

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

CONTRACT TITLE :

**PEMBEKALAN, PEMASANGAN DAN PENGUJIAN FASILITI DISTRIBUTION AUTOMATION SECARA BERSEPADU
(INTEGRATED INTER-CHANGEABLE DA), DISTRIBUTION NETWORK DIVISION, TNB – MAINHEAD B: SELANGOR
(TERMASUK PUTRAJAYA/CYBERJAYA)**

CONTRACT NO. :	TNB767/2024				
CONTRACTOR :	HASILWAN SDN BHD				
DATE :	23-01-2026				
SUBSTATION NAME :	PE EMPURAU NO 2				
FUNCTIONAL LOCATION :	BRWG/PCE/J02413				
SUBZONE :	BRWG				
STATE :	SELANGOR				
RTU BRAND :	DONG FANG				
RTU SERIAL NUMBER :	RMU BM0054				
RTU TYPE : Tick "✓" whichever applicable	VCB		M-RMU	✓	

SITE COMPLETION CHECKLIST (SCC) REMOTE TERMINAL UNIT (INSTALLATION)			 TENAGA NASIONAL		
Doc No.	SCC - RTU (INS)	Rev. No.	1	Date	5 June 2020
A1. SCC RTU (DURING INSTALLATION)					
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			
Check boxes as follows: (✓) OK NI : Need Improvement (Pls. give comments at 'Remark' column)					
No.	Description	OK	NI	REMARKS	
1. Visual Checks on RTU Cabinet					
i.	RTU cabinet is properly mounted & aligned at the wall / designated area.	✓			
ii.	QR code / label is available inside RTU Cabinet. Scan QR code and check contact (must be as per requirement in SOW). [* If available for this contract]	✓			
iii.	All wirings to the terminal blocks are terminated tightly and terminal blocks are in good condition.	✓			
iv.	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 and Physical Checks on Cablings and Terminations					
i.	All non-armoured cables shall be installed in rigid high impact PVC conduits, neatly secured in position and adequately supported where necessary in an approved manner.	✓			
ii.	For armoured cables, cable supports, elbows, cleats, trays shall be used. All materials must be of galvanised type (of at least 1.2 mm in thickness).	✓			
iii.	The size of the PVC conduit shall be 25 mm in diameter and the colour of the conduit and fittings shall be orange. The conduits shall be fixed by means of saddles secured rigidly at intervals not exceeding 750 mm.	✓			
iv.	Cable supports/brackets/elbows shall be installed at intervals not greater than 1500 mm for vertical runs and not greater than 1000 mm for horizontal runs. The brackets shall be derusted, finished in a primer and coated with standard orange enamel. The brackets/elbows shall not be painted.	✓			
3. Visual Checks on Installations					
a. RTU equipment					
i.	All cablings and internal wirings for RTU modules and accessories are laid properly & neatly secured.	✓			
ii.	All spares and unused points/modules/cards are wired internally, configured and ready for terminations from Plant (complete with its terminal blocks/connectors/wires and all other necessary accessories).	✓			
iii.	All cables for I/O signal, AC, DC & Ground are laid & terminated according to RTU Technical Specification.	✓			
iv.	Anti static wrist strap need to be installed on ESD bonding points.	✓			
Observations:					
Checks conducted by: Contractor's Signature & Stamp:			Verified by: TNB's Representative Signature & Stamp:		
					
Name: SYAHRULL SYAZLLY BIN AZMAN SHAH			Name:		
Date: 23-01-2026			Date:		

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

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**PEMBEKALAN, PEMASANGAN DAN PENGUJIAN FASILITI DISTRIBUTION AUTOMATION SECARA BERSEPADU
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RTU BRAND :	DONG FANG				
RTU SERIAL NUMBER :	RMU BM0054				
RTU TYPE : Tick "✓" whichever applicable	VCB		M-RMU	✓	

