		fechnology Sir	gapore		SYS	TEM TEST PLAN	/ TEST RESU	LTS								
	Project Name						SPEM C									
	RS version				1.4			Firmware /Sof	tware version				Ver2.2			1
Test	Environment D	etails	A voltmet	ter is connected acro s	iss 1S and 2S and two ammeters, one in series with 1S and 1L a erial port is connected to the PC via cables for checking parame	and other in series with ter values.	2S and 2L The	Test t Details/Config				Pulsar source	ce,LNG reference meter	r,DSO,Multimeter		STANDARD
																STANDARD
					System Test Cases	Input Test	Values		1	Expected	d Recult			Inference on the		
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario	5	input rest	Values	Test Case		Expedies			Actual Result	acceptability of the results	Remarks (If any)	
				Description		Data Element	Input Values	Designed For	Output Parameter	UOM	Lower Limit	Upper Limit				
						Phase Voltage	240V							ок		
				Power	Voltmeter across input supply and ammeter in series with]			As low as					
1	T1		H01	Consumption of System	supply	Dhees Current	10A	sv	Volt-Ampere	VA	possible	8	0.9VA			
						Phase Current		-								
						Frequency	50Hz						ļ			
					The system is operated at voltage which is -20% below the nominal operating voltage which will be applied between 1S	Phase Voltage	192V	-						ок		-
					and 2S.At this voltage,six different current values are specified for testing which will be adjusted by obsevring the reading on	Phase Current	500mA									
			R01,R02, R04,R05,		the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for	Frequency	50Hz				Test result					
2	Т3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	accuracy.PF is varied between 0.5 lag and unity throughout these tests. Under these conditions,KWh is measured and checked for accuracy as per International Standard	PF	1	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 + 2.1%	1			CBIP88 IS13779
			H08,H11, H19		structure of use of the set will commence when the enter key is pressed thereafter exactly after one minute the enter key was been been adjust out the denter key was the adjust. During this duration, the EUT and a caliberated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS22 port.	Time	1min				2.1%		0.08%			
			R01,R02, R04.R05.			Phase Voltage Phase Current	192V 500mA	-			Test result		0.08%	ок		
3	Т3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 0.5lag	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 +2.1%	1			CBIP88 IS13779
			H05,H07, H08,H11,			Time	1min				2.1%	72.1%	0.17%			
			R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current	192V 1A 50Hz				Test result of test	Test result	_	OK		
4	Т3		R10,H04, H05.H07.	KWh	do	Frequency PF Time	1 1 1min	BVA	Active Energy	% Error	no.59 - 2.1%	of test no.59 +2.1%				CBIP88
			H08,H11, R01,R02,			Phase Voltage	192V						-0.10%	ок		IS13779
5	Т3		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	1A 50Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				
5	10		R10,H04, H05,H07,	KWh		PF Time	0.5lag 1min	5171	ridare Energy	70 Entor	no.59 -3%					CBIP88
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	192V 2A	-			Test result		0.30%	ок		IS13779 CBIP88
6	тз		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59				
			H05,H07, H08,H11,			Time	1min				2.1%	+2.1%	-0.30%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	192V 2A				Test result	Test result		ок		CBIP88
7	Т3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.5lag 1min	BVA	Active Energy	% Error		of test no.59 +3.0%				
			H08,H11,			Phase Voltage	192V	-					0.08%	ок		CBIP88
8	тз		R04,R05, R06,R07, R10,H04,	Accuracy Test of	do	Phase Current Frequency	10A 50Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				
0	15		H05,H07, H08.H11.	KWh	00	PF Time	1 1min	DVA	Active Energy	76 EITO	no.59 - 2.1%	+2.1%				
			R01,R02, R04.R05.			Phase Voltage Phase Current	192V 10A						-0.35%	ок		CBIP88
9	тз		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 0.5lag	BVA	Active Energy	% Error		of test no.59				
			H05,H07, H08,H11,			Time	1min				no.59 -3%	+3.0%	0.15%			CBIP88
10	тз		R04,R05, R06,R07,	Accuracy Test of	do	Phase Voltage Phase Current Frequency	192V 30A 50Hz	BVA	Anti-a France	°	Test result of test	Test result		ок		CBIP88
10	13		R10,H04, H05,H07,	KWh	do	PF Time	1 1min	BVA	Active Energy	% Error	no.59 - 2.1%	of test no.59 +2.1%	0.15%			
			R01,R02, R04.R05.			Phase Voltage Phase Current	192V 30A	-					0.15%	ок		CBIP88
11	Т3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 0.5lag	BVA	Active Energy	% Error	Test result of test no.59 -3%	of test no.59	1			
			H05,H07, H08,H11,			Time	1min				10.38 -376	13.076	0.10%			
			R01,R02, R04,R05, R06,R07.	Accuracy Test of		Phase Voltage Phase Current Frequency	192V 60A 50Hz	-			Test result of test	l est result		ок		CBIP88
12	Т3		R10,H04, H05,H07,	KWh	do	PF	1 1min	BVA	Active Energy	% Error	no.59 - 2.1%	of test no.59 + 2.1%				
			H08,H11, R01,R02,			Phase Voltage	192V	1					-0.34%	ок		CBIP88
13	тз		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	60A 50Hz 0.5lag	BVA	Active Energy	% Error	Test result of test	of test no.59				
			R10,H04, H05,H07, H08,H11,	NVVI)		PF Time	0.5lag 1min	1			no.59 -3%	+ 3%	-0.01%			
			R01,R02,		The system is operated at voltage which is +15% above the nominal operating voltage which will be applied between 1S	Phase Voltage Phase Current	276V 500mA							ок		CBIP88
			R04,R05, R06,R07,	Accuracy Test of	and 2S At this voltage, six different current values are specified for testing which will be adjusted by obsevring the reading on	Frequency PF	50Hz 1				Test result of test	restresuit				
14	Т3		R10,H04, H05,H07,	KWh	the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for	Time	1min	BVA	Active Energy	% Error	no.59 - 2.1%	of test no.59 + 2.1%				
			H08,H11, H19		accuracy.PF is varied between 0.5 lag and unity throughout these tests. Under these conditions,KWh is measured and checked for accuracy as per International Standard								0.33%			
			R01,R02, R04,R05,		encente na estandor de por mital laconal daniadu	Phase Voltage Phase Current	276V 500mA				Tert row "	Test result		ок		CBIP88
15	Т3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 0.5lag	BVA	Active Energy	% Error	Test result of test no.59 -3%	of test no.59			1	
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 276V	-					0.50%	ок		CBIP88
10			R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current Frequency	1A 50Hz		A	a =-	Test result of test	restresuit				
16	Т3		R10,H04, H05,H07,	KWh	do	PF Time	1 1min	BVA	Active Energy	% Error	no.59 - 2.1%	of test no.59 + 2.1%				
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	276V	-			<u> </u>		-0.10%	ок		CBIP88
17	тз		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	1A 50Hz 0.5lag	BVA	Active Energy	% Error	Test result of test	of test no.59	1			
			H05,H07, H08,H11,			Time	1min	1			no.59 -3%	+ 3%	0.10%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	276V 2A				Test result	Test result		ок		CBIP88
18	Т3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 1	BVA	Active Energy	% Error	of test no.59 -	of test no.59 + 2.1%				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 276V	<u> </u>			2.1%		-0.05%	ок		CBIP88
	тз		R04,R05, R06,R07,	Accuracy Test of		Phase Current	276V 2A 50Hz	BVA	Action Form	96 F	Test result					
10			R10.H04.	KWh	do	Frequency PF	0.5lag	BVA	Active Energy	% Error		of test no.59 + 3%	1			
19	15		H05,H07, H08,H11,			Time	1min				no.59 -3%	+ 3%	0.20%			

