



## **SEB Accepted Relay List**

<b>ISSUED BY</b>	<b>Protection, Control &amp; Instrumentation Division, Transmission Department</b>
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<b>VERSION</b>	<b>2.1</b>

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## **SEB Accepted Relay List**

The items shown in this SEB Accepted Relay List (ARL) includes protection relays, disturbance recorders and ancillary equipment used for transmission and distribution substation. The list stipulated in this document supersedes all preceding issues including revisions.

Any supplier/manufacturer who desire to have their items placed on the list, or any user believing an existing item should be removed from the list, or any communication calling attention to an error or omission in the list, such as an obsolete item, etc, should address to:

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**Attention: SEB ARL [Vice-President, Transmission for Chief Executive Officer]**

Every effort has been made to ensure the accuracy of this document. However, In case of any discrepancies, records of Transmission Protection, Control & Instrumentation Division are the authoritative source.

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## 1 Protection Relays

### 1.1 Current Differential Protection Relay

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Current Differential Protection	SIEMENS / Berlin, Germany	7SD522	7SD5221-4PB99-9HK5+ M1A+ N2A+ LOR	4.72	132kV and above	<ul style="list-style-type: none"> <li>Inclusion of internal UV &amp; OV protection function</li> </ul>
	ABB / Sweden	RED670	1MRK002810-AG, RED670 F00, Ver 2.2	2.2.3.13 (2.2.2)	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:-</li> <li>(a) PCM 600 2.8 Software</li> <li>(b) LAN Cable</li> </ul>
	GE /ALSTOM / Stafford, UK	P545	P545816A6M0760M	76	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:-</li> <li>(a) MiCOM S1 Agile Software</li> <li>(b) Communication Converter 2Mbps (P591601A0M0200B)</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P545	P54531EA3M0H48M-SEB	H4	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:-</li> <li>(a) Easergy Studio</li> <li>(b) Communication Converter 2Mbps (P-2M-L3A11A011A)</li> </ul>
	SIEMENS / Berlin, Germany	7SD 610	7SD6101-0BB09-0BJ0+M20	4.74	33kV and below	<ul style="list-style-type: none"> <li>P-Set 4.73</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P521	P521-B00Z112DE0-SEB	DE (Software Version)	33kV and below	

## 1.2 Distance Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Distance Protection	SIEMENS / Berlin, Germany	7SA 612	7SA6121-4NB99+5GB4+ M1A+LOR	4.74	132kV and above	<ul style="list-style-type: none"> <li>Inclusion of internal UV &amp; OV protection function</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P443	P44331EF3M0H48M-SEB	H4	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:-</li> <li>(a) Easergy Studio</li> <li>(b) Communication Converter 2Mbps (P-2M-L-3A11A011A)</li> </ul>
	GE / United Kingdom	Alstom Micom Px40 Agile P443	P443816F6M0760M	76 (Firmware) M (Hardware)	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:-</li> <li>(a) Micom S1 Agile Software Version 1.20 and above</li> <li>(b) Communication Converter G.703 2Mbps (P591602A0M0200B)</li> </ul>

### 1.3 Transformer Bias Differential Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Transformer Bias Differential protection	GE /ALSTOM / Stafford, UK	P643	P64392BF6M0060M	6	275kV and below	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR24	7SR2422-2BA11-0BA0	R8b-7c	275kV and below	
	SIEMENS / Berlin, Germany	7UT613	7UT6131-4EB91-1AA0+LOR	4.65	132kV and above	<ul style="list-style-type: none"> <li>For Transmission substation installation</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P632	P632849010F0311412653-921-SEB	653-700	132kV and above	<ul style="list-style-type: none"> <li>2 Windings</li> <li>Mandatory Accessories &amp; Software:               <ul style="list-style-type: none"> <li>(a) Easergy Studio</li> </ul> </li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P633	P633849910H0311418653-921-SEB	653-700	132kV and above	<ul style="list-style-type: none"> <li>3 Windings</li> <li>Mandatory Accessories &amp; Software:               <ul style="list-style-type: none"> <li>(a) Easergy Studio</li> </ul> </li> </ul>
	ABB / Sweden	RET670	1MRK 004 816-AC	1.2	132kV and above	<ul style="list-style-type: none"> <li>For Capacitor Bank</li> <li>Mandatory Accessories &amp; Software:               <ul style="list-style-type: none"> <li>(a) PCM 600 2.8 Software</li> </ul> </li> </ul>
	SIEMENS/ Berlin, Germany	7UT613	7UT6131-0EB02-1AA0	4.65	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P631	P631-449-000-0-0-311-412-652-921-SEB	311-412-652 (Software Version)	33kV and below	
	ABB/ Finland	RET 615	RET615 HBT DBABA NBA1 ANN 01G	5.0 FP1 (5.1.6)	33kV and below	