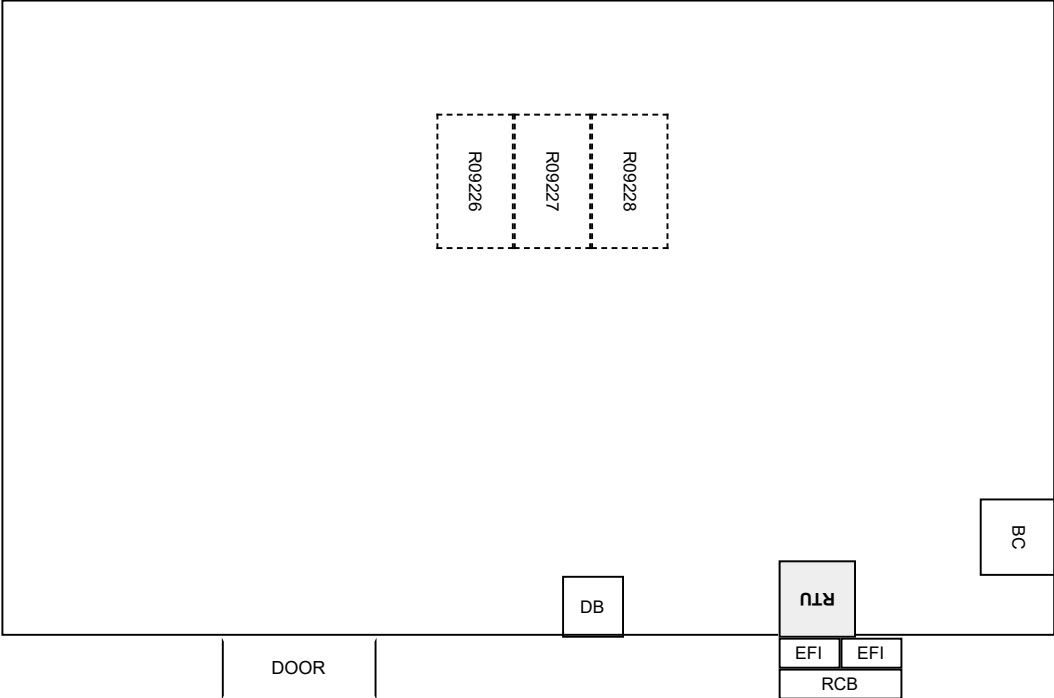
SITE COMPLETION CHECKLIST (SCC) REMOTE TERMINAL UNIT SITE ACCEPTANCE TEST (SAT)			 TENAGA NASIONAL		
Doc No.	SCC - RTU (SAT)	Rev. No.	1	Date	5 June 2020
A1. SCC RTU (DURING INSTALLATION)					
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			
Check boxes as follows: (✓) OK NI : Need Improvement (Pls. give comments at 'Remark' column)					
No.	Description	OK	NI	REMARKS	
1.	Visual Checks on RTU Cabinet				
i.	Nameplate/Sticker with information on Serial Number, Site Acceptance Test (SAT) date & Warranty period is available in cabinet.	✓			
ii.	SAT date must be written clearly & in the correct text position on the Nameplate/Sticker.	✓			
2.	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 TNB supervisor / representative	✓			
iii.	Check & verify all necessary tests are performed as required & have passed.	✓			
iv.	Approved Engineering Drawing at least Tab 2 (RTU CONFIGURATION DRAWING) , Tab 3 (RTU CUBICLE INTERNAL WIRING DRAWING) and Tab 5 (RTU CONFIGURATION DRAWING) .	✓			
Test Observations:					
Checks conducted by: Contractor's Signature & Stamp:			Verified by: TNB's Representative Signature & Stamp:		
					
Name: SYAHRULL SYAZLLY BIN AZMAN SHAH			Name:		
Date: 23-01-2026			Date:		

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
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			

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:



Remote Terminal Unit (RTU) Site Acceptance Test Procedures			 TENAGA NASIONAL		
Doc No.	SAT TP-RTU	Rev. No.	1	Date	5 June 2020

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DATE :	23-01-2026			
SUBSTATION NAME :	PE EMPURAU NO 2			
FUNCTIONAL LOCATION :	BRWG/PCE/J02413			
SUBZONE :	BRWG			
STATE :	SELANGOR			
RTU BRAND :	DONG FANG			
RTU SERIAL NUMBER :	RMU BM0054			
FIRMWARE VERSION :	DFE ENGINEER TOOLS SOFTWARE		RTU	
	Version 3.02.009 ☒		Version 4.11.024 ☒	
RTU TYPE : Tick "✓" whichever applicable	VCB		M-RMU	✓