Renesas Technology Singapore SYSTEM TEST PLAN / TEST RESULTS ct Na RS versio Firmware /Software version A voltmeter is connected across 1S and 2S and two ammeters, one in series with 1S and 1L and other in series with 2S and 2L... The serial port is connected to the PC via cables for checking parameter values. Pulsar source, LNG reference meter, DSO, Multimete Test Environment Details Test bench Details/Configuration Details STANDARD System Test Cases Expected Result Inference on the acceptability of the results Input Test Values rks (l any) Test Case Scena Description Test Case Designed Fo Test N Test ID Test D Req. ID Output Paramete Lower Limit Data El Input Value UON Jpper Lim uracy Test of KWh 50Hz of test Freque PF Time 20 Т3 do BVA ctive Energ % Erro f test no.5 + 2.1% no.59 -2.1% 1min 0.23% BIP88 276\ Pi Pi Fi hase Voltage 10A 50Hz 0.5lag 1min ase Curren est res Test resul Accuracy Test of KWh тз BVA 21 do Active Energ % Error of test o.59 -39 f test no.5 + 3% me 0.35% CBIP88 276V Phase Voltage Phase Current OK est resu of test no.59 -2.1% Test resu 3UA 50Hz Accuracy Test of KWh Т3 BVA % Error of test no.5 + 2.1% 22 do Active Energ 1min 0.50% 276V 30A 50Hz 0.5lag 1min CBIP88 Phase Voltage Phase Current est res Test resul Accuracy Test of KWh тз of test 10.59 -3% 23 do BVA Active Energ % Error of test no.5 + 3% '⊢ īme -0.45% CBIP88 Phase Voltage Phase Current Frequency 276V OK 60A 50Hz R01,R02, R04,R05, R06,R07, R10,H04, H05,H07, H08,H11 H19 Test resu of test no.5 + 2.1% Test resu of test no.59 -2.1% 24 тз Accuracy Test of KWh BVA % Error do ctive Energy 0.28% 276V 60A 50Hz 0.5lag CBIP88 Phase Voltage Phase Current Erequency R01,R02, R04,R05, R06,R07, R10,H04, H05,H07, Test resu of test no.59 -3% Test result of test no.5 + 3% uracy Test of KWh тз 25 do Frequeries PF Time BVA % Erro H08,H11 -0.13% The system is operated at a voltage which is -10% below the pnominal operating voltage which will be applied between 15 and 25 A this voltage, six different current values are specifier. The ammeter connected to 15 Each of these combinations of Phase current and Phase voltage are measured at 50Hz for eacraryc. PF is varied between 0.5 lag and unly throughout these tests. Under these conditions, the KWh and PF is measured and checked for accuracy as per international Standard specifications. The test will commence when the enter key the is in present threafter narch the norm further the enter key the international present sets will commence when the enter key the international present sets will commence when the enter key the international present sets will commence when the enter key the international present sets will commence when the enter key and the sets the set will commence when the enter key the international present sets will commence when the enter key the international present sets will commence when the enter key the sets the set will be applied to the set will commence when the enter key the sets the set will be applied to the set wi 216V BIP88 hase Voltage S13779 hase Current 500mA R01,R02, R04,R05, R06,R07, R10,H04, H05,H07, H08,H11, H19 Test result of test no.57 + 0.7% 50Hz requency racy Test of KWh of test no.59 -Т2 26 BVA Active Energy % Error 1 Sandard Specifications interest with commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a caliberated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out through the RS232 port. 1min Time 0.10% Phase Voltage Phase Current Frequency PF 216V 500mA 50Hz 0.5lag 1min R01.R02 CBIP88 ок R04,R05, R06,R07, R10,H04, H05,H07, uracy Test o KWh Active Energ 27 Т2 do BVA % Error NA NA 0.55% H08,H11 R01,R02 CBIP88 Phase Voltage 216V οк S13779 Phase Current Frequency PF Time est res of tes Test res Accuracy Test of KWh 1A 50Hz 28 Т2 do BVA Active Ener % Erro f test no.5 + 0.7% no.59 -0.7% 1 1min -0.08% CBIP88 Phase Voltage Phase Current Frequency PF 216V Test resul of test no.5 + 1% 1A 50Hz 0.5lag 1min Accuracy Test of KWh 29 Т2 do BVA Active Energ % Error of test 0.59 -1 P⊦ Time 0.38% 216V CBIP88 hase Voltage hase Curren Test resu of test no.59 -0.7% Test resu 2A 50Hz Accuracy Test of KWh 30 Т2 do BVA Active Energ % Error of test no.5 + 0.7% PF Time 1 1min -0.20% Phase Voltage Phase Current Frequency CBIP88 216V Test result of test no.5 + 1% nase Current requency F Accuracy Test of KWh 50Hz 0.5lag 31 Т2 do BVA Active Energ % Error of test 0.59 -1 -0.33% 216V CBIP88 ок Test resu of test no.59 -0.7% Test resi 50Hz Accuracy Test of KWh Frequency 32 Т2 do BVA Active Energ % Error f test no.5 + 0.7% me 1min 0.38% Phase Voltage Phase Current Frequency PF CBIP88 216V 10A Test result of test no.5 + 1% fest resu of test no.59 -11 Accuracy Test of KWh 33 Т2 do 50Hz 0.5lag BVA Active Energ % Erro ime H05,H07, H08,H11, R01,R02, R04,R05, R06,R07, R10,H04, H05,H07, H08,H11, -0.12% Phase Voltage Phase Current Frequency PF 216V 30A 50Hz CBIP88 οк est resu of test no.59 -0.7% Test resul of test no.5 + 0.7% Accuracy Test of KWh Т2 % Error 34 do BVA Active Energy 1min H08,H11, R01,R02, R04,R05, R06,R07, R10,H04, H05,H07, -0.12% Phase Voltage Phase Current Frequency 216V 30A 50Hz 0.5lag 1min CBIP88 OK Test result of test no.5 + 1% fest resu of test no.59 -11 Accuracy Test of KWh 35 Т2 do requency BVA Active Energ % Error Time H08,H07 H08,H11 R01,R02 R04,R05 R06,R07 -0.359 CBIP88 οк Voltage est resu of test no.59 -0.7% equency 60A 50Hz Test resul of test no.5 + 0.7% Accuracy Test of KWh Т2 36 do BVA Active Energ % Error R10,H04 H05,H07 1 1mi H08,H11 R01,R02 R04,R05 R06,R07 R10,H04 H05,H07 H08,H11 -0.33 216V CBIP88 Phase Voltage Phase Current Frequency PF hase Voltage OK 60A 50Hz 0.5lag Test result of test no.59 + 1% est resu of test no.59 -1 uracy Test of KWh BVA 37 Т2 do Active Energ % Error Time -0.55% The system is operated at a voltage which is +10% above the nominal operating voltage which will be applied between 15 and 25 At this voltage, is utifierent current values are specificity. The for testing which will be adjusted by observing the reading on the ammeter connected to 15. Each of these combinations of Phase current and Phase voltage are measured at 50Hz for accuracy. FF is varied between 0.5 ing and unity throughout these testing the these reading the KWh and 0F test. 264V BIP88 hase Voltage S13779 Phase Current 500mA

