

Notice to Bidder

To comply with the ENGINEER ACT, B.E. 2542 FOR THE CONSTRUCTION WORK RELATED TO DESIGN OR CONSTRUCTION SUPERVISION WORK

The Contractors should be aware of the following:

1. The Contractor who is a juristic person is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.
2. Where the Contractor is a joint venture or consortium, the Contractor shall comply with the following requirements: -
 - 1) In case of a joint venture, the joint venture is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.
 - 2) In case of a consortium, only the member of the consortium who will be responsible for the Design or Construction Supervision Work is required to obtain a License to Practice the Controlled Engineering Profession issued by the Council of Engineers Thailand.

NOTE : If you have any questions, please contact COUNCIL OF ENGINEERS THAILAND.

Address : 1616/1 Ladprao, Wangthonglang, Bangkok, Thailand 10310

Telephone : 1303

Email : coe@saraban.mail.go.th

ประชาสัมพันธ์ผู้ประกอบการเพื่อทราบ

เพื่อให้การดำเนินงานสำหรับงานจ้างก่อสร้างที่มีลักษณะงานด้านการออกแบบหรือควบคุมงานก่อสร้าง สอดคล้องกับพระราชบัญญัติวิศวกร พ.ศ. 2542 จึงขอแจ้งแนวทางในการดำเนินงาน ดังนี้

1. ผู้รับจ้างที่เป็นนิติบุคคล ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร
2. ผู้รับจ้างที่ดำเนินการในรูปแบบของ “กิจการร่วมค้า”
 - (1) กรณีที่กิจการร่วมค้าได้จดทะเบียนเป็นนิติบุคคลใหม่ กิจการร่วมค่านั้นต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร
 - (2) กรณีที่กิจการร่วมค้าไม่ได้จดทะเบียนเป็นนิติบุคคลใหม่ เฉพาะนิติบุคคลที่มีหน้าที่เป็นผู้รับผิดชอบงานวิศวกรรมออกแบบหรือควบคุม ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

หมายเหตุ หากมีข้อสงสัย โปรดติดต่อ สภาวิศวกร

ที่อยู่ : 1616/1 ถนนลาดพร้าว แขวงวังทองหลาง เขตวังทองหลาง กรุงเทพมหานคร 10310

เบอร์ติดต่อ : 1303

อีเมล : coe@saraban.mail.go.th

EGAT's Privacy Notice on Procurement, Inventory Management and Contract Administration

Electricity Generating Authority of Thailand (EGAT) has performed the protection of the Personal Data regarding procurement, inventory management and contract administration to be in accordance with the **Personal Data Protection Act B.E. 2562** (the "2019 PDPA"), which comes into effect on June 1, 2022.

Details about EGAT's Privacy Notice on Procurement, Inventory Management and Contract Administration are available for you at https://www.egat.co.th/privacy-notice-procurement_en.html or the below QR Code.



The Redaction of Sensitive Personal Data

EGAT has announced the Privacy Notice on Procurement, Inventory Management and Contract Administration for the collection, use or disclosure of Personal Data, excluding the Sensitive Personal Data.

Should the documents you wish to submit to EGAT contain the Sensitive Personal Data as defined in Section 26 of the 2019 PDPA, pertaining to racial, ethnic origin, political opinions, cult, religious or philosophical beliefs, sexual behavior, criminal records, health data, disability, trade union information, genetic data, biometric data, or of any data which may affect you in the same manner, you shall redact or conceal such data before submitting to EGAT.

ประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญาของ กฟผ.

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) ได้ดำเนินการคุ้มครองข้อมูลส่วนบุคคลสำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา เพื่อให้เป็นไปตามพระราชบัญญัติคุ้มครองข้อมูลส่วนบุคคลของประเทศไทย พ.ศ. 2562 (PDPA) ซึ่งมีผลบังคับใช้อย่างครบถ้วน ตั้งแต่วันที่ 1 มิถุนายน 2565 ทั้งนี้ ท่านสามารถศึกษารายละเอียดประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา ได้ที่ <https://www.egat.co.th/privacy-notice-procurement.html> หรือที่ QR Code ด้านล่าง



การขิดฆ่าข้อมูลส่วนบุคคลอ่อนไหว

กฟผ. มีประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญา เพื่อใช้ในการเก็บรวบรวม ใช้ หรือเปิดเผย ข้อมูลส่วนบุคคล แต่ไม่เก็บข้อมูลส่วนบุคคลอ่อนไหว หากเอกสารของท่านที่ต้องส่งมอบให้ กฟผ. มีข้อมูลส่วนบุคคลอ่อนไหวตามที่ถูกบัญญัติไว้ในมาตรา 26 ของ PDPA ดังนี้ เชื้อชาติ เผ่าพันธุ์ ความคิดเห็นทางการเมือง ความเชื่อในลัทธิ ศาสนาหรือปรัชญา พฤติกรรมทางเพศ ประวัติอาชญากรรม ข้อมูลสุขภาพ ความพิการ ข้อมูลสหภาพแรงงาน ข้อมูลพันธุกรรม ข้อมูลชีวภาพ หรือข้อมูลอื่นใด ซึ่งกระทบต่อเจ้าของข้อมูลส่วนบุคคลในทำนองเดียวกันรวมอยู่ด้วย ขอให้ท่านขิดฆ่า หรือปกปิดข้อมูลดังกล่าว ก่อนส่งมอบให้แก่ กฟผ.

Notice to Bidder

Subject : Online Payment for Purchase of Bidding Documents

Please be informed of the online payment for purchase of bidding documents as follows:

- 1) Download the Registration Form and fill out all necessary information by typing. (Complete data is required.)
- 2) Payment shall be made by bank transfer or telegraphic transfer to EGAT's account no. 109-6-01958-2 (swift code : KRTHTHBK), Krung Thai Bank Public Company Limited, Bangkruai Branch, Nonthaburi.

All bank charges and fees incurred by the payment of bidding documents shall be under the buyer's responsibility.

- 3) Submit the fill-out Registration Form and the proof of payment from 1) to the email address of the in-charge officer and procurement.tse@egat.co.th in the CC. before 15.00 hrs. Bangkok Standard Time.
- 4) After the payment has been verified for approximately 3 working days, the in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form.

Registration Form

Invitation to Bid No. IPPP-S-01

Supply and Construction of 500 kV Phanom Sarakham Substation (GIS) and
Improvement of 500 kV Pluak Daeng and 500 kV Wang Noi Substations
Transmission System Development for Power Purchase from IPP Power Plants
Available Duration for Purchasing : January 26, 2024 - February 26, 2024

Price of Bidding Documents : USD 500.- or THB 15,000.-

Instructions

- 1) Fill out this Registration Form in English by typing. (Complete data is required.)
- 2) Payment shall be made by bank transfer or telegraphic transfer to EGAT's account no. 109-6-01958-2 (swift code : KRTHTHBK), Krung Thai Bank Public Company Limited, Bangkruai Branch, Nonthaburi.
- 3) Submit the filled-out Registration Form and the proof of payment to the in-charge officer via email (with cc. procurement.tse@egat.co.th) before 15.00 hrs. Bangkok Standard Time.
- 4) The in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form, which will take approximately 3 working days.

For Purchaser		TAX ID :	
No.	Receipt No. :	Date :	
Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
Local Representative			
Address			
		Tax ID :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
For Procurement Officer		Change of Bidder's Name	TAX ID :
Bidder's Letter No. :		Dated :	
New Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
<u>Contact Information of In-charge Officer</u>			
Name	Chalita Pengnoo		
Email address	chalita.pengnoo@egat.co.th		
Telephone No.	66 2436 0347		
Mobile No.	669 5429 3721		



Invitation to Bid No. IPPP-S-01

(Revision 1)

**Supply and Construction of 500 kV Phanom Sarakham Substation (GIS) and
Improvement of 500 kV Pluak Daeng and 500 kV Wang Noi Substations
Transmission System Development for Power Purchase from IPP Power Plants
Two-Envelope (Pre-Qualification)**

The Electricity Generating Authority of Thailand (EGAT) is calling for the subject Invitation to Bid to be financed by EGAT's fund. The escalation factor (K) for price adjustment is applied to this Bid.

Place of Construction : Phanom Sarakham Substation (GIS), Pluak Daeng Substation and Wang Noi Substation

Medium Cost (including Value Added Tax) : THB 1,300,000,000.-

Eligibility of Bidders

1. The Bidder and the Equipment shall be named in EGAT Accepted List as specified in the bidding documents.
2. The Bidder shall be a juristic person who provides such services and shall not be named in the List of Work Abandoners published by the Permanent Secretary, Ministry of Finance, and/or in the Debarment List and/or in the List of Work Abandoners declared by EGAT.
3. The Bidder shall not be a Jointly Interested Bidder with other Bidders as from the date of EGAT's issuance of the Invitation, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" for this Invitation.
4. The Bidder shall not either be EGAT's consultant or involve in EGAT's consultancy company under this Invitation to Bid, or shall not have EGAT's personnel involved in his business as shareholder having voting right that can control his business, director, manager, officer, employee, agent, or consultant except those who are officially ordered by EGAT to act or participate therein.
5. The Bidder shall not be the person who is privileged or protected not to be taken any legal proceedings under Thai Court; Provided that such Bidder's government declares that such special privilege is waived.
6. The Bidder who is a joint venture or consortium shall carry out all the work under such formation from the time of bidding until the fulfillment of the Contract.

Chattiya C.

Availability of Bidding Documents

Bidding Documents will be available for online purchase during 8:00 hrs. to 15:00 hrs., Bangkok Standard Time, as from January 26, 2024 to February 26, 2024 at USD 500.- or THB 15,000.- per copy, non-refundable.

Please find more details for online purchasing process at <http://www4.egat.co.th/procurement/biddingeng/> or contact for further information at telephone no. 66 2436 0342 or procurement.tse@egat.co.th.

Delivery of Bids

Technical and Price Proposal Submission Date and Technical Proposal Opening Date is postponed from April 3, 2024 to April 18, 2024. Technical and Price Proposal shall be submitted at Bidding Room, 1st Floor, Tor 082 Building during 09:30 hrs. to 10:00 hrs., Bangkok Standard Time, and Technical Proposal will be opened publicly at 10:00 hrs.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

April 2 , 2024

Chattiya C.

(Miss Chattiya Chandhanayingyong)

Chief, International Procurement Department - Transmission Segment



(ฉบับแก้ไข ครั้งที่ 1)

ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย
เรื่อง ประกวดราคาจ้าง เลขที่ IPPP-S-01
ประกวดราคา 2 ซอง (Pre-Qualification)

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500 kV พนมสารคาม (GIS) และ จัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 500 kV ปลวกแดง สถานีไฟฟ้าแรงสูง 500 kV วังน้อย สำหรับโครงการระบบส่งเพื่อรับซื้อไฟฟ้าจากโรงไฟฟ้าผู้ผลิตไฟฟ้าเอกชนรายใหญ่ โดยทำสัญญาแบบปรับราคาได้ (ค่า k) โดยใช้ขบประมาณ กฟผ.

สถานที่ก่อสร้าง : สถานีไฟฟ้าแรงสูงพนมสารคาม (GIS) สถานีไฟฟ้าแรงสูงปลวกแดง และสถานีไฟฟ้าแรงสูงวังน้อย
ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ) : 1,300,000,000.- บาท

คุณสมบัติของผู้เสนอราคา

1. ต้องเป็นผู้ประกอบการและพัสดุที่ผ่านการคัดเลือกคุณสมบัติเบื้องต้นตามบัญชีรายชื่อที่ระบุในเอกสารประกวดราคา
2. ต้องเป็นนิติบุคคลผู้มีอาชีพรับจ้างตามประกวดราคาจ้างดังกล่าว และต้องไม่เป็นผู้ทำงานซึ่งปลัดกระทรวงการคลังได้แจ้งเวียนชื่อไว้ หรือต้องไม่เป็นผู้ที่ กฟผ. ห้ามติดต่อหรือห้ามเข้าเสนอราคา หรือต้องไม่เป็นผู้ที่ได้รับผลของการสั่งให้นิติบุคคลหรือบุคคลอื่นเป็นผู้ทำงานตามคำสั่ง กฟผ.
3. ต้องไม่เป็นผู้มีผลประโยชน์ร่วมกันกับผู้เสนอราคารายอื่น ณ วันประกาศประกวดราคาครั้งนี้เป็นต้นไป หรือต้องไม่เป็นผู้กระทำการอันเป็นการขัดขวางการแข่งขันราคาอย่างเป็นธรรมในการดำเนินการประกวดราคาครั้งนี้
4. ต้องไม่เป็นที่ปรึกษาของ กฟผ. หรือมีส่วนร่วมในบริษัทที่ปรึกษาของ กฟผ. ในงานนี้ หรือต้องไม่มีผู้ปฏิบัติงาน กฟผ. เข้าไปมีส่วนร่วมในกิจการของผู้เสนอราคา ไม่ว่าจะในฐานะผู้ถือหุ้นที่มีสิทธิควบคุมการจัดการ กรรมการ ผู้อำนวยการ ผู้จัดการ พนักงาน ลูกจ้าง ตัวแทน หรือที่ปรึกษา ยกเว้น ในกรณีที่ผู้ปฏิบัติงานได้รับคำสั่งอย่างเป็นทางการจาก กฟผ. ให้ไปปฏิบัติงานหรือเข้าร่วมในกิจการของผู้เสนอราคา
5. ต้องไม่เป็นผู้ได้รับเอกสิทธิ์หรือความคุ้มกัน ซึ่งอาจปฏิเสธไม่ยอมขึ้นศาลไทย เว้นแต่รัฐบาลของผู้เสนอราคาได้มีคำสั่งให้สละสิทธิ์และความคุ้มกันเช่นนั้น
6. ผู้ประสงค์เข้าประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม (Joint Venture or Consortium) จะต้องดำเนินการทุกขั้นตอนของการประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม ตั้งแต่การเสนอราคาจนสิ้นสุดข้อผูกพันกับ กฟผ.

การขายเอกสารประกวดราคา

ผู้สนใจติดต่อซื้อเอกสารประกวดราคา ในราคาชุดละ 15,000.- บาท ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 26 มกราคม 2567 ถึงวันที่ 26 กุมภาพันธ์ 2567 ทั้งนี้ สามารถดูรายละเอียดการซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ <http://www4.egat.co.th/fprocurement/biddingeng/> หรือสอบถามข้อมูลเพิ่มเติมได้ทางโทรศัพท์ หมายเลข 0 2436 0342 หรืออีเมล procurement.tse@egat.co.th

การยื่นซองประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา **เลื่อนจากวันที่ 3 เมษายน 2567 เป็นวันที่ 18 เมษายน 2567** เวลา 09:30 น. ถึง 10:00 น. และเปิดซองข้อเสนอด้านเทคนิคเวลา 10:00 น. ณ ห้องประกวดราคา ชั้น 1 อาคารฝ่ายจัดซื้อจัดจ้างและบริหารพัสดุ ท.082 การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย เชียงสะพานพระราม 7 จังหวัดนนทบุรี

ประกาศ ณ วันที่ **2 เมษายน 2567**



(นางสาวฉัตติยา จันทนยิ่งยง)

หัวหน้ากองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง

**ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)
ในการจัดซื้อจัดจ้างที่มีในงานก่อสร้าง**

1. ชื่อโครงการ Bid No. IPPP-S-01

การจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500 KV พนมสารคาม (GIS) และจัดซื้อและ
จ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 500 KV ปลวกแดง, สถานีไฟฟ้าแรงสูง 500 KV วังน้อย
โครงการระบบส่งเพื่อรับซื้อไฟฟ้าจากโรงไฟฟ้าผู้ผลิตไฟฟ้าเอกชนรายใหญ่
/หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

2. วงเงินงบประมาณที่ได้รับจัดสรร

โครงการระบบส่งเพื่อรับซื้อไฟฟ้าจากโรงไฟฟ้าผู้ผลิตไฟฟ้าเอกชนรายใหญ่
งบประมาณ 7,985 ล้านบาท

3. วันที่กำหนดราคากลาง 27 ตุลาคม 2566 (วันที่ ชสค. ทำการแทน รวส. อนุมัติ)

ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 1,300,000,000.00 บาท ราคา/หน่วย ตามเอกสารแนบ

4. แหล่งที่มาของราคากลาง

หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานระบบส่ง

5. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง

5.1 นายฉัตรชัย	เชาวนาธิคม	หมฟ-ส. กวอ-ส.
5.2 นายฉัตรชัย	เบญจวงค์รัตน์	หสก-ส. กวอ-ส.
5.3 นายภาณุวัฒน์	ลิขิตผลผดุง	หอด-ส. กวอ-ส.
5.4 นางสาวจากรุวรรณ	พิพัฒน์มงคลพร	หวอ-ส. กวอ-ส.
5.5 นายรุหาญ	รุจิธัญธาร	กวป-ส.
5.6 นายศุภกฤษ	สุจารีรัตน์พงษ์	กวธ-ส.
5.7 นางสาวเอกอุฬาร	เทวารุท	กวส-ส. อรส.

หมายเหตุ ค่าใช้จ่ายอื่นๆ ได้แก่ ค่าใช้จ่ายที่ กฟผ. ต้องจ่ายตามวิธีการพิจารณาเปรียบเทียบราคาที่กำหนดไว้
ในเอกสารประกวดราคา เช่น อกรขาเข้า เป็นต้น

นางสาวเบญญาลักษณ์ ศรีลัมพ์
หจตส-ห.

