	Common Return Pin (4,5,6,7)	RCB	SG PANEL	✓	✓	
LBS-4	9	Local / Remote Indication	RCB	SG PANEL	✓	✓	
LBS-4	10	Trip Circuit Supervision	RCB	SG PANEL	✓	✓	
LBS-4	11	Overcurrent	RCB	SG PANEL	✓	✓	
LBS-4	12	Earth Fault	RCB	SG PANEL	✓	✓	
LBS-4	13	IRF & Comm Fail	RCB	SG PANEL	✓	✓	
LBS-4	14	Current Diff / Spare	RCB	SG PANEL	✓	✓	
LBS-4	15	Common Return Pin (9-14)	RCB	SG PANEL	✓	✓	
LBS-4	16	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-4	17	Command From R/S Close	RCB	SG PANEL	✓	✓	
LBS-4	18	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-4	19	Command From R/S Open	RCB	SG PANEL	✓	✓	

4 cores, 1.0 mm sq, non-armoured (EFI signal cables)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
EFI4		Common	EFI	RCB	✓	
EFI4		EFI Indication	EFI	RCB	✓	
EFI4		CO-Common	EFI	RCB	✓	
EFI4		EFI Reset	EFI	RCB	✓	

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Verified by:
TNB's Representative Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Name:

Date: 29-11-2025

Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A4. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

4. Conduct Point-to-point Cable Termination Continuity Tests.
5. Conduct Short to Ground (Leakage) test for each connector pin.
6. Record test results in **[1] Termination Continuity Test Sheet**.

[1] TERMINATION CONTINUITY TEST SHEET

Feeder No.: X20289

Feeder Name: SSU ELMINA ILHAM NO 2

19 cores, 1.5 mm sq, armoured (Alarm & Control cables) *Note: Please add/edit according to station's requirement

Cable No.	Core No.	Signal	From	To	Termination Continuity Test	Short to Ground (Leakage) Test	REMARKS
LBS-5	1	Earth	RCB	SG PANEL	✓	Not applicable	
LBS-5	2	Gas Low Alarm	RCB	SG PANEL	✓	✓	
LBS-5	3	Spare	RCB	SG PANEL	✓	✓	
LBS-5	4	LBS Status Open	RCB	SG PANEL	✓	✓	
LBS-5	5	LBS Status Close	RCB	SG PANEL	✓	✓	
LBS-5	6	Earth Switch Status Open	RCB	SG PANEL	✓	✓	
LBS-5	7	Earth Switch Status Close	RCB	SG PANEL	✓	✓	
LBS-5	8	Common Return Pin (4,5,6,7)	RCB	SG PANEL	✓	✓	
LBS-5	9	Local / Remote Indication	RCB	SG PANEL	✓	✓	
LBS-5	10	Trip Circuit Supervision	RCB	SG PANEL	✓	✓	
LBS-5	11	Overcurrent	RCB	SG PANEL	✓	✓	
LBS-5	12	Earth Fault	RCB	SG PANEL	✓	✓	
LBS-5	13	IRF & Comm Fail	RCB	SG PANEL	✓	✓	
LBS-5	14	Current Diff / Spare	RCB	SG PANEL	✓	✓	
LBS-5	15	Common Return Pin (9-14)	RCB	SG PANEL	✓	✓	
LBS-5	16	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-5	17	Command From R/S Close	RCB	SG PANEL	✓	✓	
LBS-5	18	Command From R/S Common	RCB	SG PANEL	✓	✓	
LBS-5	19	Command From R/S Open	RCB	SG PANEL	✓	✓	

4 cores, 1.0 mm sq, non-armoured (EFI signal cables)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
EFI5		Common	EFI	RCB	✓	
EFI5		EFI Indication	EFI	RCB	✓	
EFI5		CO-Common	EFI	RCB	✓	
EFI5		EFI Reset	EFI	RCB	✓	

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Verified by:
TNB's Representative Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Name:

Date: 29-11-2025

Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A1. TERMINATION CONTINUITY TEST (RCB MULTIPIN AHM)

1. Conduct Point-to-point Cable Termination Continuity Tests.
2. Record test results in [1] Termination Continuity Test Sheet.