50Hz

D1/A

Anti-

% Error

Test result of test

тr

R01,R02 R04,R05 R06,R07 R10 H04

acy Test of

	Project Name				SYS	TEM TEST PLAN	/ TEST RESU									-
	RS version				1.4		0. 2.11 0						Ver2.2			-
Test	Environment D	etails	A voltmet	er is connected acro	ss 1S and 2S and two ammeters, one in series with 1S and 1L a	and other in series with	2S and 2L The	Firmware /Sof Test b				Pulsar sour	ce,LNG reference mete	r,DSO,Multimeter		-
					erial port is connected to the PC via cables for checking parameterial			Details/Configu	uration Details						-	STANDARDS
					System Test Cases	1			1					-		
				Test Case Scenario		Input Test	Values	Test Case		Expected	l Result	-		Inference on the acceptability of the results	Remarks (If any)	
Test No.	Test ID	Test Date	Req. ID	Description		Data Element	Input Values	Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	leading		
			H05,H07,	KWh	measured and checked for accuracy as per International			577	noure energy	70 EII0	no.59 -	+ 0.7%				
			H08,H11, H19		Standard specifications. The test will commence when the ente key is pressed thereafter exactly after one minute the enter key	PF	1				0.7%					
					would be pressed again. During this duration, the EUT and a caliberated meter shall be given the same inputs and their readings will be compared to measure accuracy. The data from	Time	1min									
					the meter will be read-out through the RS232 port.								0.25%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	264V 500mA							ок		CBIP88
39	T2		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.5lag 1min	BVA	Active Energy	% Error	NA	NA				
			H08,H11, R01,R02,			Phase Voltage	264V				T		0.55%	ок		CBIP88
40	T2		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	1A 50Hz 1	BVA	Active Energy	% Error	Test result of test no.59 -	Test result of test no.59				
			H05,H07, H08,H11,			Time	1min				0.7%	+ 0.7%	0.02%			
			R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current	264V 1A 50Hz				Test result	Test result		ок		CBIP88
41	T2		R10,H04, H05,H07,	KWh	do	Frequency PF Time	0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59 + 1%				
			H08,H11, R01,R02, R04,R05,			Phase Voltage	264V				Test seculi		-0.01%	ок		CBIP88
42	T2		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	2A 50Hz 1	BVA	Active Energy	% Error	Test result of test no.59 -	Test result of test no.59			<u> </u>	<u> </u>
			H05,H07, H08,H11,			Time	1min				0.7%	+ 0.7%	-0.05%	0/		00/007
			R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current Frequency	264V 2A 50Hz				Test result	Test result		ок		CBIP88
43	T2		R10,H04, H05,H07,	KWh	do	PF Time	0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59 + 1%				
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	264V 10A				Test result		0.12%	ок		CBIP88
44	T2		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 1	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 + 0.7%				
			H05,H07, H08,H11, R01.R02.			Time Phase Voltage	1min 264V				0.7%	1 0.1 /0	-0.45%	ок		CBIP88
45	T2		R04,R05, R06,R07,	Accuracy Test of		Phase Current Frequency	10A 50Hz	BVA	1. F	A. 5	Test result	Test result		UK .		CDIF00
45	12		R10,H04, H05,H07,	KWh	do	PF Time	0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59 + 1%	0.45%			
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	264V 30A				Test result		-0.15%	ок		CBIP88
46	T2		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 1	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 + 0.7%				
			H05,H07, H08,H11, R01.R02.			Time Phase Voltage	1min 264V				0.7%		-0.22%	ок		CBIP88
47	T2		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	30A 50Hz	BVA	Anti-a France	°	Test result of test	Test result		UN		
47	12		R10,H04, H05,H07, H08,H11,	KWh	do	PF Time	0.5lag 1min	BVA	Active Energy	% Error	no.59 -1%	of test no.59 + 1%	0.33%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	264V 60A				Test result	T	0.33%	ок		CBIP88
48	T2		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	50Hz 1	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 + 0.7%				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 264V				0.7%		-0.25%	ок		CBIP88
49	T2		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	60A 50Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59		-		
			R10,H04, H05,H07, H08,H11,	KWh		Time	0.5lag 1min				no.59 -1%	+ 1%	-0.55%			
						Phase Voltage	240V	•							1	CBIP88
					The system is operated at the nominal operating voltage which will be applied between 1S and 2S.At this voltage,six different		240V 200mA							ок		IS13779
					current values are specified for testing which will be adjusted by obsevring the reading on the ammeter connected to 1S. Each of	,	50Hz									
			R01,R02, R04,R05, R06,R07.		these combinations of Phase current and Phase voltage are measured at 50Hz for accuracy. PF is varied between 0.5 lag, unity and 0.8 lead throughout these tests. Under these		1									
50	T2,T3		R10,H04, H05,H07,	Accuracy Test of KWh	conditions, the KWh is measured and checked for accuracy as per International Standard specifications. The test will	PF	1min	BVA	Active Energy	% Error	-2%	+2%				
			H08,H11, H19		commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During this duration, the EUT and a caliberated meter shall be given	Time										
					the same inputs and their readings will be compared to measure accuracy. The data from the meter will be read-out											
					through the RS232 port.		1						0.000			
			R01,R02,			Phase Voltage Phase Current	240V 500mA						0.88%	ок		CBIP88
51	T2,T3		R04,R05, R06,R07, R10,H04,	Accuracy Test of	do	Frequency PF	50Hz 0.5lag	BVA	Active Energy	% Error	-2%	+2%		-		
			H05,H07, H08,H11,	KWh		Time	1min									
			H19 R01,R02,			Phase Voltage	240V						1.71%	ок		CBIP88
			R04,R05, R06,R07,	Accuracy Test of		Phase Current Frequency PF	500mA 50Hz 0.8 lead									
52	T2,T3		R10,H04, H05,H07, H08,H11,	KWh	do	Time	1min	BVA	Active Energy	% Error	-2%	+2%				
			H19			Phase Voltage	240V						0.88%	ок		CBIP88
			R01,R02, R04,R05, R06,R07,			Phase Voltage Phase Current Frequency	1A 50Hz								L_	ODII:00
53	T2,T3		R10,H04, H05,H07,	Accuracy Test of KWh	do	PF Time	1 1min	BVA	Active Energy	% Error	-1%	1%				
			H08,H11, H19				-						-0.05%		-	
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 1A							ок		CBIP88
54	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1.5%	+1.5%				
			H05,H07, H08,H11, H19													
			.110			Phase Voltage	240V						0.67%	ок		CBIP88
			R01,R02,				1.0									
55	T2 T2		R04,R05, R06,R07,	Accuracy Test of	da	Phase Current Frequency PF	1A 50Hz 0.8 lead	BVA	Active Engra	% Error	-1 6%	+1 6%				
55	T2,T3		R04,R05,	Accuracy Test of KWh	do	Phase Current	1A 50Hz	BVA	Active Energy	% Error	-1.5%	+1.5%				