26 ม.ค. 67

MEDIUM COST FOR BID NO. IPPP-S-01

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS) AND IMPROVEMENT OF 500 KV PLUAK DAENG AND 500 KV WANG NOI SUBSTATIONS
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht			
			Amount	Amount			
1	500 KV PHANOM SAKHAM SUBSTATION (GIS)	THB	601,116,970.78				
				166,285,741.13	308,732,115.40	626,176.23	96,187,701.96
2	500 KV PLUAK DAENG SUBSTATION	THB	14,846,201.85				
				3,778,370.58	10,906,394.57		3,453,069.84
3	500 KV WANG NOI SUBSTATION	THB					
				13,400.64			257,970.98

นางสาวเบญญาลักษณ์ ศรีลัมพ์

ทจตส-ท.

26 ม.ค. 67

นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS) AND IMPROVEMENT OF 500 KV PLUAK DAENG AND 500 KV WANG NOI SUBSTATIONS
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht			
			Amount	Amount			
BID PRICE	THB	615,963,172.63	Baht	Baht	Baht	Baht	Baht
			170,077,512.35	319,638,509.97	626,176.23	99,898,742.78	
OTHER EXPENSES	THB	12,319,263.45	Baht	Baht	Baht	Baht	Baht
VAT	THB		Baht	Baht	Baht	Baht	Baht
		43,979,770.53	11,905,425.86	22,374,695.70	43,832.34	6,992,911.99	
SUMMARY OF BID PRICE	THB	672,262,206.61	Baht	Baht	Baht	Baht	Baht
			181,982,938.21	342,013,205.67	670,008.57	106,891,654.77	
TOTAL MEDIUM COST	THB	1,303,820,013.83					
TOTAL MEDIUM COST (ROUNDED)	THB	1,300,000,000.00					

นางสาวเบญญาลักษณ์ ครลัมภ์

หจตส-ท.

26 ม.ค. 67

นายประวิทย์ เลิศโกวิท


ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง

27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
SCHEDULE 1 : 500 KV PHANOM SAKHAM SUBSTATION (GIS)
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	598,373,058.19	161,299,544.13			96,187,701.96
PART 1C : CIVIL WORK				308,732,115.40		
PART 1D : SUPPLY OF SPARE PARTS	THB	2,743,912.59	4,986,197.00		626,176.23	
TOTAL PRICE	THB	601,116,970.78	Baht	Baht	Baht	Baht
			166,285,741.13	308,732,115.40	626,176.23	96,187,701.96


นางสาวเบญญาลักษณ์ ศรีสัมพันธ์
หจตส-ท.
26 ม.ค. 67


นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB2 : Distribution Transformer			1,469,000.00	146,900.00
Schedule 1AB4 : Surge Arrester	THB	6,765,000.00	1,800,000.00	856,500.00
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	10,152,000.00	2,178,000.00	1,233,000.00
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	554,631,770.00		55,463,177.00


นางสาวเบญญาลักษณ์ ตรีสัมพันธ์
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26 ม.ค. 67


นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB9 : Power Circuit Breaker	THB	13,341,314.00	1,129,970.00	1,447,128.40
Schedule 1AB10 : Disconnecting Switch	THB	4,219,458.00	678,700.00	489,815.80
Schedule 1AB11 : Power Fuse, Fuse Link and Hook Stick	THB	559,356.60		55,935.66
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			3,351,343.00	335,134.30


นางสาวเบญญาลักษณ์ ศรีสัมพันธ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	2,164,457.06	2,105,400.00	426,985.71
Schedule 1AB14 : Substation Steel Structure			26,776,136.92	6,694,034.23
Schedule 1AB15 : Insulator				207,199.30
Schedule 1AB16 : Cable Terminations	THB	142,761.30		35,690.33


นางสาวเบญญาลักษณ์ ศรีลัมพ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB17 : XLPE Power Cable			356,400.00	89,100.00
Schedule 1AB18 : Low Voltage Cable and Conductor			61,857,939.00	15,464,484.75
Schedule 1AB19 : Switchyard Lighting Fixtures			3,340,614.20	835,153.55
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	1,508,802.90		377,200.73


นางสาวเบญญาลักษณ์ ศรีลัมพ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB21 : Bus Fitting	THB	1,407,478.86		351,869.72
Schedule 1AB22 : Grounding Material	THB	1,546,525.17	2,943,216.21	1,122,435.35
Schedule 1AB23 : Substation Miscellaneous	THB	253,740.30	918,177.80	292,979.53
Schedule 1AB24 : Control and Protection System			41,707,522.00	4,546,172.30


นางสาวเบญญาลักษณ์ ศรีลัมภ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB25 : Fault Recording System			4,511,209.00	473,713.90
Schedule 1AB26 : Emergency Generating Set	THB	1,680,394.00		168,039.40
Schedule 1AB33 : CCTV			4,415,706.00	576,799.00
Schedule 1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power			1,315,000.00	100,000.00


นางสาวเบญญาลักษณ์ ศรีสัมพันธ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 1AB35 : Communication Cable			445,210.00	853,350.00
Schedule 1AB38 : Remote Terminal Unit				984,903.00
Schedule 1AB39 : Commissioning	THB			2,560,000.00
PART 1AB	THB	598,373,058.19	Baht	Baht
			161,299,544.13	96,187,701.96


นางสาวเบญญาลักษณ์ ศรีลัมพ์
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นายประวิทย์ เลิศโกวิท
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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MEDIUM COST FOR BID NO. IPPP-S-01
PART 1C : CIVIL WORK
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 1C1 : Foundation Work	16,808,276.00
Schedule 1C2 : Cable Trench	9,161,853.15
Schedule 1C3 : Building	186,805,067.14
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	19,544,449.70
Schedule 1C5 : Water Supply System	1,977,480.00
Schedule 1C6 : Drainage System	17,573,730.75
Schedule 1C7 : Special Construction Works	11,651,118.74
Schedule 1C8 : Miscellaneous	8,872,564.40
Schedule 1C9 : Fire Protection System	36,337,575.52
PART 1C	Baht 308,732,115.40


นางสาวเบญญาลักษณ์ ศรีลัมพ์
จดส-ห.
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นายประวิทย์ เลิศโกวิท
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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MEDIUM COST FOR BID NO. IPPP-S-01
PART 1D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount
Schedule 1D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	1,405,672.00		70,283.60
Schedule 1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	78,852.40		3,942.62
Schedule 1D12 : Spare Parts for AC&DC Distribution Board and Termination Box			144,252.00	7,212.60
Schedule 1D22 : Spare Parts for Grounding Material	THB	1,259,388.19		62,969.41


นางสาวเบญจลักษณ์ ศรีสัมพันธ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 1D : SUPPLY OF SPARE PARTS
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Description	Currency	Supply of Equipment		Local Transportation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1D24 : Spare Parts for Control and Protection System			4,183,112.00	439,378.00
Schedule 1D25 : Spare Parts for Fault Recording System				
			658,833.00	42,390.00
PART 1D	THB	2,743,912.59	Baht	Baht
			4,986,197.00	626,176.23


 นางสาวเบญญาลักษณ์ ครสั้มพ์
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 นายประวิทย์ เลิศโกวิทย์
 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
SCHEDULE 2 : 500 KV PLUAK DAENG SUBSTATION
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	14,846,201.85	3,778,370.58			3,453,069.84
PART 2C : CIVIL WORK				10,906,394.57		
TOTAL PRICE	THB	14,846,201.85	Baht	Baht	Baht	Baht
			3,778,370.58	10,906,394.57		3,453,069.84



นางสาวเบญญาลักษณ์ ศรีลัมพ์
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นายประวิทย์ เลิศโกวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB9 : Power Circuit Breaker	THB	14,471,284.00		1,591,841.24
Schedule 2AB12 : AC&DC Distribution Board and Termination Box			38,046.00	4,185.06
Schedule 2AB14 : Substation Steel Structure			11,020.40	3,030.61
Schedule 2AB18 : Low Voltage Cable and Conductor			2,847,264.00	652,498.00
Schedule 2AB21 : Bus Fitting	THB	301,047.43		68,990.04


นางสาวเบญจลักษณ์ ตรีสัมพันธ์
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นายประวิทย์ เลิศไกรวิทย์
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB22 : Grounding Material	THB	73,870.42	131,380.58	47,036.69
Schedule 2AB23 : Substation Miscellaneous			89,337.60	20,473.20
Schedule 2AB24 : Control and Protection System			661,322.00	689,415.00
Schedule 2AB25 : Fault Recording System				11,800.00
Schedule 2AB38 : Remote Terminal Unit				11,800.00

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นางสาวเบญญาลักษณ์ ศรีสัมพันธ์
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[Signature]
นายประวิทย์ เลิศโกวิท
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB39 : Commissioning	THB			352,000.00
PART 2AB	THB	14,846,201.85	Baht	Baht
			3,778,370.58	3,453,069.84




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MEDIUM COST FOR BID NO. IPPP-S-01
PART 2C : CIVIL WORK
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 2C1 : Foundation Work	1,675,594.00
Schedule 2C2 : Cable Trench	1,003,731.50
Schedule 2C4 : Earth Work, Road and Crushed Rock Surfacing	70,605.50
Schedule 2C6 : Drainage System	1,768,321.50
Schedule 2C7 : Special Construction Works	656,077.27
Schedule 2C9 : Fire Protection System	5,732,064.80
PART 2C	Baht 10,906,394.57



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MEDIUM COST FOR BID NO. IPPP-S-01
SCHEDULE 3 : 500 KV WANG NOI SUBSTATION
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB		13,400.64			257,970.98
TOTAL PRICE	THB		Baht 13,400.64	Baht	Baht	Baht 257,970.98


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MEDIUM COST FOR BID NO. IPPP-S-01
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB23 : Substation Miscellaneous			13,400.64	3,070.98
Schedule 3AB24 : Control and Protection System				96,000.00
Schedule 3AB25 : Fault Recording System				11,800.00


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PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB38 : Remote Terminal Unit				11,800.00
Schedule 3AB39 : Commissioning				135,300.00
	THB			
PART 3AB	THB	Baht	13,400.64	Baht 257,970.98


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB2 : Distribution Transformer

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB2-1	500 kVA, 22000-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX2702	1					1,055,000.00	1,055,000.00	XXXXXX	XXXXXX		
1AB2-2	100 kVA, 400-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX0306	1					414,000.00	414,000.00	XXXXXX	XXXXXX		
1AB2-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB2-1 thru 1AB2-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	146,900.00	146,900.00		
Total Price for Schedule 1AB2									Baht	1,469,000.00	Baht	146,900.00

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB4 : Surge Arrester

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB4-1	396 kV Surge Arrester completed with corona ring, grading ring as per Ratings and Features RF SA9Y11	18		THB	366,000.00	6,588,000.00			XXXXX	XXXXX		
1AB4-2	21 kV Surge Arrester as per Ratings and Features RF SA2Y01	3		THB	59,000.00	177,000.00			XXXXX	XXXXX		
1AB4-3	Steel Supporting Structure for SA9Y11 (for Item No. 1AB4-1), H=9.00 m as per Dwg. No. ST-LA-9-01 and SD-AB-0-01	18					100,000.00	1,800,000.00	XXXXX	XXXXX		
1AB4-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB4-1 thru 1AB4-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	856,500.00	856,500.00		
				THB	6,765,000.00		Baht		Baht			
Total Price for Schedule 1AB4							1,800,000.00		856,500.00			

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MEDIUM COST FOR BID NO. IPPP-S-01

**1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB6-1	525 kV CCVT, 1550 kV BIL, 287500:115/63.9&115/63.9&115/63.9 V with carrier accessories, oil filled as per Ratings and Features RF PD9W11	18		THB	564,000.00	10,152,000.00			XXXXXX	XXXXXX		
1AB6-2	Steel Supporting Structure for PD9W11 (for Item No. 1AB6-1), H=9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	18					106,000.00	1,908,000.00	XXXXXX	XXXXXX		
1AB6-3	Junction Box type PT7 (for Item No. 1AB6-1) as per Dwg. No. TP-E-18.1 sh.3/4, TP-E-18.4 and TP-E-.18.5	6					45,000.00	270,000.00	XXXXXX	XXXXXX		
1AB6-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB6-1 thru 1AB6-3		Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	1,233,000.00	1,233,000.00		
				THB	10,152,000.00		Baht		Baht			
Total Price for Schedule 1AB6							2,178,000.00		1,233,000.00			


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MEDIUM COST FOR BID NO. IPPP-S-01


1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-1	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02 (Line No.1 to Wang Noi)	1		THB	110,926,354.00	110,926,354.00	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB7-2	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02 (Line No.2 to Wang Noi and Line No.1 to Burapa Power)	1		THB	166,389,531.00	166,389,531.00	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB7-3	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02 (Line No.2 to Burapa Power and Line No.2 to Pluak Daeng)	1		THB	166,389,531.00	166,389,531.00	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB7-4	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02 (Line No.1 to Pluak Daeng)	1		THB	110,926,354.00	110,926,354.00	XXXXXX	XXXXXX	XXXXXX	XXXXXX		


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MEDIUM COST FOR BID NO. IPPP-S-01
1AB7 : SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB7-5	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB7-6	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) outdoor type (GIB) as per Drawing No. PSK-S-1-01/01, PSK-S-2-01/01 and TYP1A-S-3-01/02	1	lot	THB	included	included	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB7-7	Local control cubicle for IS9450 for item 1AB7-1 thru 1AB7-6*	10		THB	included	included			XXXXXX	XXXXXX		
1AB7-8	Steel Supporting Structure for IS9450*	1	lot	THB	included	included			XXXXXX	XXXXXX		
1AB7-9	Removable service platform and removable ladder for GIS inspection	1	lot	THB	included	included			XXXXXX	XXXXXX		

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

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Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-10	Cost of Local Transportation, Construction and Installation for Item No. 1AB7-1 thru 1AB7-9			THB	XXXXX	XXXXX	XXXXX	XXXXX	55,463,177.00	55,463,177.00		
	Note : The SF6 gas in a quantity equivalent to 115% of the total equipment actual requirement shall be provided as follows: - 100% of SF6 gas quantity shall be shipped in returnable steel bottles which shall be returned back to Contractor. - 15% of SF6 gas quantity shall be shipped in non-returnable steel bottles which shall become the property of EGAT.											
Total Price for Schedule 1AB7				THB	554,631,770.00		Baht		55,463,177.00			

* The design of supporting structures and LCCs for Gas Insulated Switchgear shall be verified by Gas Insulated Switchgear manufacturer.

MEDIUM COST FOR BID NO. IPPP-S-01

1AB9 : Power Circuit Breaker

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB9-1	550 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 70 MVar Y-connected five-limbed core type shunt reactor with 110 kV 0.55 Mvar neutral reactor with earthed neutral)	2		THB	5,576,295.00	11,152,590.00			XXXXXX	XXXXXX		
1AB9-2	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with two Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 1AB9-1	1		THB	1,860,316.00	1,860,316.00			XXXXXX	XXXXXX		
1AB9-3	Circuit breaker marshalling KIOSK (Designed by Contractor)	2					564,985.00	1,129,970.00	XXXXXX	XXXXXX		
1AB9-4	Steel Supporting Structure for CB995R(IEC) (Item No. 1AB9-1)*	2		THB	164,204.00	328,408.00			XXXXXX	XXXXXX		

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB9 : Power Circuit Breaker

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB9-5	Cost of Local Transportation, Construction and Installation for Item No. 1AB9-1 thru 1AB9-4											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,447,128.40	1,447,128.40		
Total Price for Schedule 1AB9				THB	13,341,314.00		Baht	1,129,970.00		Baht	1,447,128.40	

*The design of supporting structures of circuit breaker shall be verified by circuit breaker manufacturer.