Remote Terminal Unit (RTU) Site Acceptance Test Procedures			 TENAGA NASIONAL		
Doc No.	SAT TP-RTU	Rev. No.	1	Date	5 June 2020

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Remote Terminal Unit (RTU) Site Acceptance Test Procedures			 TENAGA NASIONAL		
Doc No.	SAT TP-RTU	Rev. No.	1	Date	5 June 2020
A1. RTU SYSTEM'S FUNCTIONAL CHECK					
Test Ref: RTU System's Functional Check FC.1					
a) RTU Power Up and Health Check					
No.	Inspection Item	Check (✓)	REMARKS		
1	i. Switch on the RTU load MCB at battery charger. Measure the voltage across the input to the RTU DC MCB and ensure that the reading is within Nominal Voltage which is $\pm 10\%$ ii. Check the DC MCB rating	Done	DC Voltage = 30 Vdc DC MCB Rating = 6 Amp		
2	i. Switch on the AC source to RTU cabinet. Measure the voltage across the AC input MCB and ensure that the reading is within $240\text{ V} \pm 10\%$ ii. Check the AC MCB rating.	Done	DC Voltage = 240 Vac DC MCB Rating = 16 Amp		
b) RTU Control Enable/Disable					
No.	Inspection Item	Check (✓)	REMARKS		
1	At the CES switch marked 'CES', set the switch to the ON and OFF state and execute a control command using Protocol Analyser. (Note : ON – can control, OFF – cannot control)	Done			
Test Observations:					
Test Result: PASS ☒ FAIL ☐					
Checks conducted by: Contractor's Signature & Stamp:			Verified by: TNB's Representative Signature & Stamp:		
					
Name: SYAHRULL SYAZLLY BIN AZMAN SHAH			Name:		
Date: 23-01-2026			Date:		

Remote Terminal Unit (RTU) Site Acceptance Test Procedures			 TENAGA NASIONAL		
Doc No.	SAT TP-RTU	Rev. No.	1	Date	5 June 2020
A2. RTU SYSTEM'S DIGITAL OUTPUT					
Test Ref: Point Test - Digital Output DO.1					
No.	Inspection Item	Check (✓)	REMARKS		
1	Isolate terminal block links at the marshalling panel. Establish communication between Protocol Analyser and RTU.	Done			
2	From Protocol Analyser, send control command to the Dummy Breaker and observe the result. Check the Digital Feedback.	Done			
3	From Protocol Analyser, send control command to the others RTU points and observe the result. Test all DO point and record in Master Sheet.	YES			
Test Observations:					
Test Result: PASS ☒ FAIL ☐					
Checks conducted by: Contractor's Signature & Stamp:			Verified by: TNB's Representative Signature & Stamp:		
					
Name: SYAHRULL SYAZLLY BIN AZMAN SHAH			Name:		
Date: 23-01-2026			Date:		

**Remote Terminal Unit (RTU)
Site Acceptance Test Procedures**



Doc No.

SAT TP-RTU

Rev. No.

1

Date

5 June 2020

A3. RTU SYSTEM'S DIGITAL INPUT

Test Ref:

Point Test - Digital Input

DI.1

No.	Inspection Item	Check (✓)	REMARKS
1	Isolate terminal block links at the marshalling panel. Establish communication between Protocol Analyser and RTU.	Done	
2	Initiate status from the selected point and observe status reported at Protocol Analyser.	YES	
	Test all DI points and record in Master Sheet.		