[1] TERMINATION CONTINUITY TEST SHEET

PE Name: SSU ELMINA ILHAM NO. 1

4 cores, 4 mm sq (coloured armoured) - AC cable for Battery Charger

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
AC-BC1	RED	Line	DB	BC	✓	
AC-BC1	BLUE	Neutral	DB	BC	✓	
AC-BC1	YELLOW	Earth	DB	BC	✓	
AC-BC1	BLACK	Spare	DB	BC	✓	

4 cores, 1.5 mm sq, armoured (Battery Charger alarms)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
BC1		Common	BC	RCB	✓	
BC1		Battery Charger Alarm 1	BC	RCB	✓	
BC1		SPARE	BC	RCB	✓	
BC1		SPARE	BC	RCB	✓	
BC2		Common	BC	RCB	✓	
BC2		Battery Charger Alarm 1	BC	RCB	✓	
BC2		SPARE	BC	RCB	✓	
BC2		SPARE	BC	RCB	✓	

2 cores, 2.5 mm sq, armoured (DC Cable)

Cable No.	Core No.	Signal	From	To	Test Result	REMARKS
BC1 - RCB	RED	+30VDC	BC	RCB	✓	
BC1 - RCB	BLACK	-30VDC	BC	RCB	✓	

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Verified by:
TNB's Representative Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Name:

Date: 29-11-2025

Date: 06-01-2026 15:23:42

**SITE ACCEPTANCE TEST (SAT)
PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN**



Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
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A2. RCB CONTROL OPERATION INTERLOCK TEST

1. Conduct Point-to-point Cable Termination Continuity Tests.
2. Record test results in [1] Termination Continuity Test Sheet.

SSU ELMINA ILHAM NO. 1

[2]	RCB CONTROL OPERATION INTERLOCK TEST SHEET		
PE Name:			
RCB brand:	MULTIPIN AHM		
RCB type:	RCB Conventional	RCB Multi-pin	✓

Test Conditions:

- The Earth Switch is at ON position (at all times) during the tests.
- The test is conducted with the breaker at half-racked in position at the VCB switchgear cubicle (Test Position)
- The breaker Test Plug is inserted into the switchgear cubicle connector to activate the Control Operation..
- To connect 30 Vdc supply for status indication change at RCB (from dry contact to wet contact)

1. Test Conducted at the Switchgear:

Breaker Local/Remote Position	Breaker Trip/Close Switch		Test Result ("✓" Passed / "X" Failed)
	TRIP	CLOSE	
LOCAL	✓	✓	✓
REMOTE	X	X	✓

2. Test Conducted at the RCB

Breaker L/R Position	RCB R/S Position	RCB Trip/Close Switch		Test Result ("✓" - Passed / "X" - Failed)
		TRIP	CLOSE	
LOCAL	REMOTE	X	X	✓
LOCAL	SUPERVISORY	X	X	✓
REMOTE	REMOTE	✓	✓	✓
REMOTE	SUPERVISORY	X	X	✓

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Name: MOHD TARMIZI ALIAS

Date: 29-11-2025

Verified by:
TNB's Representative Signature & Stamp:

Name:

Date: 06-01-2026 15:23:42



Nama Aktiviti: PENGUJIAN MULATUGAS SISTEM 30VDC LOW MAINTENANCE

Pencawang : SSU ELMINA ILHAM NO. 1
Tarikh Mulatugas : 29-11-2025
Bilangan Charger : 1
Kegunaan DC : RTU
Jika VCB, Bilangan VCB :
Jenama charger / model : BERKAT INSAF
Serial no charger : B23373
Bulan/Tahun Penghantaran : 2025-10
Jenama bateri / model : SAFT UP1M40-4
Bulan/Tahun Pembuatan : 2025-07