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB10 : Disconnecting Switch

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB10-1	550 kV 4000 A air switch with grounding blade (high creepage) motor operated as per Ratings and Features RF DS99KI(IEC) (phase spacing = 7.50 m)	2		THB	2,109,729.00	4,219,458.00			XXXXX	XXXXX		
1AB10-2	Steel Supporting Structure for DS99KI as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m (with earth fix point on both sides)	2					339,350.00	678,700.00	XXXXX	XXXXX		
1AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB10-1 thru 1AB10-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	489,815.80	489,815.80		
				THB	4,219,458.00		Baht		Baht			
							678,700.00		489,815.80			
Total Price for Schedule 1AB10												

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB11 : Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB11-1	22 kV 100 A 12.5 kA 1-pole dropout fuse as per Ratings and Features RF PF2111 (Not including fuse link or refill unit)	3		THB	170,974.10	512,922.30			XXXXXX	XXXXXX		
1AB11-2	Fuse link or refill unit 20E for 22 kV power fuse (standard speed)	3		THB	15,478.10	46,434.30			XXXXXX	XXXXXX		
1AB11-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB11-1 thru 1AB11-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	55,935.66	55,935.66		
Total Price for Schedule 1AB11				THB	559,356.60		Baht		Baht 55,935.66			


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB12 : AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-1	400/230 Vac Load Center Unit Substation (LCUS) as per Dwg. No. SE-LCUS-0-01, TYP1-L-5-01-01 and PSK-L-5-01-01 and Ratings and Features RF No. LVCB (Designed by Contractor)	1					850,440.00	850,440.00	XXXXX	XXXXX		
1AB12-2	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					92,148.00	92,148.00	XXXXX	XXXXX		
1AB12-3	Safety switch 600 Vac 800 A, 4 wire, solid neutral (S/N), 3 blades, 3 fuses time lag type, outdoor NEMA 4X enclosure or higher, completed with 800 A fuses. The terminal lug shall be suitable for - incoming cable size of 6x240 sq.mm phase wire and 2x240 sq.mm neutral wire. - outgoing cable size of 6x240 sq.mm phase wire and 2x240 sq.mm neutral wire.	1					201,593.00	201,593.00	XXXXX	XXXXX		
1AB12-4	Termination Box type TB1 as per Dwg No. LT-TB-0-01	8					3,236.00	25,888.00	XXXXX	XXXXX		
1AB12-5	Outdoor Receptacle Box type ORB1 as per Dwg. No. SE-ORB-0-01	1					22,965.00	22,965.00	XXXXX	XXXXX		

MEDIUM COST FOR BID NO. IPPP-S-01
1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-6	Outdoor Receptacle Box type ORB2 as per Dwg. No. SE-ORB-0-01	1						38,046.00	38,046.00	XXXXXX	XXXXXX	
1AB12-7	22kV 100A 12.5kA Load break switch with Cable Termination as per Ratings and Features RF LB2110 Manually operate, 3 phase, outdoor type with cable termination suitable for - incoming cable size of 3x35 sq.mm, 22 kV XLPE Cable, 1 hole NEMA Pad - outgoing cable size of 3x35 sq.mm, 22 kV XLPE Cable, 1 hole NEMA Pad	1						589,828.00	589,828.00	XXXXXX	XXXXXX	
1AB12-8	Molded Case Selector Switch 125Vdc as per Dwg. No. SE-MSS-0-01	1						50,580.00	50,580.00	XXXXXX	XXXXXX	
1AB12-9	Power Box No. 1A (PRB-1A) as per Dwg. No. PSK-L-3-01/02 and LT-EQ-0-01 (Designed by Contractor)	1						60,815.00	60,815.00	XXXXXX	XXXXXX	

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 นายประวิทย์ เลิศโกวิทย์
 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB12-10	Power Box No. 1B (PRB-1B) as per Dwg. No. PSK-L-3-01/02 and LT-EQ-0-01 (Designed by Contractor)	1					60,815.00	60,815.00	XXXXXX	XXXXXX		
1AB12-11	Power Box No. 2 (PRB-2) as per Dwg. No. PSK-L-3-01/02 and LT-EQ-0-01 (Designed by Contractor)	1					60,815.00	60,815.00	XXXXXX	XXXXXX		
1AB12-12	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	1					195,405.00	195,405.00	XXXXXX	XXXXXX		
1AB12-13	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For GIS, designed by Contractor)	1					195,405.00	195,405.00	XXXXXX	XXXXXX		
1AB12-14	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	2					156,690.00	313,380.00	XXXXXX	XXXXXX		


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1AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-15	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	2					148,305.00	296,610.00	XXXXX	XXXXX		
1AB12-16	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For GIS, designed by Contractor)	2					148,305.00	296,610.00	XXXXX	XXXXX		
1AB12-17	Cost of Local Transportation, Construction and Installation for Item No. 1AB12-1 thru 1AB12-16											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	335,134.30	335,134.30		
Total Price for Schedule 1AB12							Baht 3,351,343.00		Baht 335,134.30			



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MEDIUM COST FOR BID NO. IPPP-S-01
1AB13 : Stationary Battery and Battery Charger
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (Design by Contractor)											
1AB13-1a	a) Battery	2	set	THB	997,700.00	1,995,400.00			XXXXX	XXXXX		
1AB13-1b	b) Electrolyte	2	set	THB	28,691.15	57,382.30			XXXXX	XXXXX		
1AB13-1c	c) Battery Rack	2	set	THB	55,837.38	111,674.76			XXXXX	XXXXX		
1AB13-2	125 Vdc battery charger having sufficient rated DC output current, but not less than 15 % of associated battery 8 hour drainage rate, complete with all accessories as per Specification attached	3					701,800.00	2,105,400.00	XXXXX	XXXXX		
1AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB13-1 thru 1AB13-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	426,985.71	426,985.71		
Total Price for Schedule 1AB13												
				THB	2,164,457.06		Baht		2,105,400.00			
							2,105,400.00		426,985.71			


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MEDIUM COST FOR BID NO. IPPP-S-01


1AB14 : Substation Steel Structure

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-1	500 kV take-off structure (B1) as per Dwg. No. ST-1-01/01	7						1,875,871.84	13,131,102.88	XXXXX	XXXXX	
1AB14-2	500 kV beam (B1-2) as per Dwg. No. ST-1-01/01	6						2,048,691.69	12,292,150.14	XXXXX	XXXXX	
1AB14-3	500 kV bus pole structure (BP901) as per Dwg. No. ST-BP-9-01	6						94,404.72	566,428.32	XXXXX	XXXXX	
1AB14-4	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	6						12,523.18	75,139.08	XXXXX	XXXXX	
1AB14-5	Telecommunication Tower Type WSA (H = 30.00 m) as per Dwg. No. UWC-06-WSA-501,502,503&504	1						520,964.19	520,964.19	XXXXX	XXXXX	
1AB14-6	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	3						11,020.40	33,061.20	XXXXX	XXXXX	
1AB14-7	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	2						8,515.76	17,031.52	XXXXX	XXXXX	


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB14 : Substation Steel Structure

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-8	Overhead ground wire structure (OS1)as per Dwg. No. RS-TE106-C4.8	1						140,259.59	140,259.59	XXXXX	XXXXX	
1AB14-9	Cost of Local Transportation, Construction and Installation for Item No. 1AB14-1 thru 1AB14-8	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	6,694,034.23	6,694,034.23	
Total Price for Schedule 1AB14								Baht	26,776,136.92	Baht	6,694,034.23	



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MEDIUM COST FOR BID NO. IPPP-S-01

1AB15 : Insulator

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB15-1	Suspension insulator fog type (17" minimum leakage distance and 36,000 lb minimum combined M&E strength) as per Specification attached. (For 500kV insulator assembly, 28 units per string consisting of 26 brown-glazed discs and 2 light gray-glazed discs)	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB15-2	Suspension insulator ANSI 52-3 as per Specification attached	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB15-3	500 kV station post insulator ANSI TR. No. 391, high creepage distance of not less than 13,750 mm. as per Specification attached	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB15-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB15-1 thru 1AB15-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	207,199.30	207,199.30		
Total Price for Schedule 1AB15							Baht	Baht	207,199.30			


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB16 : Cable Terminations

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB16-1	22 kV cable terminations for 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF TN212H	6		THB	6,614.30	39,685.80			XXXXX	XXXXX		
1AB16-2	Cable Cleats with necessary miscellaneous hardware for Item No. 1AB17-1 trefoil formation 3-phase per set as per Ratings and Features RF TNAC1 (Design by Contractor)	Lump sum	Lump sum	THB	96,888.00	96,888.00			XXXXX	XXXXX		
1AB16-3	Cable Cleats with necessary miscellaneous hardware for Item No. 1AB17-1 flat formation 1-phase per set as per Ratings and Features RF TNAC1 (Design by Contractor)	Lump sum	Lump sum	THB	6,187.50	6,187.50			XXXXX	XXXXX		
1AB16-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB16-1 thru 1AB16-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	35,690.33	35,690.33		
				THB	142,761.30		Baht		Baht			
Total Price for Schedule 1AB16									35,690.33			

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB17 : XLPE Power Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB17-1	22 kV 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF PC2110											
		Lump sum	Lump sum					356,400.00	356,400.00	XXXXX	XXXXX	
1AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB17-1											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	89,100.00	89,100.00	
Total Price for Schedule 1AB17									Baht	356,400.00	Baht	89,100.00

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB18 : Low Voltage Cable and Conductor
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				12,064,690.00	12,064,690.00	XXXXX	XXXXX		
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				33,615,450.00	33,615,450.00	XXXXX	XXXXX		
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				58,410.00	58,410.00	XXXXX	XXXXX		
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				2,300,485.00	2,300,485.00	XXXXX	XXXXX		
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				13,484,130.00	13,484,130.00	XXXXX	XXXXX		
1AB18-6	Overhead ground wire as per Specification attached	Lump sum	Lump sum				4,774.00	4,774.00	XXXXX	XXXXX		
1AB18-7	Aluminum conductor as per Specification attached	Lump sum	Lump sum				330,000.00	330,000.00	XXXXX	XXXXX		
1AB18-8	Cost of Local Transportation, Construction and Installation for Item No. 1AB18-1 thru 1AB18-7	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	15,464,484.75	15,464,484.75	
Total Price for Schedule 1AB18							Baht		Baht			
							61,857,939.00		15,464,484.75			


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB19 : Switchyard Lighting Fixtures

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	16						13,505.80	216,092.80	XXXXX	XXXXX	
1AB19-2	Street lighting fixture, LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	91						13,505.80	1,229,027.80	XXXXX	XXXXX	
1AB19-3	Tapered galvanized steel lamp post H=5000 mm. complete with 5 A 250 V plug fuse, 20 A 500 V terminal block for accepting 4 sq.mm. of incoming and outgoing cables and anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	91						20,829.60	1,895,493.60	XXXXX	XXXXX	
1AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB19-1 thru 1AB19-3											
		Lump sum	Lump sum					XXXXX	XXXXX	XXXXX	XXXXX	
Total Price for Schedule 1AB19									Baht	3,340,614.20	Baht	835,153.55

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB20-1	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	794,455.20	794,455.20			XXXXX	XXXXX
1AB20-2	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	714,347.70	714,347.70			XXXXX	XXXXX
1AB20-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB20-1 thru 1AB20-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	377,200.73	377,200.73
Total Price for Schedule 1AB20				THB	1,508,802.90		Baht		Baht 377,200.73	

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB21 : Bus Fitting

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	1,407,478.86	1,407,478.86			XXXXX	XXXXX		
1AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	351,869.72	351,869.72		
Total Price for Schedule 1AB21				THB	1,407,478.86		Baht		Baht 351,869.72			



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MEDIUM COST FOR BID NO. IPPP-S-01

1AB22 : Grounding Material

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	353,812.20	353,812.20			XXXXX	XXXXX		
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				2,870,832.63	2,870,832.63	XXXXX	XXXXX		
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	679,062.48	679,062.48			XXXXX	XXXXX		
1AB22-4	Disconnecting switch safety Mats	6					12,063.93	72,383.58	XXXXX	XXXXX		
1AB22-5	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	513,650.49	513,650.49			XXXXX	XXXXX		
1AB22-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB22-1 thru 1AB22-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,122,435.35	1,122,435.35		
Total Price for Schedule 1AB22				THB	1,546,525.17		Baht		Baht			
							2,943,216.21		1,122,435.35			

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB23-1	Rigid steel conduit as per Specification attached							204,377.80	204,377.80	XXXXX	XXXXX	
		Lump sum	Lump sum									
1AB23-2	Fitting for rigid steel conduit as per Specification attached			THB	178,167.00	178,167.00				XXXXX	XXXXX	
		Lump sum	Lump sum									
1AB23-3	HDPE conduit and fitting as per Specification attached							181,560.00	181,560.00	XXXXX	XXXXX	
		Lump sum	Lump sum									
1AB23-4	Heat shrinkable insulation material as per Specification attached			THB	75,573.30	75,573.30				XXXXX	XXXXX	
		Lump sum	Lump sum									
1AB23-5	Identification and danger notice plate as per drawing attached							372,240.00	372,240.00	XXXXX	XXXXX	
		Lump sum	Lump sum									
1AB23-6	22 kV Power Supply for Station service, Miscellaneous hardware and Concrete pole as per Dwg. No. PSK-L-3 and PSK-L-5							160,000.00	160,000.00	XXXXX	XXXXX	
		Lump sum	Lump sum									

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB23-7	Cost of Local Transportation, Construction and Installation for Item No. 1AB23-1 thru 1AB23-6											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	292,979.53	292,979.53		
Total Price for Schedule 1AB23				THB	253,740.30		Baht	918,177.80		Baht	292,979.53	

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-1	500 KV BUS PROTECTION (LOW IMPEDANCE, 8 FEEDERS)	Panel Nos.1R, 2R, 3R, 4R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	4	SET				1,393,484.00	5,573,936.00	XXXXXX	XXXXXX		
1AB24-2	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos.5R, 8R, 15R, 17R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	4	EA				1,708,524.00	6,834,096.00	XXXXXX	XXXXXX		
1AB24-3	500 kV LINE PROTECTION (21P, 24L, 2-BF)	Panel Nos.6R, 9R, 16R, 18R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	4	EA				1,993,419.00	7,973,676.00	XXXXXX	XXXXXX		



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MEDIUM COST FOR BID NO. IPPP-S-01
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-4	500 kV SHUNT REACTOR PROTECTION	Panel Nos.7R, 10R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	2	EA				2,556,654.00	5,113,308.00	XXXXX	XXXXX		
1AB24-5	500 kV LINE PROTECTION (87L, 79, 51S)	Panel Nos.11R, 13R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	2	EA				1,809,858.00	3,619,716.00	XXXXX	XXXXX		
1AB24-6	500 kV LINE PROTECTION (21P, 24L, 1-BF)	Panel Nos.12R, 14R Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	2	EA				1,666,424.00	3,332,848.00	XXXXX	XXXXX		



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1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-7	INTERPOSING PANEL TYPE IP7	Panel Nos.IP1, IP2 and IP3 Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3, TP-E-10.2 and TP-E-6.4 sh.1-6, Spec no. 1005, Scope of work	3	EA				1,202,970.00	3,608,910.00	XXXXX	XXXXX		
1AB24-8	MARSHALLING PANEL FOR TELEPROTECTION (500 kV)	Panel Nos.MP-TELE1 and MP-TELE2 Drawing Nos.PSK-E-1, DW-TPS-D01-120-01 sh.P01-P11, Spec no. 1005, Scope of work	2	EA				613,392.00	1,226,784.00	XXXXX	XXXXX		
1AB24-9	MARSHALLING PANEL FOR RTU	Panel Nos.MP-RTU1, MP-RTU2 and MP-RTU3 Drawing Nos.PSK-E-1, TP-E-10.3, Spec no. 1005, Scope of work	3	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX		


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MEDIUM COST FOR BID NO. IPPP-S-01
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-10	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel Nos.MPC1 and MPC2 Drawing Nos.PSK-E-1, TP-E-10.3, Spec no. 1005, Scope of work	2	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXXX	XXXXXX		
1AB24-11	MARSHALLING PANEL FOR FRS	Panel Nos.MP-FRS1 Drawing Nos.PSK-E-1, TP-E-10.3, Spec no. 1005, Scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXXX	XXXXXX		
1AB24-12	TRANSDUCER PANEL	Panel No.TDR1 included 8-V-TDR 1ph, 6-TS, 6-W&VAR TDR, 2-DC-TDR(125VDC), 1-DC-TDR(48VDC), 2-AC-TDR, 2-T-TDR, 2-F-TDR (each AC-TDR & T-TDR are installed in Control room and GIS building respectively) Drawing Nos.PSK-E-1 and TP-E-10.2, Spec no. 1005, Scope of work	1	EA				1,238,862.00	1,238,862.00	XXXXXX	XXXXXX		

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB24-13	SYNCHRONIZING PANEL FOR 14 BREAKERS OF BREAKER AND A HALF	Panel No.S1 Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	1	EA				705,385.00	705,385.00	XXXXX	XXXXX		
1AB24-14	GPS RECEIVER PANEL	Panel No.GPS Receiver Drawing Nos.PSK-E-2 and TP-E-10.15 Spec. No. 1005 and SD-FOT-P22. See scope of work	1	EA				697,555.00	697,555.00	XXXXX	XXXXX		
1AB24-15	500 kV TRIP CIRCUIT SUPERVISION (6-BKR)	Panel Nos.TCS1 and TCS2 Drawing Nos.PSK-E-1, PSK-E-2, PSK-E-3 and TP-E-10.1, Spec no. 1005, Scope of work	2	EA				891,223.00	1,782,446.00	XXXXX	XXXXX		


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MEDIUM COST FOR BID NO. IPPP-S-01
1AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-16	Cost of Local Transportation, Construction and Installation for Item No.1AB24-1 thru 1AB24-15	See scope of work	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	4,546,172.30	4,546,172.30
Total Price for Schedule 1AB24								Baht	41,707,522.00	Baht	4,546,172.30


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MEDIUM COST FOR BID NO. IPPP-S-01
1AB25 : Fault Recording System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB25-1	FAULT RECORDING SYSTEM, 64 ANALOG INPUT, 320 DIGITAL INPUT.	Installed in 500kV Control building. Drawing Nos.PSK-E-1 and TP-E-10.2, Spec no. 1003, Scope of work	1	SET					4,511,209.00	4,511,209.00	XXXXXX	XXXXXX	
1AB25-2	Cost of Local Transportation, Construction and Installation for Item No.1AB25-1	See scope of work	Lump sum	Lump sum					XXXXXX	XXXXXX	473,713.90	473,713.90	
Total Price for Schedule 1AB25											Baht	Baht	
											4,511,209.00	473,713.90	


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MEDIUM COST FOR BID NO. IPPP-S-01

1AB26 : Emergency Generating Set

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB26-1	200 kVA, 400/230 V Emergency Generating set 3-Phase as per Ratings and Features RF EGS200 with Automatic Transfer Switch (ATS) 3 Phase 4 W. 400/230 V 250 A	1		THB	1,680,394.00	1,680,394.00	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
1AB26-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB26-1			THB	XXXXXX	XXXXXX	XXXXXX	XXXXXX	168,039.40	168,039.40		
				THB	1,680,394.00		Baht		Baht			
Total Price for Schedule 1AB26									168,039.40			