### 1.4 Restricted Earth Fault Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Restricted Earth Fault Protection	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR1101	7SR1101-1A12-2CA0	R4h-3d	275kV and below	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7PG23-5B3	7PG2311-1DA30-1BA0	NA	275kV and below	
	Schneider Electric / Wuxi, Jiang Su, China	P721	P721000Z112CB0-SEB	12.B	275kV and below	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:               <ul style="list-style-type: none"> <li>(a) Easergy Studio</li> </ul> </li> </ul>
	ABB/ Finland	REB611	REB611HBA ABA 1NN 01G	2.0 (2.0.1)	33kV and below	

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1.5 Busbar Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Busbar Protection	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR23	7SR2303-1BA77-OCA0	R8b-1b	132kV and Above	
	Schneider Electric / Wuxi, Jiang Su, China	P723	723000Z112CB0-SEB	12.B	275kV and below	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software: (a) Easergy Studio</li> </ul>
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR23	7SR2300-1BA12-OCA0	R8b-1b	33kV and below	



## 1.6 Overcurrent and Earth Fault Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Overcurrent and Earth Fault Protection	Schneider Electric / Wuxi, Jiang Su, China	P123	P123-B00- Z112-EB-0-SEB	<i>EB (Software Version)</i>	275kV and below	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR1103	7SR1103-1A12-2CA0	R4h-3d	275kV and below	
	SEL / USA	751A	751A500000X0X800000	R419	275kV and below	
	ABB / Finland	REF611	REF611 HBB ABA 1NA 1G	2.0 (2.0.1)	275kV and below	
	GE /ALSTOM / Stafford, UK	P14N	P14NB11A3B0530A	53	275kV and below	
	SIEMENS/ Berlin, Germany	7SJ612	7SJ6121-4EB91-1FA0+LOR	4.93	132kV and above	<ul style="list-style-type: none"> <li>For Transmission substation installation</li> </ul>
	SIEMENS/ Berlin, Germany	7SJ612	7SJ6121-EB02-1FA0	4.93	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>

### 1.7 Directional Overcurrent and Earth Fault Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Directional Overcurrent and Earth Fault Protection	SIEMENS/ Berlin, Germany	7SJ622	7SJ6221-4EB91-1FC0+LOR	4.93	132kV and Above	<ul style="list-style-type: none"> <li>For Transmission substation installation</li> </ul>
	SIEMENS / Berlin, Germany	7SJ622	7SJ6221-0EB02-1FC0	4.93	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	7SR1206	7SR1206-20A12-2CA0	R4h-3d	275kV and below	
	Schneider Electric / Wuxi, Jiang Su, China	P127	P127-BA0- Z112-FE-0-SEB	<i>FE (Software Version)</i>	275kV and below	
	ABB / Finland	REF 615	REF615 HBF FAEAG NBA1 ANA 1G	5.0 FP1 (5.1.6)	275kV and below	
	GE /ALSTOM / Stafford, UK	P14D	P14DB11A3C0530A	53	275kV and below	

### 1.8 Transformer Standby Earth Fault Protection Relay

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Transformer Standby Earth Fault protection	SIEMENS/ Berlin, Germany	7SJ600	7SJ6001-4EA00-0DA0	V3.21	132kV and Above	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India)	7SR1101	7SR1101-10A12-2CA0	R4h-3d	275kV and below	
	Schneider Electric / Wuxi, Jiang Su, China	P122	P122-B00- Z112-EB-0-SEB	<i>EB (Software Version)</i>	33kV and below	
	GE /ALSTOM / Stafford, UK	P14N	P14NB11A3B0530A	53	275kV and below	