Activiti	Keterangan MCB Aktiviti		Tandakan (✓)	
1	Pastikan sistem DC telah siap dipasang kecuali kabel dari pengecas ke bateri & pengecas ke beban.		✓	
2	Pastikan semua MCB pada pengecas bateri dalam keadaan terbuka (OFF).		✓	
Activiti	Keterangan Aktiviti	Julat Bacaan	Ambil Bacaan	
3	Semak bacaan voltan pembekal masuk AC (L-N) pada terminal blok pengecas bateri.	216 - 252 Vac	240	
Activiti	Keterangan Aktiviti		Tandakan (✓)	
4	Pastikan Suis Mode berada dalam kedudukan Manual. Hidupkan (ON) MCB AC, Bateri & Beban.		✓	
Activiti	Keterangan Aktiviti	Julat Bacaan	Ambil Bacaan	
5	Pastikan LED Manual Float menyala. Ukur voltan pada terminal blok ke beban.	27 - 31.5 Vdc (terminal positive ke negative)	30.9	
6	Pusingkan suis ke Boost. Pastikan LED Manual Boost menyala. Ukur voltan pada terminal blok ke beban.	27 - 31.5 Vdc (terminal positive ke negative)	31.1	
"Jika julat voltan untuk Float atau Boost tidak dipatuhi,matikan (OFF) semua MCB. Laporkan dalam Sistem Maklumbalas Bahan(SMB) & hubungi pihak pembekal untuk pembaikan segera ditapak. "				
Activiti	Keterangan Aktiviti		Tandakan (✓)	
7	Pusing semula suis ke Float. Pastikan LED Manual Float menyala.		✓	
Activiti	Keterangan Aktiviti		Tandakan (✓)	
8	TEMPERATURE COMPENSATION (Float CHARGE MODE) Rekodkan juga bacaan & keputusan aktiviti 8(i) hingga 8(iv) pada pelekat mulatugas pada pintu pengecas.	i) Ambil bacaan voltan pengecas bateri pada terminal blok ke bateri.	33.42	
		ii) Rekod bacaan suhu pada paparan LCD.	28.4	
		iii) Rujuk Jadual Temperature Compensation pada pintu pengecas & rekodkan voltan Float Min & Max.	MIN	33.17
		MAX	33.84	
		iv)Adakah voltan 8(i) dalam julat voltan Float Min & Max? Ya(✓) atau Tidak(X)		✓
Activiti	Keterangan Aktiviti		Tandakan (✓)	
9	Pusingkan suis ke Boost. Pastikan LED Manual Boost menyala.		✓	
Activiti	Keterangan Aktiviti		Tandakan (✓)	
10	TEMPERATURE COMPENSATION (Boost CHARGE MODE) Rekodkan juga bacaan & keputusan aktiviti 10(i) hingga 10(iv) pada pelekat mulatugas pada pintu pengecas."	i) Ambil bacaan voltan pengecas bateri pada terminal blok ke bateri.	34.09	
		ii) Rekod bacaan suhu pada paparan LCD.	28.5	
		iii) Rujuk Jadual Temperature Compensation pada pintu pengecas & rekodkan voltan Boost Min & Max.	MIN	33.81
		MAX	34.49	
		iv)Adakah voltan 10(i) dalam julat voltan Boost Min & Max? Ya(✓) atau Tidak(X)		✓
"Jika julat voltan untuk Float atau Boost pada no 8(iv) & 10(iv) tidak dipatuhi, laporkan dalam Sistem Maklumbalas Bahan(SMB) & hubungi pihak pembekal untuk pembaikan segera ditapak. Jika julat voltan untuk Float & Boost dipatuhi, teruskan ke langkah seterusnya."				
Activiti	Keterangan Aktiviti		Tandakan (✓)	
11	Matikan (OFF) MCB pada pengecas bateri ke bateri & beban.		✓	
12	Lengkapkan sambungan kabel dari pengecas ke bateri & pengecas ke beban.		✓	
13	Hidupkan (ON) semula MCB pada pengecas bateri ke bateri & beban.		✓	
14	Pusing suis Charger Selector Mode ke Manual & Boost. Pusing semula ke Auto. Pastikan LED Charger Auto Boost menyala.		✓	
Pengecas akan bertukar ke Float secara Otomatik selepas 12 Jam.				

: MOHD TARMIZI ALIAS

Diuji Oleh



Contractor Signature

Disahkan Oleh

:

Tarikh : 29-11-2025

Tarikh : 29-11-2025

Analisa/Catatan :

Keputusan : LULUS

Perlu Tindakan Lanjutan : TIDAK

Tindakan Oleh :

Tarikh :



