SIGNAL DIRECTORATE
RESARCH DESIGN & STANDARDS ORGNIZATION
LUCKNOW - 226011

Firm's Name:
Sl. No. of Sample:

S.No.	Name of test	Clause no.		Parameter	Specified value	Observed value	OK/ Not OK
1.	Visual inspection, and Dimensional check.	**Cl. 4.7**	i to iii	Components on the monitoring card module	Following components shall be provided on each monitoring card of the system: 1. Standby Fuses. 2. LED indications for Main and Standby Fuses monitored by the card. 3. RESET push button (one for each monitoring card)		
		Cl 5.1	5.1.2	Components and PCB used in design of system (Shall conform to clause 5.1 and 5.2 of RDSO/SPN/144/2006)	(a) ICs and other components used in the equipment shall be of such grade that these can work satisfactorily in -40 deg to +85 deg C temperature range. (b) Capacitors used should be certified for at least +105 deg. C. (c) Discrete components like diodes, transistors, SCRs etc. should conform to industrial grade. (d) PCB should be FR4 or better. (Undertaking from manufacturer)		
					(e) The box should be metallic.		
			5.1.3	Make and diameter of indication LEDs in system	Nichia, Avago, Osram, Cree or Kwality (India) make of 3 mm dia. (Undertaking from manufacturer)		
		Cl. 7.2		Marking on Input and other Terminals	Input terminal, supply, ground and fuse input labels shall be clearly marked on monitoring card as well supply voltage should be clearly mentioned nearby at the input terminals.		
		Cl. 7.3		Marking of words "Indian Railway Property" on the Unit	Engraved /embossed/ screen printed on every unit in letters of 5 mm size (minimum) .		

		Cl. 7.4		Marking on name plate/Screen printing on the Unit	Manufacturer name or trademark		
					Serial number of the unit		
					RDSO's specification number		
					Operating voltage		
					Month and year of manufacture		
		Cl. 7.5		Durability & Legibility of markings	All marking shall be easily legible & durable. durability of marking shall be checked by rubbing the marking by hand with a piece of cloth soaked with petroleum spirit.		

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2.	Operating parameters tests.	**Cl. 6. 2**		Changeover to standby fuse in case of main fuse failure		The main fuse supply should be disconnected using a switch, the Load should automatically switch to standby fuse.		
		Cl. 6.3		Presence of MAIN fuse in circuit on startup and normal condition.		Before start, main and standby fuses should be intact. When system starts only MAIN Fuse should be in circuit and standby fuse should not be in circuit.		
		Cl. 6.5		Test PUSH Button		Pressing PUSH Button makes all indication LEDs GLOW simultaneously.		
		Cl. 6.6		Potential Free Contacts		Minimum six numbers PFC contact should be there and should be in normally MAKE condition. Check continuity on each pair by multi meter .		
		Cl. 6.7 & 6.8		On Failure of MAIN fuse	LED indications	The LED indication for particular main fuse changes from GREEN to RED.		
					Audio Alarm(Buzzer)	Buzzer should give audio Alarm.		
					Potential Free Contacts	Potential free contact assigned to MAIN fuse should break out. Check using multi meter there should not be any continuity.		
					Alarm Acknowledgement	Pressing of the 'Acknowledge' button on the unit shall cut off the alarm but the LED indication shall remain till the fuse is replaced.		

	Operating parameter tests.	**Cl. 6.7 & 6.8**		On Failure of Standby Fuse	LED indications	The LED indication for particular Standby fuse changes from GREEN to RED.		
					Audio Alarm(Buzzer)	Buzzer should give audio Alarm.		
					Potential Free Contacts	Potential free contact assigned to standby fuse should break out Check using multi meter there should not be any continuity.		
					Alarm Acknowledgement	Pressing of the 'Acknowledge' button on the unit shall cut off the alarm but the LED indication shall remain till the fuse is replaced.		

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3.	Operating parameters tests.	**Cl. 6.9**	a.	Indication LEDs and Audible alarm	The LED should light up till the fault persists and audible alarm shall only be reset. The visual indication should disappear when the fuse is replaced and RESET button is pressed. However, if another fuse is blown off after resetting / muting the buzzer, the audible buzzer should come again along with the visible indication.		
			b.	Fuse Holder on panel for Standby Fuses	(a) Standby fuse shall be mounted in a screw type fuse holder of panel mount type.		
					(b)The fuse holder shall be from reputed UL/UR/CSA/CE approved manufacturers. (To be verified from invoice /data sheet)		
					(c) The body of the fuse holder shall be UL-94 V-0 Thermoplastic. (To be verified from invoice /data sheet)		
					(d)The contacts shall be tinned copper with < 5milli ohm contact. (To be verified from invoice /data sheet)		
		6.10	c	Buzzer for Audible Alarm	Should have dual tone intermittent sound.		

