

# **LIST OF MATERIALS**

## **Transmission (EHV Substation)**

**Acceptable for Use on Systems of  
SARAWAK ENERGY BERHAD**

DISCLAIMER

This document contains information proprietary to SEB and shall not be reproduced, transferred to other documents or disclosed to others or used for any purpose other than for which it is furnished without the prior written permission of SEB.

The items shown in this Transmission Acceptable Products List (TAPL) covers material and major equipment used for transmission substation. The list stipulated in this document supersedes all preceding issues including revisions. The updated documents shall be made available on SEB website.

Manufacturer who desire to have their items listed in the Transmission Acceptable Products List (TAPL) for transmission substation or wish to address any omission in the list, such as an obsolete item, etc, should address to: -

**Chief Executive Officer  
Sarawak Energy Berhad  
Menara Sarawak Energy  
No. 1, The Isthmus, 93050 Kuching  
Sarawak, MALAYSIA.  
Tel : +6 082-388388  
Fax : +6082-481811 / +6082-344433**

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

## INDEX

<u>Item No.</u>	<u>Contents</u>	<u>Page</u>
<b>1.0</b>	<b>SUBSTATION PRIMARY EQUIPMENTS .....</b>	<b>1</b>
1.1	275/132/36kV, 275/36kV and 132/36kV Auto/Power Transformer.....	1
1.1.1	275/132/36kV Auto Transformer .....	1
1.1.2	275/36kV Power Transformer.....	1
1.1.3	132/36kV Power Transformer.....	1
1.2	275kV Shunt Reactor .....	2
1.3	Circuit Breaker .....	2
1.3.1	275kV Circuit Breaker.....	2
1.3.2	132kV Circuit Breaker.....	2
1.4	275kV and 132kV Isolator .....	2
1.5	275kV and 132kV Current Transformer.....	2
1.6	275kV and 132kV Capacitor Voltage Transformer .....	3
1.7	275kV, 132kV and 33kV Surge Arrester.....	3
1.8	275kV, 132kV and 33kV Connector .....	3
1.9	Neutral Earthing Equipments .....	3
1.9.1	33kV Neutral Earthing Resistor .....	3
1.9.2	33kV Neutral Isolator .....	4
1.10	275kV and 132kV Capacitor Units and Capacitor Banks.....	4
1.11	145kV Gas Insulated Switchgears .....	4
1.12	275kV Gas Insulated Switchgears .....	4
1.13	500kV Gas Insulated Switchgears .....	4
1.14	DC System .....	5
	<b>APPENDIX A – STL MEMBERS LABORATORIES .....</b>	<b>6</b>

## 1.0 SUBSTATION PRIMARY EQUIPMENTS

Where NOT specified as GIS, the equipment listed is defined for AIS substations.

### 1.1 275/132/36kV, 275/36kV and 132/36kV Auto/Power Transformer

#### 1.1.1 275/132/36kV Auto Transformer

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
ABB	Up to 240 MVA	Thailand; Chongqing China
TBEA Shenyang Transformer Group Co	Up to 240 MVA	Shenyang, Lioneing Province, China
GE Grid Solutions	Up to 240 MVA	Wuhan, China
SPECO	Up to 240MVA	Shangdong, China
PTCG*	Up to 240MVA	Indonesia
Hyundai Electric & Energy Systems Co., Ltd.	Up to 240MVA	Korea
Siemens	Up to 240MVA	Jinan, China
<b>*Defect liability period further extended to another 3 years by OEM after completion of the main contract.</b>		

#### 1.1.2 275/36kV Power Transformer

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Meidensha	Up to 120 MVA	Japan
ABB	Up to 120 MVA	Thailand; Chongqing China
TBEA Shenyang Transformer Group Co	Up to 120 MVA	Shenyang, Lioneing Province, China
GE Grid Solutions	Up to 120 MVA	Wuhan, China
SPECO	Up to 120MVA	Shangdong, China
PTCG*	Up to 120 MVA	Indonesia
Hyundai Electric & Energy Systems Co., Ltd.	Up to 120 MVA	Korea
Siemens	Up to 120MVA	Jinan, China
<b>*Defect liability period further extended to another 3 years by OEM after completion of the main contract.</b>		

#### 1.1.3 132/36kV Power Transformer

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
ABB	Up to 120 MVA	Thailand
TBEA Shenyang Transformer Group Co	Up to 120 MVA	Shenyang, Lioneing Province, China
Tirathai	Up to 120 MVA	Thailand
GE Grid Solutions	Up to 120 MVA	Wuhan, China
Meidensha	Up to 80 MVA	Japan
ABB	Up to 80 MVA	Chongqing China