**TENAGA
NASIONAL BERHAD**

SENARAI SEMAK DAN UJIAN EFI UNTUK PROJEK DA / RECOMMISSION

Pencawang : SSU ELMINA ILHAM NO. 1
LITAR : INCOMING X20285
NO. SIRI : 1627182
JENIS EFI : EMG

OUTGOING X20288
OUTGOING 0889322001088024
OUTGOING NORTROLL

No	Ujian	Incoming	Outgoing	Komen
1	Test Kelip. Adakah EFI berfungsi dengan baik?	OK	OK	Lakukan test dan reset pada EFI tersebut. Untuk EFI endau semak External Indicator.
2	Adakah terdapat LV SUPPLY (230V) tersambung pada EFI?	OK	OK	Untuk jenama Cableroll 2310, jika tiada LV dipasang, perlu OFF kan bit 6 & 7
3	Bacaan bateri EFI : 3.6V Adakah bacaan voltan <3.0V?	OK	OK	Jika bacaan <3.0V bateri perlu ditukar
4	Ukurkan rintangan pada terminal CT pada EFI. Adakah CT yang terpasang pada kedudukan betul?	OK	OK	Sila lihat Lampiran 2 bagi contoh pemasangan CT yang betul. Nota: untuk menyemak penyambungan CT ke terminal EFI; bacaan dalam 20–30Ω atau kurang dari 100Ω (Cableroll & Endau) / 2.4kΩ (EMG)
5	Jalankan ujian secondary current injection pada CT menggunakan set Bowdens	OK	OK	Satu lilitan adalah arus sebanyak 10 A
6	Gunakan buzzer dan probe pada NO	OK	OK	Ada continuity jika jalankan current injection. Perlu keluarkan jumper jika ada

Tandakan 1 = Kedudukan bit pada DIP suis pada ON
Tandakan 0 = Kedudukan bit pada DIP suis pada OFF
(sila rujuk Lampiran 4 untuk definisi setiap bit)

Endau		
BIT NO	INC	OUT
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Soule Bardin			
	BIT NO	INC	OUT
S1 DIP SUIS	1		
	2		
	3		
	4		
S2 DIP SUIS	1		
	2		
	3		
	4		
	5		

CableTroll						
BIT NO	INC	OUT		Kedudukan	INC	OUT
1				1	0	0
2				2	0	0
3				3	1	1
4				4	0	0
5				5	0	0
6				6	1	1

EMG Easi-R						
DIP SUIS 1 (ATAS)	INC	OUT		DIP SUIS 1 (BAWAH)	INC	OUT
1	0	0		1		
2	0	0		2		
3	0	0		3		
4	1	1		4		
5	0	0		5		
6	1	1		6		



**TENAGA
NASIONAL BERHAD**

SENARAI SEMAK DAN UJIAN EFI UNTUK PROJEK DA / RECOMMISSION

Pencawang : SSU ELMINA ILHAM NO. 1
 LITAR : INCOMING X20289 OUTGOING
 NO. SIRI : 1581101 OUTGOING
 JENIS EFI : EMG OUTGOING

No	Ujian	Incoming	Outgoing	Komen
1	Test Kelip. Adakah EFI berfungsi dengan baik?	OK	OK	Lakukan test dan reset pada EFI tersebut. Untuk EFI endau semak External Indicator.
2	Adakah terdapat LV SUPPLY (230V) tersambung pada EFI?	OK	OK	Untuk jenama Cableroll 2310, jika tiada LV dipasang, perlu OFF kan bit 6 & 7
3	Bacaan bateri EFI : 3.6V Adakah bacaan voltan <3.0V?	OK	OK	Jika bacaan <3.0V bateri perlu ditukar
4	Ukurkan rintangan pada terminal CT pada EFI. Adakah CT yang terpasang pada kedudukan betul?	OK	OK	Sila lihat Lampiran 2 bagi contoh pemasangan CT yang betul. Nota: untuk menyemak penyambungan CT ke terminal EFI; bacaan dalam 20–30Ω atau kurang dari 100Ω (Cableroll & Endau) / 2.4kΩ (EMG)
5	Jalankan ujian secondary current injection pada CT menggunakan set Bowdens	OK	OK	Satu lilitan adalah arus sebanyak 10 A
6	Gunakan buzzer dan probe pada NO	OK	OK	Ada continuity jika jalankan current injection. Perlu keluarkan jumper jika ada

Tandakan 1 = Kedudukan bit pada DIP suis pada ON
 Tandakan 0 = Kedudukan bit pada DIP suis pada OFF
 (sila rujuk Lampiran 4 untuk definisi setiap bit)

Endau		
BIT NO	INC	OUT
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

Soule Bardin			
	BIT NO	INC	OUT
S1 DIP SUIS	1		
	2		
	3		
	4		
S2 DIP SUIS	1		
	2		
	3		
	4		
	5		