	Renesas 1	echnology Sin	gapore		sys	TEM TEST PLAN	/ TEST RESU	LTS								
	Project Name						SPEM CI									
	RS version				1.4			Firmware /Soft	tware version				Ver2.2			
Test E	Environment D	etails	A voltmet	er is connected acros se	ss 1S and 2S and two ammeters, one in series with 1S and 1L a arial port is connected to the PC via cables for checking parameters.	and other in series with ter values.	2S and 2L The	Test b Details/Configu				Pulsar sourc	e,LNG reference meter,	DSO,Multimeter		STANDARD
					System Test Cases											
						Input Test V	/alues			Expected	d Result			Inference on the acceptability of the	Remarks (If any)	
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description		Data Element	Input Values	Test Case Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	results	any)	
			R04.R05.			Phase Current	2A		raiameter		Linit					
56	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 1 1min	BVA	Active Energy	% Error	-1%	+1%				
			H05,H07, H08,H11, H19			Time		-								
			R01,R02, R04.R05.			Phase Voltage Phase Current	240V 2A	-					-0.05%	ок		CBIP88
57	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1.5%	+1.5%				
			H05,H07, H08,H11, H19	NWI		Time		-								
			R01,R02,			Phase Voltage Phase Current	240V 2A	-					-0.50%	ок		CBIP88
58	T2,T3		R04,R05, R06,R07, R10.H04.	Accuracy Test of	do	Frequency PF	50Hz 0.8 lead	BVA	Active Energy	% Error	-1.5%	+1.5%				
			H05,H07, H08,H11,	KWh		Time	1min	-								
			H19 R01,R02,			Phase Voltage	240V	1					0.76%	ок		CBIP88
59	T2,T3		R04,R05, R06,R07, R10.H04.	Accuracy Test of	do	Phase Current Frequency PF	10A 50Hz 1	BVA	Active Energy	% Error	-1%	+1%				
55			H05,H07, H08,H11,	KWh		Time	1min				. ,0					
			H19 R01,R02,			Phase Voltage	240V	1					-0.25%	ок		CBIP88
	To T-		R04,R05, R06,R07,	Accuracy Test of		Phase Current Frequency PF	10A 50Hz 0.5 lag	514	A	w =						
60	T2,T3		R10,H04, H05,H07, H08,H11,	KWh	do	Time	1min	BVA	Active Energy	% Error	-1%	+1%				
			H19			Phase Voltage	240V						-0.25%	ок		CBIP88
			R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Current Frequency	10A 50Hz 0.8 lead									
61	T2,T3		R10,H04, H05,H07, H08.H11.	KWh	do	Time	1min	BVA	Active Energy	% Error	-1%	+1%				
			H19			Phase Voltage	240V						-0.02%	ок		CBIP88
			R01,R02, R04,R05, R06.R07.			Phase Current Frequency	30A 50Hz									
62	T2,T3		R10,H04, H05,H07,	Accuracy Test of KWh	do	PF Time	1 1min	BVA	Active Energy	% Error	-1%	+1%				
			H08,H11, H19			Di	0.001						-0.15%	ок		CBIP88
			R01,R02, R04,R05, R06,R07,			Phase Voltage Phase Current Frequency	240V 30A 50Hz	-						OK		CBIF00
63	T2,T3		R10,H04, H05,H07,	Accuracy Test of KWh	do	PF Time	0.5 lag 1min	BVA	Active Energy	% Error	-1%	+1%				
			H08,H11, H19										-0.50%			
			R01,R02, R04,R05,			Phase Voltage Phase Current Frequency	240V 30A 50Hz	-						ок		CBIP88
64	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	PF Time	0.8 lead 1min	BVA	Active Energy	% Error	-1%	+1%				
			H08,H11, H19					-					0.50%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 60A 50Hz							ок		CBIP88
65	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	1 1min	BVA	Active Energy	% Error	-1%	+1%				
			H08,H11, H19					-					-0.32%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 60A						0.0278	ок		CBIP88
66	T2,T3		R06,R07, R10,H04, H05.H07.	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.5 lag 1min	BVA	Active Energy	% Error	-1%	+1%				
			H05,H07, H08,H11, H19					-					-0.73%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 60A	1					0.7070	ок		CBIP88
67	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	50Hz 0.8 lead 1min	BVA	Active Energy	% Error	-1%	+1%				
			H05,H07, H08,H11, H19					-					0.31%			
-					The system is operated at the seminal second se								0.31%			
					The system is operated at the nominal operating voltage which will be applied between 1S and 2S.At this voltage,six different current values are specified for testing which will be adjusted by		240V	-						ок		IS13779
			R01,R02, R04,R05,		obsevring the reading on the ammeter connected to 1S. Each of these combinations of Phase current and Phase voltage are measured at 52.5Hz and 47.5Hz for accuracy. PF is varied	Phase Current	500mA									
68	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	between 0.5 lag and unity throughout these tests. Under these conditions, the KWh is measured and checked for accuracy as		52.5Hz	BVA	Active Energy	% Error	Test result of test no.59 -	Test result of test no.59				
			H05,H07, H08,H11, H19		per International Standard specifications. The test will commence when the enter key is pressed thereafter exactly after one minute the enter key would be pressed again. During	PF	1	-			0.8%	+ 0.8%				
					this duration, the EUT and a caliberated meter shall be given the same inputs and their readings will be compared to	Time	1min	-								
					measure accuracy. The data from the meter will be read-out through the RS232 port.								0.25%			
Ţ	_		R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current Frequency	240V 500mA 52.5Hz	-						ок		IS13779
69	T2,T3		R10,H04, H05,H07,	KWh	do	PF Time	0.5lag 1min	BVA	Active Energy	% Error	NA	NA				
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	240V 500mA				Test result	Test ro//	0.13%	ок		IS13779
70	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	47.5Hz 1	BVA	Active Energy	% Error	of test no.59 - 0.8%	Test result of test no.59 + 0.8%				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 240V				0.0%		0.13%	ок		IS13779
71	T2,T3		R04,R05, R06,R07, R10.H04.	Accuracy Test of KWh	do	Phase Current Frequency PF	500mA 47.5Hz 0.5lag	BVA	Active Energy	% Error	NA	NA				
			H05,H07, H08,H11,	NWII		Time	1min						0.50%			
_			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 1A	1			Test result	T		ок		IS13779
72	T2,T3		R06,R07,	Accuracy Test of	do	Frequency	52.5Hz	BVA	Active Energy	% Error	of test	Test result of test no.59				

	Droig of N'				SYS	TEM TEST PLAN										_
	Project Name RS version				1.4		SPEM C	1					Ver2.2			-
Tort	Environment D) otaile	Avoltmot	ter is connected acro	ss 1S and 2S and two ammeters, one in series with 1S and 1L a	and other in series with	2S and 2L The	Firmware /Sof				Bulear cours	ce,LNG reference meter	DSO Multimeter		
Test	Environment b	Jetalis	A volumen		arial port is connected to the PC via cables for checking parame		125 and 2L The	Test b Details/Configu	ench uration Details			Puisar sourc	e, LING reference meter	,DSO,Multimeter	T	STANDARDS
		· · · · ·			System Test Cases											
				T. 1.0		Input Test	Values			Expected	Result			Inference on the acceptability of the	Remarks (If any)	
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description		Data Element	Input Values	Test Case Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	results	uiy)	
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	240V 1A				Test result	Test result	-0.20%	ок		IS13779
73	T2,T3		R06,R07, R10,H04, H05,H07, H08,H11,	Accuracy Test of KWh	do	Frequency PF Time	52.5Hz 0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59 + 1%	-0.40%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 1A				Test result	Test result	0.40%	ок		IS13779
74	T2,T3		R06,R07, R10,H04, H05,H07, H08,H11,	Accuracy Test of KWh	do	Frequency PF Time	47.5Hz 1 1min	BVA	Active Energy	% Error	of test no.59 - 0.8%	of test no.59 + 0.8%	-0.12%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 1A				Test result	Test result	0.1270	ок		IS13779
75	T2,T3		R06,R07, R10,H04, H05,H07, H08,H11.	Accuracy Test of KWh	do	Frequency PF Time	47.5Hz 0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59	0.25%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 2A				Test result	Test result	0.23 %	ок		IS13779
76	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	52.5Hz 1 1min	BVA	Active Energy	% Error	of test no.59 - 0.8%	of test no.59 + 0.8%				
			H08,H11, R01,R02, R04,R05,			Phase Voltage	240V						-0.20%	ок		IS13779
77	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	2A 52.5Hz 0.5lag	BVA	Active Energy	% Error	Test result of test no.59 -1%	Test result of test no.59 + 1%				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 240V				1/0		-0.10%	ок		IS13779
78	T2,T3		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	2A 47.5Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				
-			R10,H04, H05,H07, H08,H11,	KWh		PF Time	1 1min	-			no.59 - 0.8%	+ 0.8%	-0.15%			
			R01,R02, R04,R05, R06,R07,	Accuracy Test of		Phase Voltage Phase Current	240V 2A 47.5Hz				Test result	Test result		ок		IS13779
79	T2,T3		R10,H04, H05,H07,	KWh	do	Frequency PF Time	0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59 + 1%				
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	240V 10A	-			Test result		0.33%	ок		IS13779
80	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Frequency PF	52.5Hz 1	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59 + 0.8%				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 240V				0.8%	. 0.0 %	-0.45%	ок		IS13779
81	T2.T3		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	10A 52.5Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				1313/18
5.	12,10		R10,H04, H05,H07, H08,H11,	KWh	30	PF Time	0.5lag 1min	570	. Iouvo Energy	70 EIIUI	no.59 -1%	+ 1%	-0.45%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 10A				Test result	Test result	0.40%	ок		IS13779
82	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	47.5Hz 1 1min	BVA	Active Energy	% Error	of test no.59 - 0.8%	of test no.59 + 0.8%				
			H08,H11, R01,R02,			Phase Voltage	240V						-0.33%	ок		IS13779
83	T2,T3		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	10A 47.5Hz 0.5lag	BVA	Active Energy	% Error	Test result of test	of test no.59				
			H05,H07, H08,H11, R01,R02,			Time	1min				no.59 -1%	+ 1%	0.15%	ок		IS13779
84	T2,T3		R04,R05, R06,R07,	Accuracy Test of	do	Phase Voltage Phase Current Frequency	240V 30A 52.5Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				1313/79
04	12,15		R10,H04, H05,H07, H08.H11.	KWh	40	PF Time	1 1min		Active Energy	76 Ellor	no.59 - 0.8%	+ 0.8%	-0.32%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 30A				Test result	Test result	-0.32 //	ок		IS13779
85	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	52.5Hz 0.5lag 1min	BVA	Active Energy	% Error	of test no.59 -1%	of test no.59				
			H08,H11, R01,R02, R04,R05,			Phase Voltage	240V 30A	-			Test result		-0.15%	ок		IS13779
86	T2,T3		R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	47.5Hz	BVA	Active Energy	% Error	of test no.59 -	Test result of test no.59				
			H05,H07, H08,H11, R01,R02,			Time Phase Voltage	1min 240V	-			0.8%	+ 0.8%	-0.20%	ок	-	IS13779
87	T2,T3		R04,R05, R06,R07,	Accuracy Test of	do	Phase Current Frequency	30A 47.5Hz	BVA	Active Energy	% Error	Test result of test	Test result of test no.59				1313/18
5,	12,10		R10,H04, H05,H07, H08.H11.	KWh	40	PF Time	0.5lag 1min	507	nouve Energy	70 End	no.59 -1%	+ 1%	0.35%			
			R01,R02, R04,R05,			Phase Voltage Phase Current	240V 60A				Test result	Test result		ок		IS13779
88	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	52.5Hz 1 1min	BVA	Active Energy	% Error	of test no.59 - 0.8%	of test no.59 + 0.8%				
			H08,H11, R01,R02,			Phase Voltage	240V						-0.32%	ок		IS13779
89	T2,T3		R04,R05, R06,R07, R10,H04,	Accuracy Test of KWh	do	Phase Current Frequency PF	60A 52.5Hz 0.5lag	BVA	Active Energy	% Error		of test no.59				
			H05,H07, H08,H11,			Time	1min				no.59 -1%	+ 1%	-0.33%	OK		IS13779
90	T2,T3		R01,R02, R04,R05, R06,R07,	Accuracy Test of	-	Phase Voltage Phase Current Frequency	240V 60A 47.5Hz	BVA	Active Free	% E	Test result of test	restresuit		ок		1313/19
90	12,13		R10,H04, H05,H07,	KWh	do	PF Time	1 1min	DVA	Active Energy	% Error	no.59 - 0.8%	of test no.59 + 0.8%	-0.35%			
			H08,H11, R01,R02, R04,R05,			Phase Voltage Phase Current	240V 60A				Test result	Test result	-0.33%	ок	L	IS13779
91	T2,T3		R06,R07, R10,H04, H05,H07,	Accuracy Test of KWh	do	Frequency PF Time	47.5Hz 0.5lag 1min	BVA	Active Energy	% Error		of test no.59			-	
			H08,H11,										0.01%			
				Accuracy Test of	The system will be operated at nominal voltage and nominal current. The operating frequency will be maintained at 50Hz	Phase Voltage Phase Current Frequency	240V 0.5A 50Hz	-						ок		IEC62053-21
92	Т6		R03,R19	RMS Current	throughout this test. Only the power factor will be varied and wi be observed over a duration of one minute.	PF	0.5lag	BVA	AMPERE	A	0.49	0.51	0.504			
						Phase Voltage Phase Current	240V	-						ок		IEC62053-21
93	Т6		R03,R19	Accuracy Test of RMS Current	do	Phase Current Frequency PF	0.5A 50Hz 1	sv	AMPERE	A	0.49	0.51	0.502			
						Phase Voltage	240V							ок		IEC62053-21
94	T6		R03,R19	Accuracy Test of	do	Phase Voltage Phase Current Frequency	0.5A 50Hz	BVA	AMPERE	A	0.49	0.51	0.508			52000-21
				RMS Current		PF	0.8lead		m LIVL		5.48	5.51	0.000			
																IEC62053-21