Daihen	Up to 80 MVA	Thailand
SPECO	Up to 120MVA	Shangdong, China
PTCG*	Up to 80 MVA	Indonesia
Hyundai Electric & Energy Systems Co., Ltd.	Up to 80 MVA	Korea
Siemens	Up to 120MVA	Jinan, China
<b>*Defect liability period further extended to another 3 years by OEM after completion of the main contract.</b>		

## 1.2 275kV Shunt Reactor

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
ABB	-	Chongqing China
Crompton Greave	-	India
TBEA Shenyang Transformer Group Co	Up to 10MVAR	Shenyang, Lioing Province, China

## 1.3 Circuit Breaker

### 1.3.1 275kV Circuit Breaker

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens*	3AP series	Germany / India
ABB*	HPL series	Sweden / Beijing China
GE Grid Solutions*	GL314 series	France / Suzhou China
<b>*Circuit breaker shall be spring operated mechanisms.</b>		

### 1.3.2 132kV Circuit Breaker

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens*	3AP series	Germany / India
ABB*	LTB series	Sweden / Beijing China
GE Grid Solutions*	GL312 series	Germany / Suzhou China
<b>*Circuit breaker shall be spring operated mechanisms.</b>		

## 1.4 275kV and 132kV Isolator

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Coelme	CBD series	Italy
GE Grid Solutions	S2DA series	Italy
Hapam	SBII series	The Netherland

## 1.5 275kV and 132kV Current Transformer

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
ABB	IMB series	Sweden
GE Grid Solutions	OSKF series	Brazil

Trench	IOSK series	France
TBEA Shenyang Transformer Group Co	AGU series (132kV only)	Shenyang, Lioing Province, China
GE Grid Solutions	OSKF series	India
Emek Elektrik Endustrisi A.S	AT series	Turkey

### 1.6 275kV and 132kV Capacitor Voltage Transformer

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
ABB	CPB series	Sweden
GE Grid Solutions	OTCF series	USA
Trench	TCVT series	Italy
GE Grid Solutions	CCV series	India
Emek Elektrik Endustrisi A.S	KGT series	Turkey

### 1.7 275kV, 132kV and 33kV Surge Arrester

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens	3EP series	Germany
ABB	EXLIM series	Sweden
Hubbell	MH series	USA
Tridelta	SB series	Germany
Xi'AN XD	Y20W Series Y10W Series Y5W Series	China

### 1.8 275kV, 132kV and 33kV Connector

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Tyco Simel	-	France
Ribe Subcon	-	Austria
GE Grid Solutions	-	Italy
Lorünser	-	Austria
Arruti	-	Spain

### 1.9 Neutral Earthing Equipments

#### 1.9.1 33kV Neutral Earthing Resistor

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Powercap	-	Malaysia
AnyOhm	-	Malaysia
Pestech	-	Malaysia

### 1.9.2 33kV Neutral Isolator

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
AEM	-	Australia
Power Isolator	-	England
Pestech	-	Malaysia

### 1.10 275kV and 132kV Capacitor Units and Capacitor Banks

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens	-	Brazil
GE Grid Solutions	-	Finland
ABB	-	Xi'an China

### 1.11 145kV Gas Insulated Switchgears

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
GE Grid Solutions	F35	Suzhou, China
ABB	ELK-04	Xiamen, China
Hyundai Electric & Energy Systems Co., Ltd.	145SP	Ulsan, Korea
Hyosung	HSG-144	Changwon, Korea
Siemens	8DN8	Shanghai, China

### 1.12 275kV Gas Insulated Switchgears

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens	8DQ1	Berlin, Germany
GE Grid Solutions	B105	Aix-les-Bains, France
ABB	ELK-14	Zürich, Switzerland
Hyundai Electric & Energy Systems Co., Ltd.	550SR	Ulsan, Korea

### 1.13 500kV Gas Insulated Switchgears

Manufacturer	Type / Catalogue / Model. No	Country of Manufacture
Siemens	8DQ1	Berlin, Germany/ Shanghai China
GE Grid Solutions	T155	Aix-les-Bains, France/ Suzhuo, China
ABB	ELK-3	Zürich, Switzerland/ Xiamen China
Hyundai Electric & Energy Systems Co., Ltd.	550SR	Ulsan, Korea
Hyosung	550HSG	Changwon, Korea