S.No.	Name of test	Clause no.	Parameter	Procedure of Testing	Specified Value	Observed value	OK/ Not OK
4.	Applied High Voltage Test	**Cl. 8.3**	Effect of Applied High voltage 2000 Volts rms, sine wave with frequency 50-100 Hz. If body is being used as heat sink, the test voltage is 1500 Vrms	A test Voltage of 2000Volts rms is applied between the body and the input terminals of supply .	The equipment shall withstand for one minute without puncture & arcing		
				A test Voltage of 2000Volts rms is applied between the body and the fuse sensing terminals	The equipment shall withstand for one minute without puncture & arcing		
5.	Insulation Resistance Test	**Cl. 8.4**	Insulation Resistance	The Insulation Resistance shall be measured between the body and the fuse sensing terminals and supply terminals looped together at a potential of 500 V DC before & after HV test.	Greater than 100 Mega Ohms at 40°C & 60% RH before HV test		
					Greater than 100 Mega Ohms at 40°C & 60% RH after HV test		

Ambient temperature test (Cl. 9.2.3) : Five samples with GSM module and CAVA shall be subjected to Change of temperature test in one chamber (as per IS: 9000 Pt. XIV) for one cycle comprising of 1 hour at -10°C and 1 hour at +60°C and a recovery period for half an hour shall be provided.
Following test shall be conducted before and after ambient temperature test-

S.No.	Name of test	Clause no.	Parameter	Procedure of Testing	Specified Value	Observed value	OK/ Not OK
6.	Insulation Resistance Test	**Cl. 9.2.2 (i)**	Insulation Resistance	The Insulation Resistance shall be measured between the body and the fuse sensing terminals and supply terminals looped together at a potential of 500 V DC before & after HV test.	Greater than 100 Mega Ohms at 40°C & 60% RH before ambient temperature test		
					Greater than 10 Mega Ohms at 40°C & 60% RH after ambient temperature test		

S.No.	Name of test	Clause no.	Parameter	Input Voltage	Specified Value	Observed value		OK/ Not OK
						Before ambient test	After ambient test	
7.	Fluctuation in Input Voltage Test	Cl. 1.3	The FACS System should work satisfactorily either on 24V or 60V DC or 110V AC as specified in the purchase order +20% and -30%.	16.8-28.8Volts DC	Shall work normally			
				42-72 Volts DC	Shall work normally			
				77-132 Volts AC	Shall work normally			
			Reverse voltage protection	For 24 V and 60V DC	The system should not fail			

S.No.	Name of test	Clause no.		Parameter	Specified value	Observed value		OK/ Not OK
						Before ambient test	After ambient test	
8.	Functional Test For Common Audio Visual Alarm(CAVA) unit & GSM Modem	Cl. 6.14 For CAVA unit	i.	Power supply OK Indication	Yellow (5 mm) LED should be glowing for POWER ON.			
			ii.	LED indication (RED)/5mm for main Fuse	Shall be blinking in case of any main fuse getting blown			
			iii.	LED indication (RED)/5mm for Standby Fuse	It Shall be blinking if any of the standby fuse also is blown along with its Main fuse. Both the LEDs shall be lit in case of both Main and Standby getting blown.			
			iv.	Audio Alarm	Piezoelectric buzzer should give audio alarm for fuse failure			
			v.	Acknowledge Button (shall be non locking type push button)	On pressing shall cut the Audio Alarm but indications keep blinking till fault Persists.			
		Cl. 6.15 For GSM modem	a.	Mobile number and Station Code Configuration in GSM module if to be supplied with the system.	Mobile number and Station Code should be Configurable as specified in user manual of manufacturer & it should update list of Users & Station Code through SMS after configuration.			

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							Before ambient	After ambient	
9.	Functional Test For GSM Modem	**Cl. 6.15** For GSM modem	b.	Message Sending < 30 Sec.	For main Fuse Blown	SMS in Prescribed Formats for all these Events should be received on five Mobile numbers configured earlier along with the configured Station Code.			
			c.		For Standby Fuse Blown				
			d.		For Fuse Replaced &Restored				
		Cl. 6.16	For GSM modem	SMS Format to be sent		Main fuse blown standby operate: ATTENTION: FUSE BLOWN AT STATION XXXX STANDBY OPERATIVE Main And Standby Both Fuse Blown: ATTENTION: BOTH FUSES BLOWN AT STATION XXXX When a fuse is replaced: "FUSE REPLACED AT STATION XXXX"			

S.No.	Name of test	Clause no.	Parameter	Specified value	Observed value	OK/ Not OK
10.	Operating parameter after ambient temperature test	**Cl. 6. 2**	Changeover to standby fuse in case of main fuse failure	The main fuse supply should be disconnected using a switch. The Load should automatically switch to standby fuse.		
		Cl. 6.3	Presence of MAIN fuse in circuit on startup and normal condition.	Before start, main and standby fuses should be intact When system starts only MAIN Fuse should be in circuit and standby fuse should not be in circuit.		
		Cl. 6.5	Test PUSH Button	Pressing PUSH Button makes all indication LEDs GLOW simultaneously.		
		Cl. 6.6	Potential Free Contacts	Minimum six numbers PFC contact should be there and should be in normally MAKE condition. Check continuity on each pair by multi meter .		

S.No.	Name of test	Clause no.	Parameter		Specified value	Observed value	OK/ Not OK
11.	Operating parameter after ambient temperature test	**Cl. 6.7 & 6.8**	On Failure of MAIN fuse	LED indications	The LED indication for particular main fuse changes from GREEN to RED.		
				Audio Alarm(Buzzer)	Buzzer should give audio Alarm.		
				Potential Free Contacts	Potential free contact assigned to MAIN fuse should break out. check using multi meter there should not be any continuity.		
				Alarm Acknowledgement	Pressing of the 'Acknowledge' button on the unit shall cut off the alarm but the LED indication shall remain till the fuse is replaced.		
			On Failure of Standby Fuse	LED indications	The LED indication for particular Standby fuse changes from GREEN to RED.		
				Audio Alarm(Buzzer)	Buzzer should give audio Alarm.		
				Potential Free Contacts	Potential free contact assigned to standby fuse should break out. check using multi meter there should not be any continuity.		
				Alarm Acknowledgement	Pressing of the 'Acknowledge' button on the unit shall cut off the alarm but the LED indication shall remain till the fuse is replaced.		