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Dr. Gao
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MEDIUM COST FOR BID NO. IPPP-S-01

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

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Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB33-1	CCTV System and accessories including:	1	SET					4,415,706.00	4,415,706.00	XXXXXX	XXXXXX	
	(1) Outdoor PTZ Dome Camera (2 EA)											
	(2) Indoor Fixed Camera (13 EA)											
	(3) Outdoor Fixed Camera (27 EA)											
	(4) PC Workstation (1 EA)											
	(5) Server (1 EA)											
	(6) Software license											
	(6.1) Software management license (1 License)											
	(6.2) Redording license (42 Licenses)											
	(6.3) Video analytic license (42 Licenses)											
	(7) Ethernet I/O Module (1 EA)											
	(8) Monitor (6 EA)											
	(9) HDMI Optical Extender (3 SET)											
	(10) LAN Switch (2 EA)											
	(11) CCTV Rack Cabinet (1 EA)											
	(12) CCTV steel box/ End-point steel box (Lumpsum)											
	(13) Monitoring Desk (1 EA)											
	(14) PoE Injector for Fixed camera (40 EA)											
	(15) Adapter for PTZ camera (2 EA)											
	(16) CCTV Pole 2 meter (Lumpsum)											

MEDIUM COST FOR BID NO. IPPP-S-01

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
(17) CCTV Pole 4 meter (Lumpsum)												
(18) Indoor-type twisted pair cable (Lumpsum)												
(19) Outdoor-type twisted pair cable (Lumpsum)												
(20) 12-core ADSS Optical Fiber Cable (Lumpsum)												
(21) Media Converter (UTP-Fiber Optic) (64 EA)												
(22) Surge protection-220VAC (14 SET)												
(23) Line Filter (14 EA)												
(24) Electrical cable (Lumpsum)												
(25) EMT couduit (Lumpsum)												
(26) IMC, Flexible conduit with PVC coating (Lumpsum)												
(27) Eflex/HDPE (Lumpsum)												
(28) Ground System (Lumpsum)												
(29) Accessories (Lumpsum)												

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MEDIUM COST FOR BID NO. IPPP-S-01

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB33-2	Cost of Local Transportation, Construction and Installation for Item no. 1AB33-1	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	576,799.00	576,799.00		
	<p>IMPORTANT :</p> <p>1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration.</p> <p>2. Telecommunication Equipment supplied under Schedule 1AB33 shall conform to Specification No. SD-CCTV-P01, Drawing No. DW-COM-D01-007-ALL and DW-CAB-D01-019</p>											
Total Price for Schedule 1AB33							Baht 4,415,706.00		Baht 576,799.00			

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MEDIUM COST FOR BID NO. IPPP-S-01
1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB34-1	Vented Type Lead-Acid Station Battery 48Vdc. with capacity not less than 600Ah (Tubular plate) at 10 Hour rated, 24 Cells,Nominal Voltage 2Volts/Cell, with Rack 1 set (500 kV GIS BUILDING at PSK)	1	SET				365,000.00	365,000.00	xxxxx	xxxxx
1AB34-2	Conventional Type Charger 48VDC, 150A. (500 kV GIS BUILDING at PSK)	2	SET				400,000.00	800,000.00	xxxxx	xxxxx
1AB34-3	48VDC. Load center Type1: 60 Breaker (500 kV GIS BUILDING at PSK)	1	SET				150,000.00	150,000.00	xxxxx	xxxxx
1AB34-4	Local Transportation, Construction and Installation for item 1AB34-1, 1AB34-2 and 1AB34-3	1	JOB		xxxxx	xxxxx	xxxxx	xxxxx	100,000.00	100,000.00
Total Price for Schedule 1AB34							Baht 1,315,000.00		Baht 100,000.00	


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 27 Oct 2023


MEDIUM COST FOR BID NO. IPPP-S-01


1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-1	Optical Fiber Cable from fiber frame termination cabinet at Phanom Sarakham 500kV Control Building to joint box at 500 kV Burapa Power Generation Power Plant Line 1 take-off structure											
1AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 300 meters) (b) Rigid steel conduit from take-off structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (d) Rack cabinet and accessories (Phanom Sarakham 500kV Control Building - 1 set) (e) Fiber frame termination cabinet with cable tray (Phanom Sarakham 500kV Control Building - 1 set) (f) 36 Pigtails (1.5 meters) (Phanom Sarakham 500kV Control Building - 1 set) (g) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (h) 2-way joint box and accessories for optical fiber cable at take-off structure (1 set)	1	LOT				111,780.00	111,780.00	XXXXXX	XXXXXX		
1AB35-1.2	Local transportation, Construction and Installation for item 1AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	209,840.00	209,840.00		


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023


MEDIUM COST FOR BID NO. IPPP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-2	Optical Fiber Cable from fiber frame termination cabinet at Phanom Sarakham 500kV Control Building to joint box at 500 kV Burapa Power Generation Power Plant Line 2 take-off structure											
1AB35-2.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx.250 meters) (b) Rigid steel conduit from take-off structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (d) Fiber frame termination cabinet with cable tray (Phanom Sarakham 500kV Control Building - 1 set) (e) 36 Pigtails (1.5 meters) (Phanom Sarakham 500kV Control Building - 1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box and accessories for optical fiber cable at take-off structure (1 set)	1	LOT				114,810.00	114,810.00	XXXXX	XXXXX		
1AB35-2.2	Local transportation, Construction and Installation for item 1AB35-2.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	220,170.00	220,170.00		


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27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-3	Optical Fiber Cable from fiber frame termination cabinet at Phanom Sarakham 500kV Control Building to joint box at 500 kV Wang Noi take-off structure											
1AB35-3.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx.200 meters) (b) Rigid steel conduit from take-off structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (d) Fiber frame termination cabinet with cable tray (Phanom Sarakham 500kV Control Building - 1 set) (e) 36 Pigtails (1.5 meters) (Phanom Sarakham 500kV Control Building - 1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box and accessories for optical fiber cable at take-off structure (1 set)	1	LOT				92,810.00	92,810.00	XXXXX	XXXXX		
1AB35-3.2	Local transportation, Construction and Installation for item 1AB35-3.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	186,170.00	186,170.00		


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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023


MEDIUM COST FOR BID NO. IPPP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB35-4	Optical Fiber Cable from fiber frame termination cabinet at Phanom Sarakham 500kV Control Building to joint box at 500 kV Pluak Daeng take-off structure											
1AB35-4.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx.350 meters) (b) Rigid steel conduit from take-off structure to cable trench (lump sum) (c) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (d) Fiber frame termination cabinet with cable tray (Phanom Sarakham 500kV Control Building - 1 set) (e) 36 Pigtails (1.5 meters) (Phanom Sarakham 500kV Control Building - 1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box and accessories for optical fiber cable at take-off structure (1 set)	1	LOT				125,810.00	125,810.00	XXXXX	XXXXX		
1AB35-4.2	Local transportation, Construction and Installation for item 1AB35-4.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	237,170.00	237,170.00		


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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
	<p>IMPORTANT:</p> <p>1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification: Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22).</p> <p>2. The Bidder is required to later break down the unit price for sub-items of this Schedule for consideration.</p>											
Total Price for Schedule 1AB35								Baht		Baht		
								445,210.00		853,350.00		



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MEDIUM COST FOR BID NO. IPPP-S-01

1AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht					
						Foreign Supply		Local Supply							
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount						
1AB38-1	DESIGN AND INSTALLATION OF EGAT'S APPLICATION SOFTWARE	Scope of work, Drawing Nos.PSK-E-1	1	SET		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX				
1AB38-2	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	Installed in 500kV Control building. Scope of work	1	SET		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX				
1AB38-3	EGAT RTU TYPE 621M	Installed in 500kV Control building. Scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX				
1AB38-4	EGAT RTU TYPE 621	Installed in 500kV Control building. Scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX				
1AB38-5	EGAT RTU TYPE 16D	Installed in 500kV Control building. Scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX				
1AB38-6	Cost of Local Transportation, Construction and Installation for Item No.1AB38-1 thru 1AB38-5	See scope of work	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	984,903.00	984,903.00				
Total Price for Schedule 1AB38								Baht		Baht					
										984,903.00					


MEDIUM COST FOR BID NO. IPPP-S-01

1AB39 : Commissioning

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB39-1	Commissioning	Lump Sum	Lump Sum	THB	XXXXX	XXXXX	XXXXX	XXXXX	2,560,000.00	2,560,000.00
				THB			Baht	Baht		
Total Price for Schedule 1AB39								2,560,000.00		


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 27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-1	500 kV Take off structure foundation (TS901) pad type	Designed by Contractor, SH/BSP2-FD-TS-9-01 01/01, See Scope of work	3	set	815,483.00	2,446,449.00
1C1-2	500 kV Take off structure foundation (TS901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-TS-9-01 01/01, SD-PL-0-01, See Scope of work	4	set	628,280.00	2,513,120.00
1C1-3	500 kV Power circuit breaker foundation (CB901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-CB-9-01 01/01, SD-PL-0-01, See Scope of work	2	set	149,135.00	298,270.00
1C1-4	500 kV Disconnecting switch foundation (DS901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-DS-9-01 01/01, SD-PL-0-01, See Scope of work	2	set	217,500.00	435,000.00
1C1-5	500 kV Voltage transformer support structure foundation (VT901) pad type	Designed by Contractor, SH/BSP2-FD-VT-9-01 01/01, See Scope of work	6	set	44,241.00	265,446.00

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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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MEDIUM COST FOR BID NO. IPPP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-6	500 kV CCVT foundation (VT901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-GE-9-01 01/01, SD-PL-0-01, See Scope of work	12	set	33,301.00	399,612.00
1C1-7	500 kV Bus pole structure foundation (BP901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-BP-9-01 01/01, SD-PL-0-01, See Scope of work	3	set	42,252.00	126,756.00
1C1-8	500 kV Surge arrester structure foundation (SA901) pad type	Designed by Contractor, SH/BSP2-FD-SA-9-02 01/01, See Scope of work	6	set	44,288.00	265,728.00
1C1-9	500 kV Lightning arrester support structure foundation (LA901) Pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, KEC/PDG-FD-GE-9-01 01/01, SD-PL-0-01, See Scope of work	12	set	33,301.00	399,612.00
1C1-10	500 kV GIB Air bushing support structure foundation (GTS901) Pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, TT/KK4-GTS-9-01 01/01, SD-PL-0-01, See Scope of work	18	set	38,023.00	684,414.00



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27 Oct 2023


MEDIUM COST FOR BID NO. IPPP-S-01


1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-11	500 kV GIB support structure foundation (Pile type) (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, RE2-GIB-9-01 01/03 - 03/03, SD-PL-0-01, See Scope of work	Lump Sum	Lump Sum	5,306,393.00	5,306,393.00
1C1-12	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02 01/01	6	set	2,781.00	16,686.00
1C1-13	500 kV Station service voltage transformer structure foundation (SSVT901) pad type	Designed by Contractor, SH/BSP2-FD-VT-9-01 01/01, See Scope of work	3	set	44,241.00	132,723.00
1C1-14	500 kV Station service voltage transformer structure foundation (SSVT901) pile type (pile, dowel bar, pile cut off and pile shoe are included) (*modify to install BP901 on SSVT901)	Designed by Contractor, KEC/PDG-FD-GE-9-01 01/01, SD-PL-0-01, See Scope of work	3	set	33,697.00	101,091.00
1C1-15	500 kV Shunt reactor foundation (SR901) and oil pit (pile type) (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, SH/CBG-SR-9-01 01/01, SD-PL-0-01, See Scope of work	2	set	750,176.00	1,500,352.00


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MEDIUM COST FOR BID NO. IPPP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-16	500 kV Neutral reactor foundation (NR901) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, SH/CBG-NR-9-01 01/01, SD-PL-0-01, See Scope of work	2	set	64,630.00	129,260.00
1C1-17	22&33 kV Distribution transformer foundation (DX401) pad type	FD-DX-4-01 01/01	1	set	12,385.00	12,385.00
1C1-18	Circuit breaker marshalling kiosk foundation (MK) pad type	Designed by Contractor, SH/BSP2-FD-MK-9-01 01/01, See Scope of work	2	set	12,813.00	25,626.00
1C1-19	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03 01/01	5	set	8,816.00	44,080.00
1C1-20	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05 01/01	2	set	7,496.00	14,992.00



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MEDIUM COST FOR BID NO. IPPP-S-01

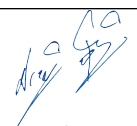
1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-21	Telecommunication tower foundation (WSA) pile type (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, FD-TT-0-08 01/01, SD-PL-0-01, See Scope of work	1	set	242,036.00	242,036.00
1C1-22	Outdoor Load Break Switch foundation. (LBS)	Designed by Contractor, FD-DX-4-01 01/01, See Scope of work	1	set	12,385.00	12,385.00
1C1-23	Lamp Post foundation (Pad Type) (LP3) (LED type)	FD-LP-0-05 01/01	91	set	13,619.00	1,239,329.00
1C1-24	Isolating Transformer Foundation (IST) Pad Type	FD-TX-0-01 01/01	1	set	23,163.00	23,163.00
1C1-25	Lighting Relay Panel foundation (RP002) Pad Type	FD-RP-0-03 01/01	1	set	7,086.00	7,086.00


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MEDIUM COST FOR BID NO. IPPP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-26	Concrete pole strain bus structure (CP12)	CP-SB-4-01 01/01	1	set	34,428.00	34,428.00
1C1-27	69/230 kV Overhead groundwire structure foundation (OG1) Pad Type	FD-OG-0-01 01/01	1	set	131,854.00	131,854.00
Total Price for Schedule 1C1					Baht 16,808,276.00	


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MEDIUM COST FOR BID NO. IPPP-S-01

1C2 : Cable Trench

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht		
					Unit Price	Amount	
1C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 01/02 - 02/02		Lump Sum		6,212,943.37	6,212,943.37
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 01/02 - 02/02		Lump Sum		205,458.00	205,458.00
1C2-3	Cable trench, steel cover included (Type"A")	Designed by Contractor		Lump Sum		1,484,408.40	1,484,408.40
1C2-4	Cable trench, steel cover included (Type"B")	Designed by Contractor		Lump Sum		525,384.00	525,384.00
1C2-5	22kV XLPER Cable trench	Designed by Contractor		Lump Sum		703,248.00	703,248.00



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MEDIUM COST FOR BID NO. IPPP-S-01

1C2 : Cable Trench

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C2-6	Underground cable 22kV and Low voltage cable	Designed by Contractor				
			Lump Sum	Lump Sum	30,411.38	30,411.38
Total Price for Schedule 1C2					Baht	9,161,853.15



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MEDIUM COST FOR BID NO. IPPP-S-01

1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht		
					Unit Price	Amount	
1C3-1	500 kV GIS Building (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, SD-GIS-9-02A 01/09 - 09/09, SD-PL-0-01, See Scope of work		Lump Sum	Lump Sum	137,888,272.62	137,888,272.62
1C3-1.1	Air conditioning system and Ventilation system						
1C3-1.1.1	Ventilation system			Lump Sum	Lump Sum	Included in 1C3-1	Included in 1C3-1
1C3-2	500/230 kV Control Building (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, SD-CD-0-01A 01/33 - 14/33, SD-PL-0-01, See Scope of work		Lump Sum	Lump Sum	43,908,852.24	43,908,852.24
1C3-2.1	Air conditioning system and Ventilation system						


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MEDIUM COST FOR BID NO. IPPP-S-01

1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1.1	Minimum 18,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	25,420.56	25,420.56
1C3-2.1.2	Minimum 36,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	42,523.36	42,523.36
1C3-2.1.3	Minimum 48,000 BTU split-type air conditioner (Invertor), including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		22	set	56,915.88	1,252,149.36
1C3-2.1.4	Minimum 60,000 BTU split-type air conditioner (Invertor), including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		2	set	59,801.00	119,602.00
1C3-2.1.5	Extra work for air conditioning system (additional cooling capacity included)		Lump Sum	Lump Sum	Included in 1C3-2	Included in 1C3-2


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1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1.6	Ventilation system		Lump Sum	Lump Sum	Included in 1C3-2	Included in 1C3-2
1C3-3	Generator Building (pile, dowel bar, pile cut off and pile shoe are included)	Designed by Contractor, SD-PL-0-01, See Scope of work	Lump Sum	Lump Sum	1,048,247.00	1,048,247.00
1C3-4	Solar rooftop system	Designed by Contractor, See Scope of work	Lump Sum	Lump Sum	2,520,000.00	2,520,000.00
Total Price for Schedule 1C3					Baht	186,805,067.14


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MEDIUM COST FOR BID NO. IPPP-S-01
1C4 : Earth Work, Road and Crushed Rock Surfacing
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht		
					Unit Price	Amount	
1C4-1	Crushed rock surfacing 0.10 m thickness			Lump Sum	Lump Sum	7,679,564.30	7,679,564.30
1C4-2	RC.Road type " E " section 4 - 4	SD-RD-0-01 01/02 - 02/02		Lump Sum	Lump Sum	10,624,617.90	10,624,617.90
1C4-3	Transformer loading	SD-RD-0-03 01/01		Lump Sum	Lump Sum	243,067.50	243,067.50
1C4-4	RC. Slab for storage area (20.00x30.00m)	SD-RD-0-03 01/01		Lump Sum	Lump Sum	997,200.00	997,200.00
Total Price for Schedule 1C4						Baht	19,544,449.70