	Renesas T	fechnology Si	ingapore			TEM TEST DI AN										1
	Project Name				515	TEM TEST PLAN	SPEM C									-
Test I	RS version)etails	A voltme		1.4 ss 1S and 2S and two ammeters, one in series with 1S and 1L a erial port is connected to the PC via cables for checking paramet		2S and 2L The	Firmware /Soft Test b Details/Configu	ench			Pulsar sou	Ver2.2	,DSO,Multimeter		STANDARDS
		1	1	1	System Test Cases			1								
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario		Input Test V	/alues	Test Case		Expected	Result	1	Actual Result	Inference on the acceptability of the results	Remarks (If any)	
				Description		Data Element	Input Values	Designed For	Output Parameter	UOM	Lower Limit	Upper Limit				
95	T7		R03,R19	Accuracy Test of RMS Current	do	Frequency PF	50Hz 0.5lag	BVA	AMPERE	А	3.92	4.08	3.98			
						Phase Voltage	240V 4A							ок		IEC62053-21
96	Τ7		R03,R19	Accuracy Test of RMS Current	do	Phase Current Frequency PF	4A 50Hz 1	sv	AMPERE	А	3.92	4.08	3.97			
						Phase Voltage	240V	-						ок		IEC62053-21
97	Τ7		R03,R19	Accuracy Test of RMS Current	do	Phase Current Frequency PF	4A 50Hz 0.8lead	BVA	AMPERE	А	3.92	4.08	4.01			
						Phase Voltage	240V	-						ок		IEC62053-21
98	Т8		R03,R19	Accuracy Test of RMS Current	do	Phase Current Frequency PF	10A 50Hz 0.5lag	BVA	AMPERE	А	9.8	10.2	10.03			
				Tuilo Guitait		Phase Voltage	240V	-						ок		IEC62053-21
99	T8		R03,R19	Accuracy Test of	do	Phase Voltage Phase Current Frequency	10A 50Hz	sv	AMPERE	A	9.8	10.2	10.1			IEC62053-21
				RMS Current		PF	1	-								
100	Т8		R03,R19	Accuracy Test of	do	Phase Voltage Phase Current Frequency	240V 10A 50Hz	BVA	AMPERE	A	9.8	10.2	10.04	ок		IEC62053-21
100	10		100,1010	RMS Current	40	PF	0.8lead	DVA.	AWFERE	~	5.0	10.2	10.04			
				Accuracy Test of		Phase Voltage Phase Current Frequency	240V 60A 50Hz	-						ок		IEC62053-21
101	Т9		R03,R19	RMS Current	do	PF	0.5lag	BVA	AMPERE	A	58.8	61.2	59.99			
						Phase Voltage Phase Current	240V 60A							ок		IEC62053-21
102	Т9		R03,R19	Accuracy Test of RMS Current	do	PF PF	50Hz 1	sv	AMPERE	A	58.8	61.2	60.2			
						Phase Voltage Phase Current	240V 60A	-						ок		IEC62053-21
103	Т9		R03,R19	Accuracy Test of RMS Current	do	Frequency PF	50Hz 0.8lead	BVA	AMPERE	A	58.8	61.2	59.97			
					The System will be operated at nominal voltage and nominal current and the display sequence will be checked. The display	Up Scroll key	Realeased									
					shall scroll through the specified sequence for every 10 sec and repeat after the last parameter of the sequence has been displayed. The sequence of the parameters is as follows:	Down Scoll Key	Released	-						ок		
					1. Cumulative Active Energy of tariff 1. 2. Cumulative Active Energy of tariff 2. 3.	MD reset key	Released	-	The display							
					Cumulative Active Energy of tariff 3. 4. Cumulative Active Energy of tariff 4. 5. Cumulative Apparent Energy of tariff 1	MD Teset key	Released	-	will be checked if the sequence of							
104	T21		R21,H13	Test for Autoscroll	6. Cumulative Apparent Energy of tariff 2 7. Cumulative Apparent Energy of tariff 3 8 Cumulative Apparent Energy of tariff 4 9.			IOD	parameters is in accordance with the		NA	NA	Tested Ok.			
					Total Cumulative Energy (resolution 1 decimal points) 10. Instantaneous Power Factor. 11. Maximum Demand (resolution 3 decimal points)	Display	ON	-	sequence specified.							
					Please refer to REN0144UG01 (User Guide) for further details.	Time	5Min									
							-		_					01		
105	T12		R14,R21, UI01	Test of Scrolling Keys,MD reset.	Several combinations of these keys will be pressed to validate the proper operation of the system without letting the system to enter into any invalid state of operation.	MD reset key	Released Released	IOD	The display will be checked		NA	NA	Tested Ok.	UK		
106	T13		R14,R21,	<-do->	do	Display Up Scroll key Down Scoll Key	ON Released Depressed	IOD	whether the The display will be		NA	NA	Tested Ok.			
100	115		UI01	~~~~~		MD reset key Display Up Scroll key	Released ON Released	100	checked whether the The back-up		NA.	110	Tested OK.	ок		
107	T14		R14,R21, UI01	<-do->	Press the MD Reset key. Then MD value from the EEPROM wil be read-out through the RS232 port and verified.	Down Scoll Key MD reset key Display	Released Depressed ON	IOD	of the present MD value will be stored in		NA	NA	Tested Ok.			
						Time Up Scroll key	2sec Released		the EEPROM The specified					ок		
108	T15		R14,R21, UI01	<-do->	Several combinations of these keys will be pressed to validate the proper operation of the system without letting the system to enter into any invalid state of operation.	Display	Released Released ON	IOD	keys will not perform any of their assigned		NA	NA	Tested Ok.			
			R14,R21,			Time Up Scroll key Down Scoll Key	2sec Depressed Depressed		task and the The specified keys will not	<u> </u>			_	ок		
109	T16		UI01	<-do->	do	MD reset key Display Time	Depressed ON 2sec	IOD	perform any of their assigned task and the		NA	NA	Tested Ok.			
110	T16		R14,R21,	<-do->	do	Up Scroll key Down Scoll Key MD reset key	Depressed Depressed Released	IOD	The specified keys will not perform any of		NA	NA	Tested Ok.	ок		<u> </u>
	-		UI01			Display Time	ON 2sec	1	their assigned task and the The specified			· ·		ок		
111	T16		R14,R21, UI01	<-do->	do	Up Scroll key Down Scoll Key MD reset key	Depressed Released Depressed	IOD	keys will not perform any of		NA	NA	Tested Ok.			
\vdash						Display Time Up Scroll key	ON 2sec Released	1	their assigned task and the The specified					ок		
112	T16		R14,R21, UI01	<-do->	do	Down Scoll Key MD reset key Display	Depressed Depressed ON	IOD	keys will not perform any of their assigned		NA	NA	Tested Ok.			<u> </u>
			DATES			Time Up Scroll key Down Scoll Key	2sec Depressed Released	-	task and the The specified keys will not					ок	-	
113	T16		R14,R21, UI01	<-do->	do	MD reset key Display Time	ON 2sec	IOD	perform any of their assigned task and the		NA	NA	Tested Ok.			
114	T16		R14,R21,	<-do->	do	Up Scroll key Down Scoll Key MD reset key	Released Depressed Depressed	IOD	The specified keys will not perform any of		NA	NA	Tested Ok.	ок		
			UI01			Display Time	ON 2sec	1	their assigned task and the							-
			R25,R10,	Test of functionality	Transmit the header of the frame for the protocol followed, to th energy meter via the optical port. In response to this, the acknowledgement transmitted by the enerymeter shall be	Data transmitted to energymeter Phase Voltage	Header (/?!\x0d\x0a) 240V		Data received shall match with the					ок		
115	T17		R26,H11	of RS232 Optical port	compared with the "acknowledgement format" as specified in the protocol.(REN0144SCP01 "Serial Communication Procedure")			IOD	specified acknowledge ment format.		NA	NA	Tested OK.			
			H09,H21,	LED Indication and	The system shall be operated at the nominal operating voltage	Phase Voltage Phase Current	240V 0.04A		The KWh LED shall					ок		
116	T18		H23,R13, R12,R08	Fault Indication Tests	which will be applied between 1S and 2S.Starting current shall be fed to the system.	Neutral Current Frequency PF	0.04A 50Hz 1	IOD	blink at a rate proportional to the power		NA	NA	Tested OK.			
			H00 H21			Time Phase Voltage Phase Current	1min 240V 10A(reverse		consumed					ок		
. 1		•	. нач Н91	•				-				•	•			