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**1.9 Sensitive Earth Fault Protection Relay**

Function	Manufacturer /Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Sensitive Earth Fault Protection	SIEMENS / Berlin, Germany	7SJ612	7SJ6122-0EB92-1FB0	4.93	33kV and below	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India)	7SR1101	7SR1101-30A12-2CA0	R4h-3d	33kV and below	

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1.10 Circuit Breaker Fail Protection Relay

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Circuit Breaker Failure Protection	SIEMENS / Berlin, Germany	7VK611	7VK6111-4AB91-4YCO+LOR	4.71	132kV and above	
	ABB / Sweden	REQ650	REQ650*1.3-A11X00-X00- B1X0-D-0-S0-E-SA3-AAXX-F	1.3.5.1 (Firmware) 1.3.0.4 (Product Version)	132kV and above	
	SEL /USA	751A	751A500000X0X800000	R419	275kV and below	
	Schneider Electric / Wuxi, Jiang Su, China	P821	P821B00Z112AE0-SEB	10.E	275kV and below	
	SIEMENS / Berlin, Germany or Goa, India	7SR1103	7SR1103-10A12-2CA0	R4h-3d	33kV and below	
	SIEMENS / Berlin, Germany	7SV600	7SV6001-0EA00-0DA0	3.02	33kV and below	

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1.11 Over/Under Frequency Protection Relay

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Over / Under Frequency	SEL /USA	751A	751A500000X73800000	R419	275kV and below	
	SIEMENS / Berlin, Germany or Goa, India	7RW	7RW8020-5EB96-1DA0+LOR	4.62	132kV and Above	<ul style="list-style-type: none"> <li>For Transmission substation installation</li> </ul>
		7RW	7RW8020-5EB00-1DA0	4.62	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>

### 1.12 Over/Under Voltage Protection Relay

Function	Manufacturer/Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Over /Under Voltage	SIEMENS / Berlin, Germany or Goa, India	7RW	7RW8020-5EB96-1DA0+LOR	4.62	132kV and Above	
	SEL /USA	751A	751A500000X73800000	R419	275kV and below	
	SIEMENS (REYROLLE) / Goa, India	7SR158	7SR1587 – 5HA12-2DA0/BB	2436H80011R4e-2a	275kV and below	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:               <ol style="list-style-type: none"> <li>Reydisp Evolution</li> <li>Type B USB</li> </ol> </li> </ul>
	SIEMENS (REYROLLE) / Goa, India	7SR191	7SR1916-1HA12-2CAO	R2e-1a	275kV and below	<ul style="list-style-type: none"> <li>For Capacitor Bank protection application</li> <li>Mandatory Accessories &amp; Software:               <ol style="list-style-type: none"> <li>Reydisp Evolution</li> <li>Type B USB</li> </ol> </li> </ul>

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**1.13 Shunt Reactor High Impedance Circulating Protection Relay**

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Shunt Reactor High Impedance Circulating Protection	SIEMENS (REYROLLE) / Berlin, Germany or Goa , India	7SR23	7SR2302-1BA77-OCA0	R8b-1b	275kV and below	



### 1.14 Autoreclose + Synchro-Check Relay

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Autoreclose + Synchro-check	SIEMENS/ Berlin, Germany	7VK	7VK6111-4AB91-4YN0+LOR	4.71	132kV and above	
	Schneider Electric / Wuxi, Jiang Su, China	P841	P841311A3M0G78M-SEB	G7	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software: (a) Easergy Studio</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P123	P123-B00- Z112-EB-0-SEB	<i>EB (Software Version)</i>	33kV and below	
	SEL /USA	751A	751A600000X00800000	R419	33kV and below	
	SIEMENS / Berlin, Germany or Goa, India)	7SR1103	7SR1103-10A12-2DA0	R4h-3d	33kV and below	