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MEDIUM COST FOR BID NO. IPPP-S-01

1C5 : Water Supply System

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C5-1	Water supply system	Designed by Contractor, See Dwg. No. PSK-C-9, See Scope of work	Lump Sum	Lump Sum	187,827.00	187,827.00
1C5-2	50 cu.m Underground water tank (Pile type) (pile, dowel bar, pile cut off and pile shoe are included)	WD-UT-0-01 01/01, SD-PL-0-01	1	set	464,437.00	464,437.00
1C5-3	15 cu.m Water tank tower Pile type (pile, dowel bar, pile cut off and pile shoe are included)	WD-WT-0-02 01/03 - 03/03, SD-PL-0-01	1	set	533,414.00	533,414.00
1C5-4	Water pump with pump house	WD-WT-0-01 02/03	2	set	61,886.00	123,772.00
1C5-5	Deep well with water treatment system	Designed by Contractor	1	set	569,012.00	569,012.00


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MEDIUM COST FOR BID NO. IPPP-S-01
1C5 : Water Supply System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C5-6	Water treatment system house	Designed by Contractor	1	set	99,018.00	99,018.00
Total Price for Schedule 1C5					Baht	1,977,480.00


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MEDIUM COST FOR BID NO. IPPP-S-01

1C6 : Drainage System

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C6-1	Oil separator (Pile type) (pile, dowel bar, pile cut off and pile shoe are included)	SD-OS-0-02 01/03 - 03/03, SD-PL-0-01	1	set	1,338,322.00	1,338,322.00
1C6-2	Drainage System	Designed by Contractor, See Dwg. No. PSK-C-6, See Scope of work	Lump Sum	Lump Sum	16,235,408.75	16,235,408.75
Total Price for Schedule 1C6					Baht	17,573,730.75


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MEDIUM COST FOR BID NO. IPPP-S-01

1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

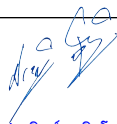
Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-1	64 sq.m Site office	See Scope of work	1	set	850,000.00	850,000.00
1C7-2	Test and commissioning for fire protection system in switchyard		Lump Sum	Lump Sum	120,000.00	120,000.00
1C7-3	Test and commissioning for inert gas system (Test in Electrical room)		Lump Sum	Lump Sum	93,600.00	93,600.00
1C7-4	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)		2	set	144,000.00	288,000.00
1C7-5	Test and commissioning for fire pump system		Lump Sum	Lump Sum	72,000.00	72,000.00



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MEDIUM COST FOR BID NO. IPPP-S-01

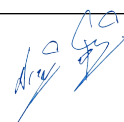
1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-6	Test and commissioning for fire alarm system in GIS building		Lump Sum	Lump Sum	400,000.00	400,000.00
1C7-7	Fire Protection design work		Lump Sum	Lump Sum	610,497.65	610,497.65
1C7-8	Architectural,Engineering design work and 3D Animation presentation file		Lump Sum	Lump Sum	8,042,598.94	8,042,598.94
1C7-9	Dynamic Pile load test		Lump Sum	Lump Sum	930,000.00	930,000.00
1C7-10	Static pile load test		1	set	184,422.15	184,422.15


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MEDIUM COST FOR BID NO. IPPP-S-01
1C7 : Special Construction Works
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-11	Plate bearing test		3	set	20,000.00	60,000.00
Total Price for Schedule 1C7					Baht 11,651,118.74	



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MEDIUM COST FOR BID NO. IPPP-S-01

1C8 : Miscellaneous

**SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-1	Guard house (pile, dowel bar, pile cut off and pile shoe are included)	HS-GH-0-02 01/05 - 05/05, SD-PL-0-01	1	set	500,739.00	500,739.00
1C8-2	Guard house (Prefabricated) (Moveable)	Designed by Contractor, See Scope of work	1	set	68,075.00	68,075.00
1C8-3	Switchyard entrance gate (pile, dowel bar, pile cut off and pile shoe are included)	SD-SG-0-02 01/01, SD-PL-0-01	1	set	310,704.00	310,704.00
1C8-4	Main entrance gate 8.00m width (sliding) (pile, dowel bar, pile cut off and pile shoe are included)	SD-SG-0-03 01/01, SD-PL-0-01	1	set	450,660.00	450,660.00


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1C8 : Miscellaneous

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-5	Wire mesh fence and gate (Pad type)	SD-CF-0-01 01/02 - 02/02	Lump Sum	Lump Sum	2,406,858.40	2,406,858.40
1C8-6	Sign Board Structure & foundation (pile, dowel bar, pile cut off and pile shoe are included)	SD-SB-0-08 01/01, SD-PL-0-01	1	set	243,669.00	243,669.00
1C8-7	Standard symbol and sign letters of substation	TP655A-MS-A 01/01	1	set	659,891.00	659,891.00
1C8-8	Flag Pole (15.00m) (pile, dowel bar, pile cut off and pile shoe are included)	SD-FP-0-02 01/01, SD-PL-0-01	1	set	248,540.00	248,540.00


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MEDIUM COST FOR BID NO. IPPP-S-01

1C8 : Miscellaneous

**SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-9	Duplex house (pile, dowel bar, pile cut off and pile shoe are included)	HS-US-0-05 01/14 - 14/14, HS-US-0-05C 01/06 - 06/06, HS-US-0-05SN 01/03 - 03/03, SD-PL-0-01	2	set	1,871,990.00	3,743,980.00
1C8-10	Garage (5.50x12.00m)	HS-PS-0-02 01/01	1	set	239,448.00	239,448.00
Total Price for Schedule 1C8					Baht	8,872,564.40


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MEDIUM COST FOR BID NO. IPPP-S-01

1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-1	Fire Protection System for 500kV Control Building	Designed by Contractor	Lump Sum	Lump Sum	10,583,232.00	10,583,232.00
1C9-2	Fire Protection System for 500kV GIS Building	Designed by Contractor	Lump Sum	Lump Sum	8,058,996.00	8,058,996.00
1C9-3	Water storage tank min. capacity 250 cu.m (pile, dowel bar, pile cut off and pile shoe are included)	WD-UT-0-05 01/04 - 04/04, SD-PL-0-01	1	set	2,956,336.00	2,956,336.00
1C9-4	Foam house (pile, dowel bar, pile cut off and pile shoe are included)	SD-FH-8-01 01/07 - 07/07, SD-PL-0-01	1	set	1,039,409.00	1,039,409.00



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MEDIUM COST FOR BID NO. IPPP-S-01
1C9 : Fire Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-5	Fire pump house (pile, dowel bar, pile cut off and pile shoe are included)	SD-FPH-8-01 01/01 - 09/09, SD-PL-0-01	1	set	1,563,215.00	1,563,215.00
1C9-6	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04 01/01	1	set	253,733.00	253,733.00
1C9-7	Fire pump system	Designed by Contractor		Lump Sum	5,280,000.00	5,280,000.00
1C9-8	Bladder tank proportioning system and components	Designed by Contractor	1	set	1,199,880.00	1,199,880.00


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1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-9	Fire Protection System for transformer / shunt reactor	Designed by Contractor	2	set	824,293.80	1,648,587.60
1C9-10	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	2,975,386.92	2,975,386.92
1C9-11	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	778,800.00	778,800.00
Total Price for Schedule 1C9					Baht	36,337,575.52


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MEDIUM COST FOR BID NO. IPPP-S-01
1D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D7-1	Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	48,954.00	48,954.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	48,954.00	48,954.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	41,961.00	41,961.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	included	included	XXXXX	XXXXX	XXXXX	XXXXX
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	440,583.00	440,583.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	223,788.00	223,788.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	209,802.00	209,802.00	XXXXX	XXXXX	XXXXX	XXXXX


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MEDIUM COST FOR BID NO. IPPP-S-01
1D7 : Spare Parts for SF6 Gas Insulated Switchgear
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	391,630.00	391,630.00	XXXXX	XXXXX	XXXXX	XXXXX
1D7-9	Loose pressure gauge completed with necessary fitting for circuit breaker compartment accessories for GIS (3 phases set precision pressure gauge spare parts for GIS, can be combined with Gas density meter for CB compartment)	1	set	THB	included	included	XXXXX	XXXXX	XXXXX	XXXXX
1D7-10	Cost of Local Transportation for Item No. 1D7-1 thru 1D7-9	Lump sum	Lump sum	THB	XXXXX	XXXXX	XXXXX	XXXXX	70,283.60	70,283.60
				THB	1,405,672.00		Baht		Baht	
Total Price for Schedule 1D7									70,283.60	


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MEDIUM COST FOR BID NO. IPPP-S-01
1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D11-1	Fuse link or refill unit 20E for 22 kV power fuse (standard speed)	3		THB	15,478.10	46,434.30			XXXXX	XXXXX
1D11-2	6.10 m. (20 ft.) hook stick combination operating hook stick and fuse remover, (14 ft universal with male pin and 6 ft pole extention with female pin) for use with the power fuse	1		THB	32,418.10	32,418.10			XXXXX	XXXXX
1D11-3	Cost of Local Transportation for Item no. 1D11-1 thru 1D11-2		Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,942.62	3,942.62
Total Price for Schedule 1D11				THB	78,852.40		Baht		Baht 3,942.62	

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MEDIUM COST FOR BID NO. IPPP-S-01
1D12 : Spare Parts for AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D12-1	Fuse time lag type 800 A	9				16,028.00	144,252.00	XXXXX	XXXXX	
1D12-2	Cost of Local Transportation for Item no. 1D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	7,212.60	7,212.60	
Total Price for Schedule 1D12							Baht 144,252.00	Baht 7,212.60		


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MEDIUM COST FOR BID NO. IPPP-S-01
1D22 : Spare Parts for Grounding Material
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARA KHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		(excluding VAT) Baht	
					CIF Thai Port		Ex-works Price			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	476,315.20	476,315.20			XXXXXX	XXXXXX
1D22-2	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	1	set	THB	783,072.99	783,072.99			XXXXXX	XXXXXX
1D22-3	Cost of Local Transportation for Item no. 1D22-1 thru 1D11-2									
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	62,969.41	62,969.41
				THB	1,259,388.19		Baht		Baht	
									62,969.41	
				Total Price for Schedule 1D22						

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**MEDIUM COST FOR BID NO. IPPP-S-01
1D24 : Spare Parts for Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1D24-1	BUS DIFFERENTIAL RELAY (Low Impedance- Switching Zone)	Supply as spare part for 8 feeders Drawing No. PSK-E-1	1	EA				921,415.00	921,415.00	XXXXXX	XXXXXX		
1D24-2	LINE CURRENT DIFFERENTIAL RELAY (87L)	Supply as spare part for current rating 1A. Same model as item no.1AB24-5 The communication link of 87L shall be direct link Drawing No. PSK-E-1	1	EA				551,304.00	551,304.00	XXXXXX	XXXXXX		
1D24-3	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply as spare part Drawing No. PSK-E-1	1	EA				439,795.00	439,795.00	XXXXXX	XXXXXX		
1D24-4	DISTANCE RELAY (21P2) FOR 500 kV without 79/25	Supply as spare part Drawing No. PSK-E-1	1	EA				434,868.00	434,868.00	XXXXXX	XXXXXX		
1D24-5	AUTO RECLOSING RELAY (79)	Supply as spare part Drawing No. PSK-E-1	1	EA				278,885.00	278,885.00	XXXXXX	XXXXXX		
1D24-6	BREAKER FAILURE RELAY (50BF+62BF)	Supply as spare part Drawing No. PSK-E-1	1	EA				223,740.00	223,740.00	XXXXXX	XXXXXX		
1D24-7	REACTOR DIFFERENTIAL RELAY (87R)	Supply as spare part Drawing No. PSK-E-1	1	EA				447,124.00	447,124.00	XXXXXX	XXXXXX		

MEDIUM COST FOR BID NO. IPPP-S-01
1D24 : Spare Parts for Control and Protection System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation			
						Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port		Ex-works Price					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1D24-8	NEUTRAL REACTOR DIFFERENTIAL RELAY (87RN)	Supply as spare part Drawing No. PSK-E-1	1	EA			447,124.00	447,124.00	XXXXX	XXXXX			
1D24-9	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Supply as spare part Drawing No. PSK-E-1	1	EA			207,796.00	207,796.00	XXXXX	XXXXX			
1D24-10	OVERFLUXING RELAY (24K,24L)	Supply as spare part Drawing No. PSK-E-1	1	EA			231,061.00	231,061.00	XXXXX	XXXXX			
1D24-11	Cost of Local Transportation for Item No.1D24-1 thru 1D24-10	See scope of work	Lump sum	Lump sum			XXXXX	XXXXX	439,378.00	439,378.00			
Total Price for Schedule 1D24								Baht 4,183,112.00	Baht 439,378.00				


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MEDIUM COST FOR BID NO. IPPP-S-01
1D25 : Spare Parts for Fault Recording System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1D25-1	ANALOG ISOLATOR CARD	Supply as spare part	1	EA			97,196.00	97,196.00	XXXXX	XXXXX			
1D25-2	POWER SUPPLY	Supply as spare part	1	EA			40,211.00	40,211.00	XXXXX	XXXXX			
1D25-3	ACQUISITION UNIT	Supply as spare part	1	EA			28,578.00	28,578.00	XXXXX	XXXXX			
1D25-4	CPU & MEMORY MODULE 1	Supply as spare part	1	EA			95,283.00	95,283.00	XXXXX	XXXXX			


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MEDIUM COST FOR BID NO. IPPP-S-01
1D25 : Spare Parts for Fault Recording System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SARAOKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1D25-5	ANALOG ISOLATOR FOR VOLTAGE	Supply as spare part	1	EA			95,283.00	95,283.00	XXXXX	XXXXX			
1D25-6	ANALOG ISOLATOR FOR CURRENT	Supply as spare part	1	EA			95,283.00	95,283.00	XXXXX	XXXXX			
1D25-7	DIGITAL ISOLATOR MODULE	Supply as spare part	1	EA			92,668.00	92,668.00	XXXXX	XXXXX			
1D25-8	HARD DISK & HARD DISK CONTROLLER	Supply as spare part	1	EA			85,753.00	85,753.00	XXXXX	XXXXX			


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MEDIUM COST FOR BID NO. IPPP-S-01
1D25 : Spare Parts for Fault Recording System
SUPPLY AND CONSTRUCTION OF 500 KV PHANOM SAKHAM SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation			
						Foreign Supply		Local Supply		(excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port		Ex-works Price					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1D25-9	TELE- COMMUNICATION BOARD	Supply as spare part	1	EA			28,578.00	28,578.00	XXXXX	XXXXX			
1D25-10	Cost of Local Transportation for Item No.1D25-1 thru 1D25-9	See scope of work	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	42,390.00	42,390.00		
Total Price for Schedule 1D25							Baht 658,833.00		Baht 42,390.00				


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB9 : Power Circuit Breaker

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
2AB9-1	550 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 70 MVar Y-connected five-limbed core type shunt reactor with 110 kV 0.55 Mvar neutral reactor with earthed neutral)	2		THB	5,576,295.00	11,152,590.00			XXXXXX	XXXXXX		
2AB9-2	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with two Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 2AB9-1	1		THB	1,860,316.00	1,860,316.00			XXXXXX	XXXXXX		
2AB9-3	Circuit breaker marshalling KIOSK as per Dwg. No. TP-E-6.13	2		THB	564,985.00	1,129,970.00			XXXXXX	XXXXXX		
2AB9-4	Steel Supporting Structure for CB995R(IEC) (Item No. 2AB9-1)*	2		THB	164,204.00	328,408.00			XXXXXX	XXXXXX		

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MEDIUM COST FOR BID NO. IPPP-S-01

2AB9 : Power Circuit Breaker

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB9-5	Cost of Local Transportation, Construction and Installation for Item No. 2AB9-1 thru 2AB9-4											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,591,841.24	1,591,841.24		
Total Price for Schedule 2AB9				THB	14,471,284.00		Baht		Baht 1,591,841.24			

*The design of supporting structures of circuit breaker shall be verified by circuit breaker manufacturer.