		echnology Si	ngapore		SYS	TEM TEST PLA]
	Project Name RS version				1.4		SPEM C			1			Ver2.2			-
Test	Environment D	etails	A voltme		oss 1S and 2S and two ammeters, one in series with 1S and 1L a verial port is connected to the PC via cables for checking parame		ith 2S and 2L The	Firmware /Sof Test to Details/Configu	ench			Pulsar sour	ce,LNG reference meter,	DSO,Multimeter		-
				-	System Test Cases			Details/Conlig	aration Details							STANDARDS
				Test Case Scenario		Input Te	st Values	Test Case		Expected	Result			Inference on the acceptability of the	Remarks (If any)	-
Test No.	Test ID	Test Date	Req. ID	Description		Data Element	Input Values	Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	results		
117	T19		H23,R13, R12,R08	Current reversal indication	The Phase current is made to flow in opposite direction.ie.1L to 1S. Nominal phase voltage shall be applied to the system.	Neutral Current Frequency	10A(reverse 50Hz 1	EB,IOD	Reversal LED		NA	NA	Tested OK.			
						Time Phase Voltage Phase Current	1min 240V	-						ок		
118	T20		H09,H21, H23,R13, R12,R08	Earth Leakage indication	The neutral current connection will be removed (2L) and the load will be connected to earth (1L).	Frequency	10A 0A 50Hz	EB,IOD	ELT LED		NA	NA	Tested OK.			
						Time	1min Connected to	-								
			R12,R13,		The meter shall operate at nominal voltage and current.During	Incoming Phase	incoming neutral Connected to	-	The meter					ок		
119	T22		H20,H21, H22,H23	Anti-Tampering and Anti-Fraud Testing	I these tests, the various methods of tampering will be simulated on the meter and simultaneously the meter functionality will be tested for proper operation.		Connected to incoming Phase Connected	EB	should be operational.				The meter is operational			
						Outgoing Phase Outgoing Neutral Phase Voltage	Connected 240V	-								
						Phase Current Incoming Phase Incoming Neutral	10A Connected Disconnected	-						ок		
120	T23		R12,R13, H20,H21, H22,H23	<-do->	do	Outgoing Phase Outgoing Neutral	Connected to earth via load earthed	EB	The meter should not be powered ON.				The meter is not powered ON.			
						Phase Voltage Phase Current Incoming Phase	240V 1A Connected							ок		
121	T23		R12,R13, H20,H21,	<-do->	do	Outgoing Phase	Disconnected Connected to earth via load	EB	The meter should not be				The meter is not powered ON.			
			H22,H23			Outgoing Neutral Phase Voltage Phase Current	earthed 240V 2A	-	powered ON.							
100	700		R12,R13,			Incoming Phase Incoming Neutral Outgoing Phase	Connected Disconnected Connected to	-	The meter should be				The meter is operational powered			
122	T23		H20,H21, H22,H23	<-do->	do	Outgoing Neutral Phase Voltage	earth via load earthed 240V	EB	operational, powerd up by the third CT.				up by the neutral missing CT			
						Phase Current Incoming Phase Incoming Neutral	3A Connected Connected							ок		
123	T24		R12,R13, H20,H21,	<-do->	do	Outgoing Phase	Connected to earth via load Connected to	EB	The meter should be				The meter is operational			
			H22,H23			Outgoing Neutral Phase Voltage	earth via resistor 240V		operational.							
			R12.R13.			Phase Current Incoming Phase Incoming Neutral	10A Connected Disconnected		The sector					ок		
124	T25		R12,R13, H20,H21, H22,H23	<-do->	do	Outgoing Phase Outgoing Neutral	Connected to earth via load Disconnected	EB	The meter should not be powered ON.				The meter is not powered ON.			
						Phase Voltage Phase Current Incoming Phase	240V 1A Connected	-						ок		
125	T25		R12,R13, H20,H21, H22,H23	<-do->	do	Incoming Neutral Outgoing Phase	Disconnected Connected to earth via load	ЕВ	The meter should not be				The meter is not powered ON.			
			H22,H23			Outgoing Neutral Phase Voltage Phase Current	Disconnected 240V 2A	-	powered ON.					ок		-
126	T25		R12,R13, H20.H21.	<-do->	do	Incoming Phase Incoming Neutral Outgoing Phase	Connected Disconnected Connected to earth via load	ЕВ	The meter should be				The meter is operational powered			
120	125		H22,H23	~~~~~~	00	Outgoing Neutral Phase Voltage Phase Current	Disconnected 240V 3A		powerd up by the third CT.				up by the neutral missing CT			
							Connected to									
			R10,R11,			Incoming Phase	outgoing Phase		The meter should be operational				The meter is	ок		
127	T26		H19,H20, H21,H22	<-do->	do	Incoming Neutral Outgoing Phase	Connected Connected to incoming	EB	and the "Reversal" LED shall				operational and REV led glows.			
						Outgoing Neutral Phase Voltage Phase Current	Phase Connected 240V 10A	-	glow.							-
128			R10,R11, H19,H20,	Meter Bypass Test	The meter shall be bypassed using a low resistance wire	Incoming Phase	Connected	EB	The meter should be operational				The test could not be	ок		This goes to show that th meter is
			H21,H22		between 1S and 1L.	Incoming Neutral Outgoing Phase Outgoing Neutral	Connected Connected Connected		and the "ELT" LED shall glow.				simulated.			difficult to be tampered.
						Phase Voltage Phase Current Impulse Voltage	240V 10A 6KV	-						ок		
129			H06	Impulse voltage tes				-	Functionality				The system is stable and no malfunctioning			CBIP88
					electric circuits relative to earth. This shall be only a functional test.			-					after test.			-
						Test Voltage R.M.S	3.: 4KV	-						ок		
					For Protective Class 1 Meters:Points of application of test voltage: a.) Between: On one hand, all the current and voltage circuits			-								IEC62052-11
130			H06	AC Voltage Test	as well as the auxiliary circuits whose reference voltage is over 40V, connected together and on the other hand, earth. b.) Between circuits not intended to be connected together in			-	Insulation				The test is successful			IEC62053-21 CBIP88 IS13779
					service. The test voltage shall be substantially sinusoidal, having a frequency between 45Hz and 65Hz and applied for 1 min.											
131			H06	Meter Constant	The relation between the test output and the indication on the				Conformity				Not performed		The enclsoure	IEC62052-11 IEC62053-21
131			1100	moter Constant	display shall comply with the marking on the nameplate.				contractiv				performed		should contain the following	CBIP88 IS13779
132			H06	Test of no-load	The current circuit must be open circuit and a voltage of 115 % of Un shall be applied to the voltage circuit. The test output of the meter shall not produce more than one output pulse	Phase Voltage Time	276V 3 Hr						The test is successful	ок	details	IEC62052-11 IEC62053-21
.32				condition	count. The minimum test period will be Dt ³ (600 X 106)/(k X m X Un X Imax) min where k = number of pulses emitted by the output device of the meter			-					tox to succession			CBIP88 IS13779
133			H06	Test of power consumption	The active and apparent power consumption in each voltage circuit of a meter at sinusoidal reference voltage (240V +1%), reference temperature (27°C+2%), reference frequency (50H:	Frequency	240V 50Hz						The test is successful	ок		CBIP88 IS13779
				consumption	+0.3%) and zero magnetic induction shall not exceed 1.5W and 8VA and for each current circuit at Ib shall not exceed	Voltage Variation	+10% of Un							ок		.513/18
		I	I	I.	I	Power Factor	1	J	1			I	I			J