### 1.15 Synchro-Check Relay

Function	Manufacturer/ Country	Relay Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Synchronising	SIEMENS/ Berlin, Germany	7VK	7VK6101-4AB91-4YN0+LOR	4.71	132kV and above	<ul style="list-style-type: none"> <li>For transmission substation installation</li> </ul>
	Schneider Electric / Wuxi, Jiang Su, China	P841	P841311A3MOG78M	G7	132kV and above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software: (a) Easergy Studio</li> </ul>
	SIEMENS (REYROLLE) / Goa, India	7SR157	7SR1578-5HA12-2CAO/BB	2436H80010R4e-2a	275kV and below	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software: (a) Reydisp Evolution (b) Type B USB</li> </ul>
	SIEMENS / Berlin, Germany or Goa, India	7VK	7VK6101-0AB02-4YN0	4.71	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>
	SIEMENS / Berlin, Germany or Goa, India	7RW	7RW8020-5EB96-1DC0+LOR	4.62	132kV and above	<ul style="list-style-type: none"> <li>For transmission substation installation</li> </ul>
	SIEMENS / Berlin, Germany or Goa, India	7RW	7RW8020-5EB00-1DC0	4.62	33kV and below	<ul style="list-style-type: none"> <li>For Distribution substation installation</li> </ul>
	SEL /USA	751A	751A500000X72800000	R419	33kV and below	

### 1.16 Capacitor Bank Protection Relay

Function	Manufacturer/ Country	Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
<ul style="list-style-type: none"> <li>Capacitor unbalance/ thermal overload protection</li> <li>Reactor thermal overload protection</li> <li>Resistor thermal overload/open circuit protection</li> </ul>	SIEMENS (REYROLLE) / Goa, India	7SR191	7SR1916-1HA12-2CAO	R4e-2a	275kV and below	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:</li> <li>(a) Reydisp Evolution</li> <li>(b) Type B USB</li> </ul>
	TRENCH /Austria	CPR 04	CPR4-00-110.	4v81 (Software Version: 5v1)	132kV and Above	<ul style="list-style-type: none"> <li>Mandatory Accessories &amp; Software:</li> <li>(a) Manual</li> <li>(b) CD with software</li> <li>• PC-software Version 5v10</li> <li>(c) Communication Cable</li> <li>(d) Relay Calibration Certificate</li> </ul>

## 2 Disturbance Recorder

Function	Manufacturer/ Country	Model	Ordering Code	Firmware Version	Voltage Limit	Remarks
Disturbance Recorder	QUALITROL / Northern Ireland	BEN 6000	BEN 6000	2.5.25	275kV and below	
	SIEMENS/ Berlin, Germany	7KE85	7KE85-JAAA-AA0-0AAAA0- AA8111-13113A-AAA000- 000AC1-CB1BA1-CB1CB1- CB1CB1-BC1CG0- <del>000</del>	7.50	275kV and below	(a) Mandatory Accessories & Software:- (b) DIGSI 5 software premium) (c) SICAM PQ Analyzer (PQA) software (d) SICAM PQS/ PAS (Data Concentrator) (e) GPS (f) Ethernet Switch

### 3 Ancillary Equipment

#### 3.1 Trip Circuit Supervision Relay

Function	Manufacturer/ Country	Model	Ordering Code	Voltage Limit	Remarks
Trip Circuit Supervision	GE /ALSTOM / Stafford, UK	MVAX31	MVAX31S1DE0754A	275kV and below	
	SIEMENS / Europe	7PA3032	7PA3032-1AA00-1	275kV and below	(a) Single phase
	RMS / Australia	ALPHA	XR5-00 -1/4/60 (ALPHA XR Series)	275kV and below	
	Schneider Electric / Spain	REL913	REL91323	275kV and below	
	ABB / Sweden	SPER IBI	-	33kV and below	

### 3.2 Lockout Relay

Function	Manufacturer/ Country	Model	Ordering Code	Voltage Limit	Remarks	
Lockout	GE /ALSTOM / Stafford, UK	MVAJ105	MVAJ105RA0802B	275kV and below	(a) Voltage rating : 110/125V	
	SIEMENS / Europe	7PA2231	7PA2001-1	275kV and below		
	RMS/ Australia	ALPHA/ DELTA/ 6RJ	TR 5/12 - 00 - 1/2/3/4 0	(ALPHA TR Series)	275kV and below	
			AR 5/12 - 00 - 1/2/3/4 0	(ALPHA AR Series- 1 element)		
			AR25 - 00 - 1/2/3/4 0	(ALPHA AR Series- 2 element)		
			TRD-400	(DELTA TRD Series)		
			6RJ25-20-00	(6RJ Series)		
	Schneider Electric / Spain	REL912	REL91263	(4 changeover contacts)	275kV and below	
			REL91283	(8 changeover contacts)		