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MEDIUM COST FOR BID NO. IPPP-S-01
2AB12 : AC&DC Distribution Board and Termination Box
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB12-1	Outdoor Receptacle Box type ORB2 as per Dwg. No. SE-ORB-0-01	1					38,046.00	38,046.00	XXXXX	XXXXX		
2AB12-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	4,185.06	4,185.06		
Total Price for Schedule 2AB12							Baht 38,046.00		Baht 4,185.06			

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MEDIUM COST FOR BID NO. IPPP-S-01

2AB14 : Substation Steel Structure

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB14-1	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	1					11,020.40	11,020.40	XXXXX	XXXXX		
2AB14-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB14-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	3,030.61	3,030.61		
Total Price for Schedule 2AB14							Baht 11,020.40		Baht 3,030.61			


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MEDIUM COST FOR BID NO. IPPP-S-01
2AB18 : Low Voltage Cable and Conductor
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum					103,620.00	103,620.00	XXXXXX	XXXXXX	
2AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum					1,725,240.00	1,725,240.00	XXXXXX	XXXXXX	
2AB18-3	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum					504,000.00	504,000.00	XXXXXX	XXXXXX	
2AB18-4	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum					356,004.00	356,004.00	XXXXXX	XXXXXX	
2AB18-5	Aluminum conductor as per Specification attached	Lump sum	Lump sum					158,400.00	158,400.00	XXXXXX	XXXXXX	
2AB18-6	Cost of Local Transportation, Construction and Installation for Item No. 2AB18-1 thru 2AB18-5	Lump sum	Lump sum					XXXXXX	XXXXXX	XXXXXX	XXXXXX	
Total Price for Schedule 2AB18								Baht		Baht		
								2,847,264.00		652,498.00		


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB21 : Bus Fitting

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	301,047.43	301,047.43			XXXXX	XXXXX		
2AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	68,990.04	68,990.04		
Total Price for Schedule 2AB21				THB	301,047.43		Baht		Baht 68,990.04			


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB22 : Grounding Material

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	19,886.40	19,886.40			XXXXX	XXXXX		
2AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				131,380.58	131,380.58	XXXXX	XXXXX		
2AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	53,984.02	53,984.02			XXXXX	XXXXX		
2AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB22-1 thru 2AB22-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	47,036.69	47,036.69		
				THB	73,870.42		Baht		Baht			
Total Price for Schedule 2AB22							131,380.58		47,036.69			

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MEDIUM COST FOR BID NO. IPPP-S-01

2AB23 : Substation Miscellaneous

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB23-1	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				89,337.60	89,337.60	XXXXXX	XXXXXX		
2AB23-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB23-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	20,473.20	20,473.20		
Total Price for Schedule 2AB23							Baht	89,337.60	Baht	20,473.20		


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB24 : Control and Protection System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-1	BREAKER FAILURE RELAY (50BF+62BF)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA				223,740.00	447,480.00	XXXXX	XXXXX		
2AB24-2	MCB, 6A, 2 POLE FOR DC SUPPLY	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA			4,468.00	8,936.00	XXXXX	XXXXX			
2AB24-3	TEST SWITCH (TS, for relays)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA			14,237.00	28,474.00	XXXXX	XXXXX			
2AB24-4	INDICATING LAMP (R,G,IL,LG)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA			556.00	1,112.00	XXXXX	XXXXX			


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB24 : Control and Protection System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-5	PUSH BUTTON	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA				580.00	1,160.00	XXXXX	XXXXX		
2AB24-6	CUT OFF SWITCH, 10 CONTACTS (DTTCO, 87CO, 86ACO, 50/51SCO)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA				3,462.00	6,924.00	XXXXX	XXXXX		
2AB24-7	LOCKOUT RELAY (86, 20 contacts)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA				71,244.00	142,488.00	XXXXX	XXXXX		
2AB24-8	DC UNDERVOLTAGE RELAY (27XB,27XR)	Supply as loose part installed at Shunt reactor panel, Spec no.1005 Drawing No. PDG-E-1, Scope of work	2	EA				12,374.00	24,748.00	XXXXX	XXXXX		


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2AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-9	MODIFICATION TO THE EXISTING CONTROL AND PROTECTION SYSTEM	See scope of work	1	SET		XXXXX	XXXXX	XXXXX	XXXXX	611,870.00	611,870.00		
2AB24-10	Cost of Local Transportation, Construction and Installation for Item No.2AB24-1 thru 2AB24-8	See scope of work				XXXXX	XXXXX	XXXXX	XXXXX	77,545.00	77,545.00		
Total Price for Schedule 2AB24										Baht 661,322.00	Baht 689,415.00		

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MEDIUM COST FOR BID NO. IPPP-S-01

2AB25 : Fault Recording System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB25-1	MODIFICATION TO THE EXISTING FAULT RECORDING SYSTEM	See scope of work	1	SET		XXXXX	XXXXXX	XXXXXX	XXXXXX	11,800.00	11,800.00		
Total Price for Schedule 2AB25								Baht		Baht 11,800.00			


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MEDIUM COST FOR BID NO. IPPP-S-01

2AB38 : Remote Terminal Unit

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB38-1	MODIFICATION TO THE EXISTING COMPUTERIZED SUBSTATION CONTROL SYSTEM	See scope of work	1	SET		XXXXX	XXXXXX	XXXXXX	XXXXXX	11,800.00	11,800.00		
Total Price for Schedule 2AB38								Baht		Baht 11,800.00			

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MEDIUM COST FOR BID NO. IPPP-S-01

2AB39 : Commissioning

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB39-1	Commissioning	Lump Sum	Lump Sum	THB	XXXXX	XXXXX	XXXXXX	XXXXXX	352,000.00	352,000.00		
				THB			Baht		Baht			
Total Price for Schedule 2AB39									352,000.00			

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MEDIUM COST FOR BID NO. IPPP-S-01

2C1 : Foundation Work

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C1-1	Circuit breaker marshalling kiosk foundation (MK) pad type	Designed by Contractor, SH/BSP2-FD-MK-9-01 01/01, See Scope of work	2	set	12,813.00	25,626.00
2C1-2	500 kV Power circuit breaker foundation (CB901) pad type	Designed by Contractor, SH/BSP2-FD-CB-9-01 01/01, See Scope of work	2	set	64,841.00	129,682.00
2C1-3	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03 01/01	1	set	8,816.00	8,816.00
2C1-4	500 kV Shunt reactor foundation (SR901) and oil pit (pad type)	Designed by Contractor, SH/BSP2-FD-SR-9-01 01/01, See Scope of work	2	set	637,908.00	1,275,816.00
2C1-5	500 kV Neutral reactor foundation (NR901) pad type	Designed by Contractor, SH/BSP2-FD-NR-9-01 01/01, See Scope of work	2	set	41,402.00	82,804.00

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MEDIUM COST FOR BID NO. IPPP-S-01

2C1 : Foundation Work

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C1-6	500 kV Shunt reactor foundation (SR901) and oil pit (pad type) (Existing to be removed)		2	set	72,531.00	145,062.00
2C1-7	500 kV Neutral reactor foundation (NR901) pad type (Existing to be removed)		2	set	3,894.00	7,788.00
Total Price for Schedule 2C1					Baht 1,675,594.00	


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MEDIUM COST FOR BID NO. IPPP-S-01

2C2 : Cable Trench

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**


Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 01/02 - 02/02	Lump Sum	Lump Sum	668,337.50	668,337.50
2C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 01/02 - 02/02	Lump Sum	Lump Sum	100,674.00	100,674.00
2C2-3	Cable trench, steel cover included (Type"A")	Designed by Contractor	Lump Sum	Lump Sum	234,720.00	234,720.00
Total Price for Schedule 2C2					Baht	1,003,731.50


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MEDIUM COST FOR BID NO. IPPP-S-01
2C4 : Earth Work, Road and Crushed Rock Surfacing
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C4-1	Crushed rock surfacing 0.10 m thickness		Lump Sum	Lump Sum	39,932.00	39,932.00
2C4-2	RC.Road type " E " section 4 - 4 (Existing to be removed)	SD-RD-0-01 01/02 - 02/02	Lump Sum	Lump Sum	30,673.50	30,673.50
Total Price for Schedule 2C4					Baht	70,605.50


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MEDIUM COST FOR BID NO. IPPP-S-01

2C6 : Drainage System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C6-1	Drainage System	Designed by Contractor, See Dwg. No. PDG-C-6, See Scope of work	Lump Sum	Lump Sum	1,755,393.00	1,755,393.00
2C6-2	RC cover for sump type "2"	WD-DN-0-01 01/01	3	set	629.00	1,887.00
2C6-3	Steel cover for sump (Existing to be removed)	WD-DN-0-01 01/01	3	set	38.00	114.00
2C6-4	Concrete gutter type " 1 " (Existing to be removed)	SD-RD-0-01 01/02 - 02/02	Lump Sum	Lump Sum	10,927.50	10,927.50
Total Price for Schedule 2C6					Baht	1,768,321.50


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MEDIUM COST FOR BID NO. IPPP-S-01

2C7 : Special Construction Works

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C7-1	Test and commissioning for fire protection system in switchyard		Lump Sum	Lump Sum	120,000.00	120,000.00
2C7-2	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)		2	set	144,000.00	288,000.00
2C7-3	Fire Protection design work		Lump Sum	Lump Sum	94,837.78	94,837.78
2C7-4	Architectural and Civil engineering design work		Lump Sum	Lump Sum	113,239.49	113,239.49
2C7-5	Plate bearing test		2	set	20,000.00	40,000.00
Total Price for Schedule 2C7					Baht	656,077.27

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MEDIUM COST FOR BID NO. IPPP-S-01

2C9 : Fire Protection System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV PLUAK DAENG SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C9-1	Foam house	SD-FH-8-01 01/07 - 07/07	1	set	990,176.00	990,176.00
2C9-2	Bladder tank proportioning system and components	Designed by Contractor	1	set	1,199,880.00	1,199,880.00
2C9-3	Fire Protection System for transformer / shunt reactor	Designed by Contractor	2	set	751,825.80	1,503,651.60
2C9-4	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	1,213,357.20	1,213,357.20
2C9-5	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	825,000.00	825,000.00
Total Price for Schedule 2C9					Baht	5,732,064.80


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MEDIUM COST FOR BID NO. IPPP-S-01

3AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS


Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB23-1	Identification and danger notice plate as per drawing attached						13,400.64	13,400.64	XXXXX	XXXXX		
3AB23-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB23-1				XXXXX	XXXXX	XXXXX	XXXXX	3,070.98	3,070.98		
Total Price for Schedule 3AB23							Baht 13,400.64		Baht 3,070.98			

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MEDIUM COST FOR BID NO. IPPP-S-01
3AB24 : Control and Protection System
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB24-1	MODIFICATION TO THE EXISTING CONTROL AND PROTECTION SYSTEM	See scope of work	1	SET		XXXXX	XXXXX	XXXXX	XXXXX	96,000.00	96,000.00		
Total Price for Schedule 3AB24								Baht		Baht 96,000.00			


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MEDIUM COST FOR BID NO. IPPP-S-01

3AB25 : Fault Recording System

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB25-1	MODIFICATION TO THE EXISTING FAULT RECORDING SYSTEM	See scope of work	1	SET		XXXXXX	XXXXXX	XXXXXX	XXXXXX	11,800.00	11,800.00		
Total Price for Schedule 3AB25								Baht		Baht 11,800.00			



นางสาวเบญญาลักษณ์ ศรีลัมพ์
 หจตส-ห.
 26 ม.ค. 67



นายประวิทย์ เลิศโกวิทย์
 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

3AB38 : Remote Terminal Unit

**SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
3AB38-1	MODIFICATION TO THE EXISTING COMPUTERIZED SUBSTATION CONTROL SYSTEM	See scope of work	1	SET		XXXXX	XXXXXX	XXXXXX	XXXXXX	11,800.00	11,800.00		
Total Price for Schedule 3AB38								Baht		Baht 11,800.00			



นางสาวเบญญาลักษณ์ ศรีลัมพ์
 หจตส-ท.
 26 ม.ค. 67



นายประวิทย์ เลิศโกวิทย์
 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
 27 Oct 2023

MEDIUM COST FOR BID NO. IPPP-S-01

3AB39 : Commissioning

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV WANG NOI SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB39-1	Commissioning	Lump Sum	Lump Sum	THB	XXXXX	XXXXX	XXXXX	XXXXX	135,300.00	135,300.00		
				THB			Baht		Baht			
Total Price for Schedule 3AB39									135,300.00			



นางสาวเบญญาลักษณ์ ครลัมพ์

ทดตส-ท.

26 ม.ค. 67



นายประวิทย์ เลิศโกวิท
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
27 Oct 2023

Important Information
for
Invitation to Bid No. IPPP-S-01

The purpose of this section is to inform the Bidders to **carefully study** the details of the revised terms and conditions in the bidding documents. The following provisions have been **recently revised** as stated hereunder:

Additional Regulation

Information to be submitted with Bid as required in Item 3.2 has been revised.

The following paragraph in Remarks Item 4. of page 11 of Additional Regulation has been deleted :-

“In case that any Major Shareholder(s) of the Bidder is (are) juristic person(s), and such juristic person(s) has (have) Major Shareholder(s) who is (are) juristic person(s), the Bidder shall submit the list of the Major Shareholder(s)/ the Names of Manager/ Managing Partner/ Managing Director/ Executive/ Person Who Is Authorized to Manage the Business/ Partner/ Partner with Unlimited Liability/ of such juristic person(s) as per page 10-11 of this Additional Regulation. The requirement of submission of list of the Major Shareholder(s)/ the Names of Manager/ Managing Partner/ Managing Director/ Executive/ Person Who Is Authorized to Manage the Business/ Partner/ Partner with Unlimited Liability/ of such juristic person(s) shall apply to 2 tiers of Major Shareholder(s) who is(are) juristic person(s).”

Article A-3. Eligibility of Bidders: General Requirements and Article B-8. Information to be Submitted with Bid

Bidders shall provide written anti-corruption policies and guidelines as specified in Data Sheet.

Article A-4. Eligibility of Bidders: Technical Requirements

The Bidder shall be named in EGAT Accepted Bidders List for Supply and Construction of Substations attached at the end of Section A. Invitation to Bid.

Some of the Equipment to be proposed by the Bidder shall be only those specified in EGAT Accepted List for such Equipment as attached at the end of Section A. Invitation to Bid. The Bidder shall carefully study Article A-4. Eligibility of Bidders: Technical Requirements and make sure to propose Equipment correctly.

Article B-3. Bid Security

Terms and conditions regarding the forms of bid security have been revised.

Article E-15. Performance Security and Specimen of Performance Security

Terms and conditions regarding the forms and the amount of performance security have been revised.

Article E-16. Inspection and Tests

Terms and conditions regarding inspection and tests have been revised.

Article E-35. Advance Payment Security

Terms and conditions regarding the forms of advance payment security have been revised.

Article F-8. Drawings and Documents to be Furnished by the Contractor

Terms and conditions regarding EGAT's document management system in item a. have been added. The number of copies of the drawings and documents in Print and CD-ROM has been revised and Item c. Reproducible Drawings has been deleted.

Details in Drawings and Documents Required for Each Particular Equipment at the end of section F have been revised.

Article F-15. Liquidated Damages for Late Completion and Late Delivery

The total amount of liquidated damages shall not exceed ten (10) per cent of the total Contract Price, thereafter EGAT shall have the right, at its sole discretion, to terminate the Contract.

Article F-18. Maintenance Guarantee and Article F-19. Maintenance Security

In case all obligations on the part of the Contractor for the work under separated guarantee period under the Contract have been fulfilled, the Contractor is entitled to request EGAT to return the maintenance security guaranteed for such work regardless of the non-issuance of the Final Acceptance Certificate.

Article F-19. Maintenance Security and Specimen of Maintenance Guarantee

Terms and conditions regarding the forms and the amount of maintenance security have been revised.

Article G-5. Safety of Personnel and Third Parties and Prevention of Accidents

Safety terms and conditions have been revised. The Contractor shall observe and comply with the revised terms and conditions including Table 1. Safety Criteria and Conditions, Table 2. Contractor's Safety Information, and Table 3. Contractor Safety Evaluation Checklist which have been added at the end of Section G.

DATA SHEET

for

Invitation to Bid No. IPPP-S-01

(Two-envelope)

This Section consists of provisions that are specific to each procurement and supplement the information or requirements included in Bidding Documents.

Article A-3. Eligibility of Bidders: General Requirements

The following requirement shall be added to item I.:

“j. Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies according to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017).”

Article B-3. Bid Security

The amount of bid security shall be USD 1,927,770.- or THB 71,573,500.-.

Article B-4. Validity of Bids

The validity of the bid shall be for three hundred (300) Days from the date specified for opening of technical proposals.

Article B-8. Information to be Submitted with Bid

The following document shall be added to Article B-8. Information to be Submitted with Bid:

s. Bidder’s anti-corruption policies and guidelines in relation to procurement and supplies together with the completely filled out Anti-Corruption Compliance Checklist as provided.

Article F-15. Liquidated Damages for Late Completion and Late Delivery, item a. For Complete Construction of Substation,

If the Contractor fails to meet any of the completion dates for Schedule 1 : 500 kV Phanom Sarakham Substation (GIS) or Schedule 2 : 500 kV Pluak Daeng Substation or Schedule 3 : 500 kV Wang Noi Substation, the liquidated damages shall be at the rate of one-tenth of one (0.10) per cent of the total Contract Price for Schedule 1 : 500 kV Phanom Sarakham Substation (GIS) and Schedule 2 : 500 kV Pluak Daeng Substation and Schedule 3 : 500 kV Wang Noi Substation for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred.

Maintenance Guarantee Period

- For all Work except 500 kV System

The Contractor shall guarantee the proper functioning of the Work for a period of one (1) Year except the following Equipment the guarantee period of which shall be as follows :

<u>Equipment</u>	<u>Period of Guarantee (Year)</u>
- Fault Recording System	2
- Control and Protection System	2

- For 500 kV System

The Contractor shall guarantee the proper functioning of the Work for a period of five (5) Years.

Defective Equipment to be replaced with the whole new set

Not Applicable

Anti-Corruption Compliance Checklist
(Consortium)

Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies pursuant to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, in accordance with Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project :

State Agency: Electricity Generating Authority of Thailand

Member No. ... of the consortium:

.....

Item	Yes	No	Reference (Please specify Article)
1. Bidders have any written anti-corruption policies and guidelines which have been communicated to all levels of employees.			
2. Bidders impose penalty or regulations against corruption.			
3. Bidders have accessible channels or systems to report any suspicions or queries related to corruption.			
4. Bidders have internal personnel or unit explicitly responsible for the prevention of corruption.			

We hereby confirm that all above statements are true and correct.