Renesas	Technology Singapore	

	Desis 111				SYS	TEM TEST PLAN										
	Project Name RS version				1.4		SPEM CI	.ass1.0					Ver2.2			
	Environment D	otails	A voltmet	ter is connected acro	1.4 ss 1S and 2S and two ammeters, one in series with 1S and 1L a	ind other in series with	2S and 2L The	Firmware /Soft				Pulsar sour	ver2.2 ce,LNG reference meter,	DSO Multimeter		
		cuito	, volume	SI SI	arial port is connected to the PC via cables for checking paramet	ter values.	20 010 22 110	Test b Details/Configu	ench Iration Details					Boo, Mananeter	1	STANDARD
r					System Test Cases									-		
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario		Input Test	Values	Test Case		Expected	Result	-	Actual Result	Inference on the acceptability of the results	Remarks (If any)	
Test NO.	Teat ID	reat Date	Neq. ID	Description		Data Element	Input Values	Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Nesult			
					Voltage Range: The additional percentage error due to the	Limits of Variation in Percentage error	0.70%									
134			H06	Test of influence of supply voltage	change of influence quantities with respect to the reference quantities shall not exceed the limits given below.								The test is performed successfully with results as mentioned			CBIP88 IS13779
				adphy voltage									above.			1313/73
						Voltage Variation Power Factor	+10% of Un 0.5lag						The test is performed	ок		
135			H06	<-do->	do	Deceedance over	1.00%						successfully with results as mentioned above.			CBIP88 IS13779
						Voltage Variation	-20% to -10%									
136			H06	<-do->	do	-	of Un						The test is performed successfully with			CBIP88
130			HUG	<-uu->	u	Power Factor Limits of Variation in	1						results as mentioned above.	ок		IS13779
						Percentage error	2.10%									
						Voltage Variation	-20% to -10%									
						voltage variation	of Un						The test is performed successfully with			CBIP88
137			H06	<-do->	do	Power Factor Limits of Variation in	0.5lag						results as mentioned above.	ок		IS13779
						Percentage error	3.00%									
							+10% to +15%									
						Voltage Variation	of Un						The test is performed			CBIP88
138			H06	<-do->	do	Power Factor	1						successfully with results as mentioned above.	ок		IS13779
						Limits of Variation in Percentage error	2.10%									
						Voltage Variation	+10% to +15% of Un						The test is performed			
139			H06	<-do->	do	Power Factor	0.5lag						successfully with results as mentioned	ок		CBIP88 IS13779
						Limits of Variation in Percentage error	3.00%						above.			
						Voltage Variation	-20% to -30% of Un						The test is performed			
140			H06	<-do->	do	Power Factor	1						successfully with results as mentioned	ov/		CBIP88 IS13779
						Limits of Variation in Percentage error	+10% to - 100%						above.			
					For testing, MD display will be used. The voltage dips and short interruptions shall not produce a change in the register of more		100% 1s 3						The test is performed	ок		
141			H06	Voltage Dips and short Interruptions	than 0.01 KWh.When the voltage is restored, there shall not have suffered degradation of its meteorological characteristics. Test Conditions:- Voltage circuit energized by reference voltage	Restoring time	50ms						successfully with results as mentioned above.			CBIP88
					No current in current circuits								above.			
						Voltage interruptions interruption time	100% 20 ms							ок	<u> </u>	
142			H06	do	do	number of interruptions	1	ЕВ					The test is performed successfully with results as mentioned			CBIP88
						Restoring time between interruptions							above.			
						Volines Street 2										
143			Line	44	-	Voltage interruptions Dip time	50% 1 min	- 0					The test is performed successfully with	ок		CBIP88
143			H06	do	do	Number of dips	1	EB					results as mentioned above.		<u> </u>	CBIP88
						Basic Current	10A		overcurrent					ок		
					After the application of the short-time overcurrent with the voltage maintained at the terminals, the meter shall be allowed	Power Factor Limits of Variation in	1		shall not damage the meter. The				The test is performed			
144			H06	Test of influence of short-time over- currents	to return to the initial temperature with the voltage circuits energized for one hour individually. The meter shall be able to	Percentage error	1.3070	EB	meter shall perform				successfully with results as mentioned			IS13779
					carry a short-time overcurrent of 30 times Imax for one half cycle at rated frequency				correctly, when back to its initial				above.			1
						D hara 11 11			working							
					After the voltage circuits of the meter have been energized at nominal voltage and meters without any current in the current	Phase Voltage Phase Current	240V 10A		shall perform correctly, when back to					ок		
145			H06	Test of influence of self-heating	circuits for at least 2 hours, the rated maximum current shall be applied to the current circuits. The meter error shall be measured at unity power-factor and at 0.5 lag immediately after	Power Factor Limits of Variation in	1 0.70%	EB	its initial working	Test result of test no.59 -	Test result of test no.59 +		The test is performed successfully with results as mentioned			IS13779
					the current is applied and then at intervals short enough to allow a correct drawing to be made of the curve of error variation as a				conditions and the variation of	0.7%	0.7%		above.			
					function of time.				error shall not			0.25%				
						Phase Voltage Phase Current	240V 10A		shall perform correctly,	Test result	Test result		The test is performed	ок		
146			H06	<-do->	do	Power Factor Limits of Variation in Percentage error	0.5lag 1%	EB	when back to its initial working	of test no.59 -1%	of test no.59 +1%	0.6%	successfully with results as mentioned above.			IS13779