### 3.3 Tripping Relay

Function	Manufacturer/ Country	Model	Ordering Code	Voltage Limit	Remarks
Tripping	ABB / India	ABB RXMS	RXMS1 RK216 x63-AN	275kV and below	
	SIEMENS/ Europe	7PA2732	7PA2002-0AA00-0	275kV and below	
	SIEMENS/ Berlin, Germany or Goa, India	TR221	7PG1522-1HA40-1AF0	275kV and below	(a) For Busbar Protection tripping
		AR 011	7PG1101-1EA10-0C00		(b) For Busbar Zone indicating
	RMS/ Australia	ALPHA/ DELTA	TR 5/12 - 00 - 1/2/3/4 0	275kV and below	
			(ALPHA TR Series)		
			AR 5/12 - 00 - 1/2/3/4 0		
			(ALPHA AR Series- 1 element)		
	AR 25 - 00 - 1/2/3/4 0	275kV and below			
	(ALPHA AR Series-2 element)				
TRD-400 - (DELTA TRD Series)					
Schneider Electric / Spain	REL912	REL91203	275kV and below		
		(4 changeover contacts)			
		REL91223			
		(Fast trip relay with 4 changeover contacts)			

### 3.4 Test Terminal Block

Function	Manufacturer/ Country	Model	Ordering Code	Voltage Limit	Remarks
Testing Facilities	ABB / India	RTXP 18/24	a) Test Socket: a. RTXP 18 RK926-115-00 b. RTXH 24 RK926 315-00 b) Test Plug: a. RTXH 18 RK926 011-BC b. RTXH 24 RK926 016-AA	275kV and below	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	2RMLG07	c) Test Socket: 7XG2220-3AA00-0AA0 d) Test Plug: 7XG2240-3AA00-0AA0	275kV and below	
	RMS/ Australia	4M Series	<ul style="list-style-type: none"> <li>• Test Socket: 4M400-00</li> <li>• Test Plug: 4M420-00</li> </ul>	132kV and above	
	Schneider Electric / Spain	ETB14	<ul style="list-style-type: none"> <li>• Test Socket: ETB14000000000000000000-H</li> <li>• Test Plug: ETB14PH</li> </ul>	132kV and above	
	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	2RMLG01	<ul style="list-style-type: none"> <li>• Test Socket: 7XG2220-1AA00-0AA0</li> <li>• Test Plug: 7XG2240-1AA00-0AA0</li> </ul>	33kV and below	
	RMS / Australia	4M Series	<ul style="list-style-type: none"> <li>• Test Block: 4M200-01</li> <li>• Test Plug: 4M220-00</li> </ul>	33kV and below	



### 3.5 DC Supervision Relay

Function	Manufacturer/ Country	Model	Ordering Code	Voltage Limit	Remarks
DC Supervision	SIEMENS (REYROLLE) / Berlin, Germany or Goa, India	XR152	7PG1741-3BD10-4AA0	275kV and below	
	Schneider Electric / Spain	REL913	REL91344	275kV and below	
	RMS / Australia	Delta XRD Series	XRD-4◇◇	275kV and below	

#### Important Note:

1. The recommended relay ordering no. indicated by ◇ are to be specified based on actual installation requirement / SEB application.
2. The protection relay manufacturer/supplier shall provide 10 years product warranty from the date of supply. Faulty relays shall be collected from and replacement shall be delivered to SEB office without cost to SEB.
3. The Disturbance recorder manufacturer/supplier shall provide 5 years product warranty from the date of supply. Faulty disturbance recorders shall be collected from and replacement shall be delivered to SEB office without cost to SEB.
4. The ancillary equipment manufacturer/supplier shall provide 5 years product warranty from the date of supply. Faulty disturbance recorders shall be collected from and replacement shall be delivered to SEB office without cost to SEB.