Signed

(Name of Bidder)
(Authorized person)
Stamp company seal (if any)

Anti-Corruption Compliance Checklist
(Individual Company / Joint Venture)

Bidders shall provide written anti-corruption policies and guidelines with respect to procurement and supplies pursuant to the Notification of the Anti-Corruption Co-Operation Committee Concerning Minimum Standards of the Anti-Corruption Policies and Guidelines in Relation to Procurement and Supplies Required to be Implemented by the Business Operator, in accordance with Section 19 of the Government Procurement and Supplies Management Act B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project :

State Agency: Electricity Generating Authority of Thailand

Bidder Name :

Item	Yes	No	Reference (Please specify Article)
1. Bidders have any written anti-corruption policies and guidelines which have been communicated to all levels of employees.			
2. Bidders impose penalty or regulations against corruption.			
3. Bidders have accessible channels or systems to report any suspicions or queries related to corruption.			
4. Bidders have internal personnel or unit explicitly responsible for the prevention of corruption.			

We hereby confirm that all above statements are true and correct.

Signed

(Name of Bidder)

(Authorized person)

Stamp company seal (if any)

ELECTRICITY GENERATING AUTHORITY OF THAILAND

Nonthaburi
Thailand

INVITATION TO BID NO. IPPP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV PHANOM SARAKHAM SUBSTATION (GIS) AND IMPROVEMENT OF 500 kV PLUAK DAENG AND 500 kV WANG NOI SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER PURCHASE FROM IPP POWER PLANTS

(TWO-ENVELOPE)

A-1. Invitation

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 500 kV Phanom Sarakham Substation (GIS) and Improvement of 500 kV Pluak Daeng and 500 kV Wang Noi Substations under Transmission System Development for Power Purchase from IPP Power Plants as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

A-2. Work Description

The supply and construction of 500 kV Phanom Sarakham Substation (GIS) and Improvement of 500 kV Pluak Daeng and 500 kV Wang Noi Substations will be on a supply and construction basis, the Contractor shall be responsible for complete supply, installation, construction and also engineering design work to the standard specified and best modern practice. The substations to be constructed and the scope of work under this Invitation are described in Section H. Scope of Work.

A-3. Eligibility of Bidders: General Requirements

I. All Bidders shall meet the following requirements; failure to so comply shall constitute sufficient ground for rejection.

- a. The Bidder shall be a partnership, firm or company, either alone or in joint venture or in consortium.

- b. The Bidder shall be well-established and maintain a permanent place of business.
- c. The Bidder shall not be, or supply the Equipment, from the country under the state of Civil War.
- d. The Bidder shall be a juristic person who manufactures or provides such material or services, as the case may be, and not be named in the List of Work Abandoners published by the Permanent Secretary, Ministry of Finance and/or in the Debarment List and/or in the List of Work Abandoners declared by EGAT.
- e. The Bidder shall not be a Jointly Interested Bidder with other Bidders as from the date of EGAT's issuance of the Invitation to Bid, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" as defined in Additional Regulation for this Invitation.
- f. The Bidder shall not either be EGAT's consultant or involving in EGAT's consultancy company under this Invitation, or have EGAT's personnel involved in his business as shareholder having voting right that can control his business, director, manager, officer, employee, agent or consultant except for the ones who are officially ordered by EGAT to act or participate therein.
- g. The Bidder shall not be the person who is privileged or protected not to be taken any legal proceeding under Thai Court; provided that such Bidder's government declares that such special privilege is waived.
- h. In case of a joint venture or consortium, the Bidder shall carry out all the work under such formation from the time of bidding until the fulfillment of the Contract.
- i. ***The Bidder must have purchased the bidding documents from EGAT. For a joint venture or a consortium, only one (1) member of the joint venture or consortium is required to purchase the bidding documents.***

In case the Bidder's name is not exactly the same as the purchaser's name, the purchaser shall notify EGAT of the name of the Bidder in writing prior to the bid opening time.

II. All Bidders should preferably meet the following requirements; failure to so comply may constitute sufficient ground for rejection.

- a. The Bidder shall have adequate fund to meet financial obligations incidental to this Contract.

- b. The Bidder shall supply documentary evidence established in accordance with Article B-8. Information to be Submitted with Bid to demonstrate adequately that he is eligible to bid and is qualified to perform the Contract if his bid is accepted. Bidder should also demonstrate his capacity to perform the Work either with or without the use of subcontractor.

A-4. Eligibility of Bidders: Technical Requirements

I. All Bidders shall meet the following requirements; failure to so comply shall constitute sufficient ground for rejection.

- a. Being well-established and maintaining a permanent place of business.

If the Bidder is a new company formed by acquisition of or merger with other companies or business units before submitting the Bid, the experience records of any of such previous companies or business units that meet the requirements set forth herein are acceptable as the experience records of the Bidder.

If Bidder is a new company formed by acquisition of or merger with other companies or business units, the pending claim of any of such previous companies or business units shall be considered pending claim of the Bidder.

Reference records of either the parent or affiliated companies shall not be considered as the record of such Bidder.

- b. The Bidder shall be named in EGAT Accepted Bidders List for Supply and Construction of Substations attached at the end of Section A. Invitation to Bid.
- c. The Bidder shall propose Equipment manufactured by the qualified manufacturers who shall fulfill the following requirements:

1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
2. Being well-established and maintaining a permanent place of business.
3. The manufacturer shall have the experience records that meet the requirements set forth herein.

Reference records of either parent or affiliated companies shall not be considered as the records of such manufacturer.

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be

manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item I.c.6. Otherwise, it shall not be acceptable and shall be sufficient grounds for rejection.

For the avoidance of doubt, it is not allowed to combine the experience records of the previous companies or business units in order to meet the experience requirements.

5. For Equipment, having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid, shall have the following qualifications:

- 5.1 These Equipment shall be named in the EGAT Accepted List.

- 5.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification (if required).

6. For Equipment not having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid:

- 6.1 For 500 kV Ratings of Gas-Insulated Switchgear (GIS) or Gas-Insulated Bus (GIB). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

- 6.1.1 Having one of the following qualifications:

- 6.1.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.1.1.2 Having supply record of Equipment of the type proposed (type of enclosure, interrupter of circuit breaker, rated filling gas pressure) at the maximum system voltage of 420 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least five (5) consecutive years in overseas country (not his own country) and at least three (3) substations of which total GIS bays shall not be less than twelve (12).

In case that supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed/modified type of such Equipment with successful operation/use of at least three (3) substations of which total GIS bays shall not be less than twelve (12) and for minimum one (1) year in overseas country (not

his own country). The detailed information of the development/modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider/accept the proposed developed/modified type.

Supply records of the higher rating Equipment shall not be considered if the Bidder does not propose such higher rating Equipment in his bid.

6.1.2 Having a past design test record of the equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

6.2 For 500 kV Control and Protection Panel, having the following qualifications:

6.2.1 Being local manufacturer.

6.2.2 Having one of the following qualifications:

6.2.2.1 Having a letter of acceptance for manufacturing of Control and Protection Boards and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein.

OR

6.2.2.2 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

II. All Bidders should preferably meet the following technical requirements; failure to so comply may constitute sufficient ground for rejection.

- a. The Bidder shall have sufficient capacity to carry out the work.
- b. The Bidder shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. In case the Bidder is a joint venture/consortium, either member of the joint venture/consortium shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT.
- c. The Bidder himself or his subcontractors, at the time of submitting this proposal, shall not carry excessive work nor be in a default position with respect to work with EGAT. Unsatisfactory past performance on Contract awarded by EGAT may be a sufficient reason of being disqualified.

d. The Bidder shall propose Equipment from manufacturers who fulfill the requirements below. If there is any deficiency, EGAT reserves the right to require the Bidder to propose new manufacturer or new type/model of Equipment without any additional cost to EGAT.

1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
2. Being well-established and maintaining a permanent place of business
3. The manufacturer shall have the experience records that meet the requirements set forth herein.

Reference records of either parent or affiliated companies shall not be considered as the records of such manufacturer.

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item II.d.6 below.

For the avoidance of doubt, it is not allowed to combine the experience records of the previous companies or business units in order to meet the experience requirements.

5. For Equipment, having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid, shall have the following qualifications:

5.1 These Equipment shall be named in the EGAT Accepted List.

5.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification (if required).

6. For Equipment not having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid.

6.1 For 500 kV Ratings of following Equipment: Power Circuit Breaker, Instrument Transformer, Surge Arrester and Disconnecting Switch. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

6.1.1 Having one of the following qualifications:

6.1.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.1.1.2 Having a supply record of Equipment of the type proposed at the maximum system voltage of 420 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least five (5) three phase sets and for minimum five (5) consecutive years in an overseas country (not his own country).

In case that the supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least five (5) three phase sets and of minimum one (1) year in overseas country (not his own country). The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be considered if the Bidder does not propose such higher rating Equipment in his bid.

- 6.1.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

- 6.2 For 33, 22 and 11 kV ratings of following equipment: Metal-Clad SF₆ Gas Insulated Switchgear, Power Circuit Breaker, Instrument Transformer, Disconnecting Switch and Surge Arrester:

Having one of the following qualifications:

- 6.2.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.

OR

- 6.2.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least three (3) three phase sets. The ratings and features of Equipment shall be the same or similar rating as EGAT specifies.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least one (1) year in overseas country (not his own country) and at least three (3) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type. EGAT, however, reserves the right and will make its own judgment whether or not to consider/accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be accepted if the Bidder does not propose such higher rating Equipment in his bid.

6.3 For Distribution Transformer, Power Fuse, AC&DC Distribution Board and Lighting Relay Panel (LRP), Load Center Unit Substation (LCUS), Junction Box, Battery Charger, Substation Steel Structure, 33 kV and below Cable Terminations, XLPE Power Cable, Power Cable, Control Cable and Switchboard Wire, Lighting Cable, Copper Ground Wire, Overhead Ground Wire, Aluminum Conductor, Optical Fiber Cable, Switchyard Lighting Fixtures, Aluminum Tube, Compression Connector and Miscellaneous Hardware, Bus Fittings, Ground Rod, Thermite Welding Material, Grounding Hardware, Conduit and Conduit Fittings:

6.3.1 Being local manufacturer for the following Equipment:

Distribution Transformer, AC&DC Distribution Board and Lighting Relay Panel (LRP), Load Center Unit Substation (LCUS), Junction Box, Battery Charger, Substation Steel Structure, 115 kV and below XLPE Power Cable, Power Cable, Control Cable and Switchboard Wire, Lighting Cable, Copper Ground Wire, Overhead Ground Wire, Aluminum Conductor, Single mode optical fiber cable, Switchyard Lighting Fixtures, Aluminum Tube, 230 kV and below Compression Connector and Miscellaneous Hardware, Thermite Welding Material and Conduit.

6.3.2 Having been granted a license for producing standard product by Thai Industrial Standard Institute (TISI), Ministry of Industry:

60 kV through 115 kV XLPE Power Cable, Lighting cable and Aluminum conductor.

6.3.3 Having one of the following qualifications:

6.3.3.1 Having supply record of Equipment of the type and similar ratings proposed with successful operation/use for at least one (1) year.

OR

6.3.3.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.4 For Insulator:

Having one of the following qualifications:

6.4.1 Having supply record with successful operation/use for at least three (3) consecutive years in overseas country (not his own country) and for following equipment:

6.4.1.1 Suspension Insulator, at least 10,000 units having the similar ANSI class as proposed.

6.4.1.2 Station Post Insulator, having the similar ANSI technical reference number as proposed.

OR

6.4.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.5 For Stationary Battery:

Having one of the following qualifications:

6.5.1 Having supply record of Equipment of the type and similar ratings proposed with successful operation/use in substations/switchyards of at least three (3) consecutive years and at least three (3) sets.

In case that the supply record of Equipment of the type and similar ratings proposed fulfilled the requirements, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use of at least one (1) year. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgement whether or not to consider or accept the proposed developed or modified type.

OR

6.5.2 Having a letter of acceptance for manufacturing and/or fabrication of the specific Equipment issued by EGAT within the scope specified therein (For the local manufacturer).

6.6 For above 33kV through 500 kV Outdoor Type Cable Termination and Cable Termination for GIS:

Having one of the following qualifications:

6.6.1 Proposing the Equipment of the type and ratings which have ever been accepted by EGAT.

OR

6.6.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use for at least three (3) consecutive years in an overseas country (not his own country) and at least five (5) three phase sets. The ratings and features of Equipment shall be the same or similar rating as EGAT specifies.

In case that the supply record of Equipment of the type and ratings proposed fulfilled the requirement, the manufacturer may propose a newly developed or modified type of such Equipment with successful operation/use for at least one (1) year in overseas country (not his own country) and at least five (5) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

Supply records of the higher rating Equipment shall not be accepted if the Bidder does not propose such higher rating Equipment in his bid.

6.7 Proposing the protective relays from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications. Type/Model of the protective relays proposed shall be as specified in EGAT ACCEPTED MULTIFUNCTION RELAY LIST attached at the end of Section A. Invitation to Bid.

6.8 For Fault Recording System:

6.8.1 Having one of the following qualifications:

6.8.1.1 The cabinet and all Equipment are completely wired by the FRS manufacturer before shipping to Thailand.

OR

6.8.1.2 The cabinet and the Equipment are wired in Thailand by the local cabinet manufacturer who has one of the following qualifications:

6.8.1.2.1 Having a letter of acceptance for manufacturing of Control and Protection Boards and/or fabrication of the specific equipment issued by EGAT within the scope specified therein.

OR

6.8.1.2.2 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

The design and engineering shall be performed by the FRS manufacturer. The assembly, factory test and commissioning shall be in accordance with the FRS manufacturer's standard and shall be performed under the FRS manufacturer's supervisor.

6.8.2 Proposing the Fault Recording System (FRS) from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR FAULT RECORDING SYSTEM attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications. Type/model of FRS proposed shall be as specified in EGAT ACCEPTED FAULT RECORDING SYSTEM LIST attached at the end of Section A. Invitation to Bid.

6.9 Being local manufacturer for steel supporting structure of Instrument Transformer, Surge Arrester and Disconnecting Switch.

6.10 For Closed-circuit television (CCTV) system and equipment:

6.10.1 Proposed camera and Network Video Recorder (NVR) manufacturer shall have a representative or a branch office of manufacturer in Thailand for at least ten (10) years.

6.10.2 Proposed brand of IP cameras shall have a supply record of IP cameras for at least five hundred (500) IP cameras per contract with successful operation/use for at least three (3) years in Thailand.

6.10.3 The bidder or subcontractor shall have one of the following qualifications:

6.10.3.1 Having experiences in installation and cabling of outdoor-type IP cameras for at least fifty (50) cameras per contract with successful operation/use for at least three (3) years in Thailand.

OR

6.10.3.2 Having experiences in optical fiber cabling in substation switchyards for at least five (5) substations per contract with successful operation/use for at least three (3) years in Thailand.

6.10.4 Being local manufacturer for the following Equipment: CCTV Rack cabinet, Monitoring desk, CCTV pole, 12-core ADSS optical fiber cable.

e. Proposing the manufacturer who has no just or proper claims pending against Equipment of the same type/model to be proposed under this bid.

In case the manufacturer is a new company formed by acquisition or merger with other companies or business units, the pending claim of any of such previous companies or business units shall be considered pending claim of the manufacturer.

f. Proposing reputable subcontractors, for the portion of the work to be subcontracted, having adequate technical knowledge, ability and capacity to perform such work and having at least three years experience in the performance of similar work and of equal magnitude to the work to be subcontracted. If any proposed subcontractor(s) is (are) not qualified in the opinion of EGAT, the Bidder is required to select other subcontractor(s) at his own cost to the satisfaction of EGAT.

Definitions:

Year(s) of operation/use: The period of operation Completion date or Commissioning date or Taking over date or Operation date or Put in service date stated in End User Certificate or the sufficient documentary evidence before bid opening.

A-5. Joint Venture or Consortium

In the event that the successful Bidder is a joint venture or a consortium formed of two or more companies, EGAT requires that the parties to the joint venture or the consortium accept joint and several liability for all obligations under the Contract.

A-6. Preparation and Delivery of Bids

Bids shall be prepared in accordance with the Instructions to Bidders contained in the Bidding Documents in one (1) original and three (3) hard copies, in English, on the bid forms included for this purpose and shall be accompanied with a bid security as required under Article B-3. Bid Security.

The original and each copy of the proposal shall be placed in two (2) separate sealed envelopes:

Envelope I which shall contain a sealed technical proposal, and
Envelope II which shall contain a sealed price proposal.

Envelope I

Technical proposal will be placed in separate sealed envelope marked in capital letters in the lower left-hand corner as follows:

INVITATION TO BID NO. IPPP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV PHANOM SARAOKHAM
SUBSTATION (GIS) AND IMPROVEMENT OF 500 kV PLUAK DAENG
AND 500 kV WANG NOI SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER
PURCHASE FROM IPP POWER PLANTS

TECHNICAL PROPOSAL

The Envelope for the technical proposal shall contain the following :

- a. the completed Proposal Data Forms of the proposed proposal(s)
- b. reference documents pertaining to Bidder's qualification and experience under Article A-3. Eligibility of Bidders: General Requirements, A-4. Eligibility of Bidders: Technical Requirements, and Article B-8. Information to be submitted with Bid
- c. delivery date guaranteed by Bidders
- d. any minor deviations on Technical Specifications

- e. any other technical information and drawings the Bidder deems to be adequate to explain his bid
- f. Confirmation Form of not being a Jointly Interested Bidder with other Bidders and not being a person who undertakes any actions as an Obstruction of Fair Price Competition, and Registration/Non-registration with the Revenue Department as a VAT registrant

If the Bidder has registered as a VAT registrant, he shall submit EGAT an evidence of VAT registration. On the contrary, if the Bidder is not registered as a VAT registrant, he shall inform EGAT whether he will register as a VAT registrant or not.