		fechnology Si	i.		SYS	TEM TEST PLAN										
	Project Name						SPEM CI	Lass1.0								
	RS version				1.4			Firmware /Sof	ware version				Ver2.2			
Test	Environment D)etails	A voltme		ss 1S and 2S and two ammeters, one in series with 1S and 1L a arial port is connected to the PC via cables for checking parameters.		2S and 2L The	Test b Details/Configu				Pulsar sour	ce,LNG reference meter,	DSO,Multimeter		STANDARD
					System Test Cases											
						Input Test V	alues/			Expected	d Result			Inference on the acceptability of the	Remarks (If	
Test No.	Test ID	Test Date	Req. ID	Test Case Scenario Description		Data Element	Input Values	Test Case Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	results	any)	
						Test Voltage on the current and voltage	4K(Common Mode)		During the							
147			H06	Fast Transient Burst Test		circuit Duration	60s at each polarity	ЕВ	test a temporary degradation or loss of function or				Test performed successfully with no malfunction.	ок		CBIP88
						Cable length between Limits of Variation in Percentage error	1m 4%	-	performance is acceptable.							-
						Frequency Band:	80MHz to 2000MHz		The application of RF field shall				Test performed successfully with no	ок		
				Test of immunity to	Test with current:Unmodulated Test Field Strength:	Cable length exposed to the field:	1m		not produce a change in the				malfunction.			15000050
148			H06	electromagnetic RF fields	10V/mDuring the test, the behavior of the equipment shall not be perturbed and the variation of error shall be within 2%.b.) Test without any current:Unmodulated Test Field Strength:	Test Field Strength	10V/m	EB	register of more than				E:\cmm\software\			IEC62052- IEC62053-
					30V/m				0.01 KWh and the test				tcases\report\REN2			-
									output shall not produce a							
						Frequency Band:	80MHz to 2000MHz	-	The application of RF field shall					ок		-
149			H06	<-do->	<-do->	Cable length exposed to the field:	1m	EB	not produce a change in the				Test performed successfully with no			IEC62052-
						Test Field Strength	30V/m		register of more than				malfunction.			IEC62053-
									0.01 KWh and the test							
						Test voltage:	8KV		application of the					ок		
					Meter in operating condition- Voltage circuit energized with reference voltage (Un)- Without any current in the current	Test severity level: Number of	4	-	electrostatic discharge the							-
150			H06	Test of immunity to electrostatic	circuits and the current circuit shall be open circuit The application of the electrostatic discharge test voltage shall not produce a change in the register of more than 0.01 KWh and	discharges: Type of Discharge	Contact	EB	meter shall show no				Not Performed (depends on the type			CBIP88
				discharge	the test output shall not produce a signal equivalent to more than 0.01 KWh. Meter in non-operating condition- Voltage and			-	damage or change of				of enclosure)			-
					current circuit shall be unenergized				information and shall stay							
					The test will be carried out according to CISPR22, under the				within the accuracy The test							
				Radio Interference	following conditions:- For Class B equipment- Tested as table- top equipment- For connection to the voltage circuits, an				results shall comply with				Test performed	ок		IEC62052-
151			H06	Measurement	unshielded cable length of 1m to each connector shall be used. Voltage circuits energized with reference voltage (Un)- With a			EB	the requirements				successfully with no malfunction.			IEC62052-
					current between 0.1lb and 0.2lb respectively. (Connected by unshielded cable length of 1m)			-	given in CISPR22.							-
				Surge Immunity	Cable length between Surge generator and EUT: 1mPhase			-	The application of the surge				Test performed	ок		IEC62052-
152			H06	Test	angle: pulses to be applied at 60 deg. and 240deg. after zero- crossing of ACTest voltage: 4KV Generator impedance: 2W			EB	the surge immunity test voltage shall				successfully with no malfunction.			IEC62052-
						Phase Voltage	240V		not produce a Verify whether					ок		-
153	T27		R11,R14,	MD test	The meter shall operate at a phase voltage of 240V and a Phase current of 10A and unity PF. Initially, a MD reset shall be	Phase Current	10A 1	sv	the corresponding	кw	2.376	2.424	2.418			
100	121		UI01	mb tot	done then the meter is operated for 30min at the same operating condition.	Time	30min		KW value is stored in MD		2.070	2.424	2.410			
						Phase Voltage Phase Current	240V 20A	-	register. The					ок		
154	T28		R11,R14, UI01	<-do->	The meter shall now be operated at a relatively higher KW. The MD register shall be updated at the end of this test duration.		1 30min	sv	corresponding KW value is overwritten	кw	4.752	4.848	4.785			
									the previous value in MD							
						Phase Voltage Phase Current	240V 10A		The MD register shall					ок		
155	T29		R11,R14, UI01	<-do->	The meter shall now be operated at a relatively lower KW. The MD register shall not be updated at the end of this test duration	Power Factor Time	1 30min	sv	retain its previous MD	KW	4.752	4.848	4.805			
						Phase Voltage	0.1017	-	value without being							
			R11.R14.		The meter shall operate at a Phase current of 240V and a Phase current of 10A and unity PF. Initially, a MD reset shall be	Phase Current	240V 10A 1	-	Verify whether the corresponding					ок		-
156	T27		UI01	MD test	done then the meter is operated for 60min at the same operating condition.	Time	60min	sv	KW value is stored in MD	KW	2.376	2.424	2.386			
						Phase Voltage	240V		register. The					ок		
157	T28		R11,R14,	<-do->	The meter shall now be operated at a relatively higher KW. The	Phase Current	20A 1	sv	corresponding KW value is	ĸw	4.752	4.848	4.805			-
157	120		UI01	~~~~~	MD register shall be updated at the end of this test duration.	Time	60min	37	overwritten the previous	i.w	4.732	4.040	4.005			
						Phase Voltage	240V		value in MD The MD					ок		
158	T29		R11,R14, UI01	<-do->	The meter shall now be operated at a relatively lower KW. The MD register shall not be updated at the end of this test duration	Prover Factor	10A 1 60min	sv	register shall retain its previous MD	кw	4.752	4.848	4.763			<u> </u>
			0101		After each of the above tests, the		60min	1	value without being							1
						Phase Voltage	240V		ooliiy		1	1		ок		
						Phase Current	10A	1								
				B	The power supply to the energymeter is switched off. The value of all the energies are paired before the commencement of this	Power Factor	1	-	The back-up of	data will be	read from t	he EEPROM				
159			R22	Power-Failure Interrupt	of all the energies are noted before the commencement of this test to be compared with the data after the power is switched ON again with no current.			sv	and shall be f	ound equal power f	I to the value	es before the	Tested OK.			
					or again with to carrent.			-								
								-								
					The RTC will be programmed to a suitable time very near to a		240V							ок		
160			R15	Monthly Auto Reset	month change-over. At the instant the month change-over occurs a a back-up of the following parameters are taken in the	Phase Current	10A 1	sv	The values of of RESET sha	the specifie	ed paramete	ers at the time	Tested OK.			
					EEPROM:(1) Cumulative Active & Apparent Energy (2) Maximum Demand in KW. (3) Date and Time from RTC (4)					data collec	tion mode.	- Parcel and	. soles on.			
					Type of Reset (5) Total Cumulative active energy	Phase Voltage	240V							ок		<u> </u>
161			R17,R10	Tariff update test	The meter shall be operated at the nominal voltage and curren during the entire period of a specified tariff. During this period the energy consumed shall be updated in the respective tariff ti	PF	10A 1 50Hz	sv	The LCD disp	plays the re	espective tar	riff energies.	Tested OK.			1
					the energy consumed shall be updated in the respective tariff to the end of slot.	, requeilty	JUFIZ	1		-	-					1
						Phase Voltage Phase Current	240V 10A							ок		1
			D40 5 **	Desc.		PF Frequency	1 50Hz	1								1
		1	R10, R17, R24, R25	Programming parameters	Refer F716for programming various parameters			sv	The resu	ilt should a:	s per the do	cument	Tested OK.			
162						1		1	1				1	1	1	1
162																
162						Phase Voltage	240V							ок		
162				Manual scrolling to	Press the up or down key to swich the meter to maual scrolling	Phase Current PF	240V 10A 1 50Hz	-						ок		

					SYS	TEM TEST PLAN	/ TEST RESU	LTS								
	Project Name						SPEM CI	Lass1.0								
	RS version				1.4			Firmware /Soft	ware version				Ver2.2			
Test E	Environment D	etails	A voltme		s 1S and 2S and two ammeters, one in series with 1S and 1L a rial port is connected to the PC via cables for checking parameters.		2S and 2L The	Test b Details/Configu				Pulsar sour	ce,LNG reference meter,	DSO,Multimeter		STANDARD
					System Test Cases											
	tt No. Test ID Test Date				Input Test	Values			Expecte	d Result			Inference on the acceptability of the	Remarks (If any)		
Test No.		Test Date	Req. ID	Test Case Scenario Description		Data Element	Input Values	Test Case Designed For	Output Parameter	UOM	Lower Limit	Upper Limit	Actual Result	results	ally)	
				add boronnig	scrolling mode.											