#### 1.14 DC System

<b>Manufacturer</b>	<b>Type / Catalogue / Model. No</b>	<b>Country of Manufacture</b>
AEG Power Solutions	-	Singapore
Sunpower Technologies Sdn. Bhd	-	Malaysia
PMI Elektrik ve Elektronik Sistemleri Dis. Tic. Ltd. Sti	-	Turkey



## APPENDIX A – STL MEMBERS LABORATORIES

STL Member	Member Laboratories	Country
<b>Intertek (ASTA)</b>	Testing & Certification Australia Lane Cove Testing Station	Sydney, Australia
<b>KEMA</b>	KEMA Testing, Inspections & Certification High Power Laboratory	AR Arnhem, The Netherlands
	KEMA Testing, Inspections & Certification KEMA High-Voltage Laboratory	AR Arnhem, The Netherlands
	KEMA Testing, Inspections & Certification KEMA – Powertest Inc	Chalfont, USA
<b>CESI</b>	CESI Centro Elettrotecnico Sperimentale Italiano S.p.A.	Milano MI, Italy
	Institut “Prieffeld fur elektrische Hochleitungstechnik” GmbH (IPH)	Berlin, Germany

	FGH Engineering & Test GmbH	Mannheim, Germany
<b>KERI</b>	High Power High Voltage Testing & Evaluation Division in Main Office	Gyeongsangnam, South Korea
	Power Apparatus Testing & Evaluation Division in Ansan office Korea Electrotechnology Research Institute	Gyeonggi-do, South Korea
<b>CPRI</b>	Central Power Research Institute Central Research & Testing Laboratory (CRTL)	Bangalore, India
	Central Power Research Institute Switchgear Testing & Development Station (STDS)	Bhopal, India
	Central Power Research Institute UHV Research Laboratory (UHVRL)	Hyderabad, India
<b>PEHLA</b>	ABB Switzerland Ltd. High Voltage Products and Components, Dept. PTHX	Baden, Switzerland
	High-Voltage Institute Kassel	Kassel, Germany

	GE Grid Solutions GmbH	
	ABB AG Calor Emag Medium Voltage Products	Ratingen, Germany
	FGH Engineering & Test GmbH	Mannheim, Germany
	Institut „Prueffeld fur elektrische Hochleistungstechnik“ GmbH (IPH)	Berlin, Germany
	Siemens AG	Berlin, Germany
	Siemens AG	Frankfurt am Main, Germany
<b>SATS</b>	ABB AB	Ludvika, Sweden
	STRI AB	Ludvika, Sweden
	NEXANS Norway AS	Halden, Norway
	NEFI	Skien, Norway
<b>ESEF</b>	Laboratoires des Matériels Electriques (LME), Site des Renardieres, EDF-R&D-LME	Moret-sur-Loing Cedex, France
	Centre d'Essais Rhodanien De l'Appareillage, CERDA, GE Grid Solutions	Villeurbanne Cedex, France

	L2E VOLTA, Schneider Electric Industries SAS	Grenoble Cedex 9, France
<b>JSTC</b>	Central Research Institute of Electric Power Industry CRIEPI	Kanagawa, Japan
	Japan AE Power Systems Corp. Kokubu High Power Laboratory 1-1, Kokubu-cho	Ibaragi, Japan
	Japan AE Power Systems Corp. Numazu High Power Laboratory	Shizuoka, Japan
	Mitubishi Electric Corp. High Voltage & High Power Testing Laboratories	Hyogo, Japan
	High Voltage and High Power Testing Laboratory Nissin Electric Co., Ltd	Kyoto, Japan
	Toshiba Corp. Hamakawasaki High Voltage and High Power Testing Laboratory	Kanagawa, Japan
<b>STLNA</b>	Powertech Laboratories Inc.	British Columbia, Canada
		Franksville, USA

	Cooper Power Systems – High Power Lab	
	KEMA PowerTest Inc.	Chalfont, USA
	Eaton Corp.	Pittsburgh, USA
	LAPEM-CFE	Irapuato, GTO Mexico
	S&C Electric Company	Chicago, USA
	AREVA T&D BRASIL	Minas Gerais, Brasil
<b>VEIKI-VNL</b>	VEIKI-VNL Electric Large laboratories Ltd	Budapest, Hungary
<b>ZKU</b>	ZKU, Zkušebnictví, a.s. Czech Republic	Czech Republic
	ZKU Member Laboratories Zkušebnictví, a.s. (ZKU) Czech Republic	