CableTroll						
BIT NO	INC	OUT		Kedudukan	INC	OUT
1				1		
2				2		
3				3		
4				4		
5				5		
6				6		

EMG Easi-R						
DIP SUIS 1 (ATAS)	INC	OUT		DIP SUIS 1 (BAWAH)	INC	OUT
1	0	0		1		
2	0	0		2		
3	0	0		3		
4	1	1		4		
5	0	0		5		
6	1	1		6		

SITE COMPLETION CHECKLIST (SCC) REMOTE TERMINAL UNIT SITE ACCEPTANCE TEST (SAT)			 TENAGA NASIONAL		
Doc No.	SCC - RTU (SAT)	Rev. No.	1	Date	5 June 2020

Note: Please sketch the building layout and the location of:

- a. RCB panel
- b. Battery Charger
- c. EFIs location
- d. Switchgear Panel
- e. RTU Panel

SITE DRAWING:

SITE ACCEPTANCE TEST (SAT) PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN			 TENAGA NASIONAL		
Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB131/2024			
FUNCTIONAL LOCATION :		BSAM/PCE/J02351			
SUBSTATION NAME :		SSU ELMINA ILHAM NO. 1			
OVERALL PICTURE OF SUBSTATION OUTER WALL (WITH SUBSTATION NAME)		SAMPLE OF COMPLETED MULTI-CORE CABLE TERMINATION (AT SWITCHGEAR'S SIDE)		SAMPLE OF COMPLETED MULTI-CORE CABLE TERMINATION (INSIDE RCB)	
SAMPLE OF COMPLETED MULTI-CORE CABLE TERMINATION (INSIDE RCB) SECOND PICTURE (IF ANY)		SAMPLE OVERVIEW OF RCB'S SINGLE LINE DIAGRAM (COMPLETE WITH FEEDER NUMBERS)		SAMPLE OVERVIEW OF RCB'S SINGLE LINE DIAGRAM (COMPLETE WITH FEEDER NUMBERS) SECOND PICTURE (IF ANY)	
OVERALL PICTURE OF WIRING LIST INSIDE RCB PANEL		OVERALL PICTURE OF RCB SCHEMATIC DIAGRAM INSIDE RCB PANEL		RCB (COMPLETE WARRANTY STICKER)	

SITE ACCEPTANCE TEST (SAT) PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN			 TENAGA NASIONAL		
Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB131/2024			
FUNCTIONAL LOCATION :		BSAM/PCE/J02351			
SUBSTATION NAME :		SSU ELMINA ILHAM NO. 1			
OVERVIEW OF EFI(s) AFTER INSTALLATION		OVERVIEW OF EFI(s) AFTER INSTALLATION SECOND PICTURE (IF ANY)		OVERVIEW OF EFI(s) AFTER INSTALLATION THIRD PICTURE (IF ANY)	
SAMPLE EFI'S CT CABLE AT SWITCHGEAR (AFTER CLAMPED)		SAMPLE EFI'S CT CABLE AT SWITCHGEAR (AFTER CLAMPED) SECOND PICTURE (IF ANY)		SAMPLE EFI'S CT CABLE AT SWITCHGEAR (AFTER CLAMPED) THIRD PICTURE (IF ANY)	
BATTERY CHARGER (COMPLETE WARRANTY STICKER)		OVERVIEW OF BATTERY CHARGER (COMPLETE WITH 30VDC LOW MAINTENANCE SYSTEM COMMISSIONING CHECKLIST) INSIDE BATTERY CHARGER		INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO EARTH STUD AT RCB PANEL	

SITE ACCEPTANCE TEST (SAT) PLANT INTERFACING WORK (PIW) VCB - SHUTDOWN			 TENAGA NASIONAL		
Doc No.	SAT PIW - VCB	Rev. No.	1	Date	5 JUNE 2020
A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB131/2024			
FUNCTIONAL LOCATION :		BSAM/PCE/J02351			
SUBSTATION NAME :		SSU ELMINA ILHAM NO. 1			
INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO EARTH STUD AT RCB PANEL SECOND PICTURE (IF ANY)		INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO SWITCHGEAR TERMINATION BOX		INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO SWITCHGEAR TERMINATION BOX SECOND PICTURE (IF ANY)	

VERIFIED BY TNB

TNB Personnel:

Verified at: 06-01-2026 15:23:42