Test Observations:

Test Result: PASS ☒ FAIL ☐

Checks conducted by:
Contractor's Signature & Stamp:

Verified by:
TNB's Representative Signature & Stamp:



Name: SYAHRULL SYAZLLY BIN AZMAN SHAH

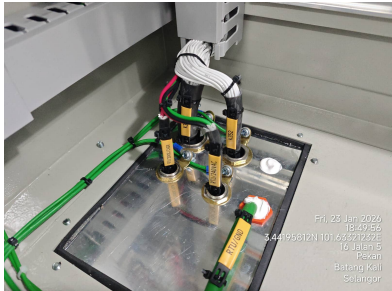
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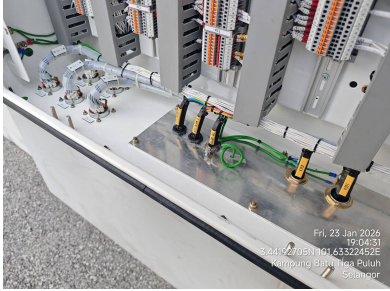
Date: 23-01-2026

Date:

Remote Terminal Unit (RTU) Site Acceptance Test Procedures			 TENAGA NASIONAL		
Doc No.	SAT TP-RTU	Rev. No.	1	Date	5 June 2020
A5. RTU SYSTEM'S GENERAL ALARM					
Test Ref: RTU System's General Alarm GE.1					
Test Objective:					
1. To verify the RTU should initiate an alarm due to detection of a malfunction on the IO module.					
Test Procedure:					
No.	Inspection Item	Check (✓)	REMARKS		
1	Confirm that no alarms are active and the RTU is not in program mode.	Done			
2	Disconnect the 'Link' port at an IO module to initiate a general alarm.	Done			
3	Check 'RTU Fault Alarm' indicator is lit and at DI point configured for IO module alarm.	Done			
Test Observations:					
Test Result: PASS ☒ FAIL ☐					
Checks conducted by: Contractor's Signature & Stamp:			Verified by: TNB's Representative Signature & Stamp:		
					
Name: SYAHRULL SYAZLLY BIN ABU MAN SHAH			Name:		
Date: 23-01-2026			Date:		

SITE COMPLETION CHECKLIST (SCC) REMOTE TERMINAL UNIT (INSTALLATION)			 TENAGA NASIONAL		
Doc No.	SCC - RTU (INS)	Rev. No.	1	Date	5 June 2020
A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			
BEFORE INSTALLATION					
 23 Jan 2026 16:06:33 Kampung Batu Tiga Puluh Selangor		 23 Jan 2026 16:08:35 16 Jalan 5 Pekan Batang Kali Selangor			
OVERALL PICTURE OF SUBSTATION OUTER WALL (WITH SUBSTATION NAME)		DESIGNATED SPACE/WALL FOR RTU BEFORE			
AFTER INSTALLATION					
 23 Jan 2026 16:14:52 16 Jalan 5 Pekan Batang Kali Selangor					
RTU AFTER INSTALLATION					

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A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			
					
OVERALL PICTURE OF SUBSTATION OUTER WALL (WITH SUBSTATION NAME)		RTU AFTER INSTALLATION (WITH INSIDE PICTURE)		RTU WARRANTY STICKER (COMPLETE WITH SAT DATE)	
					
OVERALL PICTURE OF MASTERSHEET INSIDE RTU PANEL		CABLES GLAND INSIDE RTU PANEL			
					
INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO RTU EARTH BAR		INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO EARTH STUD AT RCB PANEL		INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO EARTH STUD AT RCB PANEL SECOND PICTURE (IF ANY)	

Remote Terminal Unit (RTU) Site Acceptance Test Procedures					
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A2. PICTURES (BEFORE & AFTER DURING PRE-CABLING & INSTALLATION)					
CONTRACT NO. :		TNB767/2024			
FUNCTIONAL LOCATION :		BRWG/PCE/J02413			
SUBSTATION NAME :		PE EMPURAU NO 2			
					
INDIVIDUAL EARTHING CONNECTIONS COMPLETED FOR I/O CABLES TO EARTH STUD AT RCB PANEL THIRD PIC (IF ANY)		INSTALLATION INDIVIDUAL EARTHING FOR SPD TO RTU EARTH BAR		ANTI STATIC WRIST STRAP NEED TO BE INSTALLED ON ESD BONDING POINTS	

VERIFIED BY TNB

TNB Personnel:

Verified at: 23-01-2026 22:32:20