In case the Bidder is a consortium, each member of the consortium shall fill in the Confirmation Form provided for consortium Bidders.

- g. Filled-in Documentary List and documents required according to Additional Regulation

Strictly no prices or reference to price shall be made in the documentation contained in this Envelope. Violation of this requirement will be reason for rejection of the bid.

Envelope II

Price proposal will be placed in separate sealed envelope marked in capital letters in the lower left-hand corner as follows:

INVITATION TO BID NO. NO. IPPP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV PHANOM SARAKHAM
SUBSTATION (GIS) AND IMPROVEMENT OF 500 kV PLUAK DAENG
AND 500 kV WANG NOI SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT FOR POWER
PURCHASE FROM IPP POWER PLANTS

PRICE PROPOSAL

The Envelope for the price proposal shall contain the following :

- a. price schedules according to Section C
- b. price schedules data CD in Microsoft Excel format
- c. Discount Form

The bid security in accordance with Article B-3. Bid Security shall be submitted in a separate envelope.

The original and three (3) hard copies of the technical proposal and the price proposal shall be addressed and delivered to :

International Procurement Department - Transmission Segment
Procurement and Inventory Management Division
Electricity Generating Authority of Thailand
Bangkrui, Nonthaburi 11130
Thailand

on or before 10:00 a.m., Bangkok Standard Time, see Tentative Schedule

If the envelope(s) is not sealed, marked and addressed as required above, EGAT will assume no responsibility for the bid misplacement or premature opening.

Technical proposals will be opened publicly at ***Bidding Room, 1st floor, Tor 082 Building*** and at the time specified above.

Bids received after the time stipulated herein shall be rejected and returned unopened.

The technical proposals will be reviewed to determine their responsiveness to the Specifications and requirements.

The price proposals of the responsive technical proposals will be opened publicly at the place and time which will be specified at a later date, which will not be later than 150 Days after the technical proposal opening.

A-7. Availability of Bidding Documents

The Bidding Documents in CD-ROM are available for examination and can be obtained from EGAT at the hereunder address upon payment to EGAT, non-refundable, in the amount of USD 500.- or Baht 15,000.-; these prices include the value added tax.

International Procurement Department - Transmission Segment
Procurement and Inventory Management Division
Electricity Generating Authority of Thailand
Bangkrui, Nonthaburi 11130
Thailand

Note : At the time of bidding, EGAT's Specifications and all Drawings need not be submitted, although they are considered as part of the Bidding Documents.

EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
1	Hitachi Energy (Thailand) Limited / Thailand	YES	YES	YES
2	Grid Solutions SAS / France	YES	YES	YES
3	Hitachi Ltd. / Japan	YES	YES	YES
4	Hyosung Heavy Industries Corporation / Korea	YES	YES	YES
5	KEC International Limited / India	YES	YES	YES
6	Mitsubishi Corporation / Japan	YES	YES	YES
7	Mitsubishi Electric Corporation / Japan	YES	YES	YES
8	Precise System and Project Co., Ltd. / Thailand	YES	YES	YES
9	SEPCOIII Electric Power Construction Co., Ltd. / P.R.China	YES	YES	YES
10	Siemens Energy Limited / Thailand	YES	YES	YES
11	Sri U-Thong Limited / Thailand	YES	YES	YES
12	TEDA Company Limited / Thailand	YES	YES	YES
13	Joint Venture of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Co., Ltd. / P.R.China)	YES	YES	YES
14	Consortium of Grid Solutions (Thailand) Ltd. and Grid Solutions SAS (Grid Solutions (Thailand) Ltd. / Thailand and Grid Solutions SAS / France)	YES	YES	YES
15	Consortium of Larsen & Toubro Limited and Sri U-Thong Limited (Larsen & Toubro Limited / India and Sri U-Thong Limited / Thailand)	YES	YES	YES
16	Consortium of Loxley Public Co., Ltd. and Sri U-Thong Limited (Loxley Public Co., Ltd. / Thailand and Sri U-Thong Limited / Thailand)	YES	YES	YES
17	Consortium of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Co., Ltd. / P.R. China)	YES	YES	YES
18	SBV Consortium (Sumitomo Corporation / Japan, Black & Veatch (Thailand) Limited / Thailand and Italian-Thai Development / Thailand)	YES	YES	YES
19	The Consortium of Mitsubishi Corporation and DEMCO Public Company Limited (Mitsubishi Corporation / Japan and DEMCO Public Company Limited / Thailand)	YES	YES	YES
20	The Consortium of Precise System and Project Co., Ltd. and Hitachi Ltd. (Precise System and Project Co., Ltd. / Thailand and Hitachi Ltd. / Japan)	YES	YES	YES
21	The Consortium of Mitsubishi Corporation and PWH (Thailand) Company Limited (Mitsubishi Corporation / Japan and PWH (Thailand) Company Limited / Thailand)	YES	YES	YES
22	Consortium of Larsen & Toubro Limited and Mitsubishi Corporation (Larsen & Toubro Limited / India and Mitsubishi Corporation / Japan)	YES	YES	YES
23	Sri U-Thong & LPS CONSORTIUM (Sri U-Thong Limited / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)	YES	YES	YES
24	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Sri U-Thong Limited. (DEMCO Public Company Limited / Thailand, KINDEN Corporation / Japan and Sri U-Thong Limited / Thailand)	YES	YES	YES
25	J.R.W. Utility - Siemens Energy Consortium (J.R.W. Utility Public Company Limited / Thailand and Siemens Energy Limited / Thailand)	YES	YES	YES
26	SIEMENS ENERGY & LPS CONSORTIUM (Siemens Energy Limited / Thailand and LOXLEY Power Systems Company Limited / Thailand)	YES	YES	YES
27	CONSORTIUM OF HYOSUNG HEAVY INDUSTRIES CORPORATION & FUTURE ELECTRICAL CONTROL COMPANY LIMITED (HYOSUNG HEAVY INDUSTRIES CORPORATION / Korea and FUTURE ELECTRICAL CONTROL COMPANY LIMITED / Thailand)	YES	YES	YES

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 ก่อนนำไปใช้งาน
 ต้องตรวจสอบ Revision คำสุด
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

EGAT Accepted Bidders List for Supply and Construction of Substations

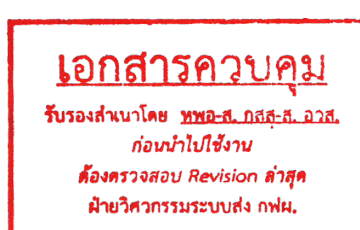
No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
28	Joint Venture of SEPCOIII-BYP (SEPCOIII Electric Power Construction Co., Ltd. / P.R. China and Benyapha Power Line Co., Ltd. / Thailand)	YES	YES	YES
29	Consortium of KEC International Limited and Mega Consultants Company Limited (KEC International Limited / India and Mega Consultants Company Limited / Thailand)	YES	YES	YES
30	Consortium of KEC International Limited and GreenTech Solution Co., Ltd. (KEC International Limited / India and GreenTech Solution Co., Ltd. / Thailand)	YES	YES	YES
31	Consortium of KEC International Limited and CS Power and Project Company Limited (KEC International Limited / Indai and CS Power and Project Company Limited / Thailand)	YES	YES	YES
32	Hyundai Engineering & Construction Co., Ltd. / Korea		YES	YES
33	Larsen & Toubro Limited / India		YES	YES
34	Kalpataru Power Transmission Limited / India		YES	YES
35	PWH (THAILAND) CO., LTD. / Thailand		YES	YES
36	DEMCO Public Company Limited / Thailand		YES	YES
37	Italthai Engineering Co., Ltd. / Thailand		YES	YES
38	Sieyuan Electric Co., Ltd. / China		YES	YES
39	Black & Veatch (Thailand) Ltd. / Thailand		YES	YES
40	PESTECH Sdn. Bhd. / Malaysia		YES	YES
41	Shandong Taikai Power Engineering Co., Ltd. / China		YES	YES
42	SC-ST-BYP JOINT VENTURE COMPANY LIMITED / Thailand		YES	YES
43	China CAMC Engineering CO., LTD. / China		YES	YES
44	Kinden Corporation - Kinden (Thailand) Co., Ltd. Joint Venture (Kinden Corporation / Japan and Kinden (Thailand) Co., Ltd. / Thailand)		YES	YES
45	The Joint Venture of SRI and PWH (Sri U-Thong Limited / Thailand and PWH (Thailand) Company Limited / Thailand)		YES	YES
46	The Consortium of Kinden Corporation and Perfect Engineering Service Public Co., Ltd. (Kinden Corporation / Japan and Perfect Engineering Service Public Co., Ltd. / Thailand)		YES	YES
47	The Consortium of SCL-STC and ITE (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Company Limited / Thailand and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
48	The Consortium of Siemens Energy Limited and Sinkarnchang Company Limited (Siemens Energy Limited / Thailand and Sinkarnchang Company Limited / Thailand)		YES	YES
49	The Consortium of Siemens Energy Limited and Standard Performance Company Limited (Siemens Energy Limited / Thailand and Standard Performance Company Limited / Thailand)		YES	YES
50	JOINT VENTURE OF SCL, STC AND XD (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Co., Ltd. / Thailand and Xian Electric Engineering Co., Ltd. / China)		YES	YES
51	JOINT VENTURE OF SINOHYDRO CORPORATION LIMITED AND SINOHYDRO (THAILAND) CO., LTD. (Sinohydro Corporation Limited / China and Sinohydro (Thailand) Co., Ltd. / Thailand)		YES	YES
52	LOXLEY & LPS CONSORTIUM (LOXLEY PUBLIC COMPANY LIMITED / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)		YES	YES
53	The consortium of DEMCO Public Company limited and KINDEN Corporation (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan)		YES	YES
54	The Consortium of Shanghai Electric Group Company Limited & Future Electrical Control Company Limited (Shanghai Electric Group Company Limited / China and Future Electrical Control Company Limited / Thailand)		YES	YES
55	Consortium of ITE - NCPE (Italthai Engineering Co., Ltd./ Thailand and North China Power Engineering Co., Ltd. of China Power Engineering Consulting Group / China)		YES	YES

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 ฝ่ายวิศวกรรมระบบส่ง กฟผ.



EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
56	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Hyundai Electric & Energy Systems Company Limited (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan and Hyundai Electric & Energy Systems Company Limited / Korea)		YES	YES
57	Grid Solutions (Thailand) Limited / Thailand		YES	YES
58	CGGC-PG Joint Venture / China		YES	YES
59	Consortium of Pinggao Group Co., Ltd. and Italthai Engineering Co., Ltd. (Pinggao Group Co., Ltd. / China and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
60	Consortium of Linxon India Private Limited and Linxon (Thailand) Limited (Linxon India Private Limited / India and Linxon (Thailand) Limited / Thailand)		YES	YES
61	NARI GROUP CORPORATION / P.R. China		YES	YES
62	Joint Venture of STC-BYP (Sinohydro (Thailand) Co., Ltd. / Thailand and Benyapha Power Line Co., Ltd. / Thailand)		YES	YES
63	SINOHYDRO (THAILAND) CO., LTD. / Thailand		YES	YES
64	The Consortium of Kalpataru Power Transmission Limited and TSPG Company Limited (KPTL-TSPG Consortium) (Kalpataru Power Transmission Limited / India and TSPG Company Limited / Thailand)		YES	YES
65	Consortium of NARI GROUP CORPORATION and NARI (THAILAND) Co., Ltd. (NARI GROUP CORPORATION / P.R. China and NARI (THAILAND) Co., Ltd. / Thailand)		YES	YES
66	Consortium of Secco H.V. and Nari Group Corporation (Secco H.V. Co., Ltd. / Thailand and Nari Group Corporation / P.R. China)		YES	YES
67	The consortium of Grid Solutions (Thailand) Ltd. and J.R.W. Utility PLC. (Grid Solutions (Thailand) Limited / Thailand and J.R.W. Utility Public Company Limited / Thailand)		YES	YES
68	CONSORTIUM OF LARSEN & TOUBRO LIMITED AND EPCC ENGINEERING CO., LTD. (LARSEN & TOUBRO LIMITED / India and EPCC ENGINEERING CO., LTD. / Thailand)		YES	YES
69	CONSORTIUM OF LARSEN & TOUBRO LIMITED AND PPPO COMPANY LIMITED (LARSEN & TOUBRO LIMITED / India and PPPO COMPANY LIMITED / Thailand)		YES	YES
70	The Consortium of Shanghai Electric Group Company Limited & Yipintsoi Energy Company Limited (Shanghai Electric Group Company Limited / P.R. China and Yipintsoi Energy Company Limited / Thailand)		YES	YES
71	The Consortium of Transrail Lighting Limited, Shyama Power India Limited and CS Power and Project Company Limited (Transrail Lighting Limited / India and Shyama Power India Limited / India and CS Power and Project Company Limited / Thailand)		YES	YES
72	Hyundai Heavy Industries Co., Ltd. / Korea			YES
73	LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand			YES
74	Future Electrical Control Company Limited / Thailand			YES
75	NARI Group Corporation / China			YES
76	Consortium ITE and HHI (Italthai Engineering Co., Ltd. / Thailand and Hyundai Heavy Industries Company Limited / Korea)			YES
77	The Consortium of Demco Public Co., Ltd. Perfect Engineering Service Public Co., Ltd. And Demco Power Co., Ltd. (Demco Public Company Limited / Thailand, Perfect Engineering Service Public Co., Ltd. / Thailand and Demco Power Co., Ltd. / Thailand)			YES



Handwritten signature in blue ink.

EGAT Accepted Bidders List for Supply and Construction of Substations

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
78	The Consortium of A2 Technologies Vietnam Co., Ltd. and A2 Technologies Co., Ltd. (Thailand) (A2 Technologies Vietnam Co., Ltd. / Vietnam and A2 Technologies Co., Ltd. (Thailand) / Thailand)			YES
79	Gunkul Power Development Company Limited / Thailand			YES
80	Secco H.V. Co., Ltd. / Thailand			YES
81	Larch & Laurel Co., Ltd. / Thailand			YES

Note

- 1 **Additionally, any bidders in the EGAT Accepted Bidders List for Supply and Construction of Substations of the same voltage level are allowed to form a new consortium or joint venture with other bidders in the accepted list. All parties of the new consortium or joint venture shall be accepted at the voltage level of the proposal.**
- 2 **The Bidders listed in EGAT Accepted Bidders List for Supply and Construction of Substations are in accordance with the requirements set forth in the Eligibility of Bidder No. EB-PQ-SUB-01. In bid evaluation, EGAT will not be bound to accept the bidder in EGAT Accepted Bidders List for Supply and Construction of Substations. EGAT reserves the right to accept the bidder considering the conformity of the bid requirements.**

Bid No. IPPP-S-01

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 รับรองสำเนาโดย ทพอ-ส. กสส-ส. อวส.
 ก่อนนำไปใช้งาน
 ต้องตรวจสอบ Revision ล่าสุด
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

1 พฤศจิกายน 2566

EGAT Accepted Coupling Capacitor Voltage Transformer List

Description	Manufacturer / Country	Type/Model
500 kV CCVT	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	DFK-525
	GE GRID SOLUTIONS (U.S.) ALSTOM GRID LLC / U.S.A.	OTCF 550
	TRENCH / Canada	TEIRF 500 A
	NISSIN ELECTRIC CO., LTD. / Japan	IM550
230 kV CCVT	HITACHI ENERGY SWEDEN AB / Sweden	CPB 245
	GE GRID SOLUTIONS (U.S.) ALSTOM GRID LLC / U.S.A.	OTCF 245
	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	DFK-245
	NISSIN ELECTRIC (WUXI) CO., LTD. / China	WVL230-5H
	TRENCH ITALIA S.R.L. CAIRO MONTENOTTE / Italy	TCVT 245
	EMEK ELEKTRIK ENDUSTRISI A.S. / Turkey	KGT-245
115 kV CCVT	HITACHI ENERGY SWEDEN AB / Sweden	CPB 123
	GE GRID SOLUTIONS (U.S.) ALSTOM GRID LLC / U.S.A.	OTCF 123
	ELECTROTECNICA ARTECHE HERMANOS, S.L. / Spain	DDB-123
	EMEK ELEKTRIK ENDUSTRISI A.S. / Turkey	KGT-125
	NISSIN ELECTRIC (WUXI) CO., LTD. / China	WVL115-10H
	TRENCH ITALIA S.R.L. CAIRO MONTENOTTE / Italy	TCVT 123

Bid

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 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

1 พฤศจิกายน 2566

EGAT Accepted Disconnecting Switch List

Description	Manufacturer / Country	Type/Model	Type of Mechanism
550 kV, 4,000 A air switch (Main blade: Motor operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	STC	CD101
	Grid Solution S.p.A. / Italy	S3CD550/4000	CMM
	Hapam B.V. / The Netherlands	SSBIII-550	MT150
550 kV, 4,000 A, air switch with grounding blade (Main blade: Motor operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	STC-E	CD201
	Grid Solution S.p.A. / Italy	S3CDT550/4000	CMM for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-550	MT150 for DS and HAC for ES
245 kV, 4,000 A, air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solutions / Italy	S3CD245/4000	CML
	Hapam B.V. / The Netherlands	SSBIII-245	HAC
245 kV, 4,000 A, air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Grid Solution S.p.A. / Italy	S3CDT245/4000	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-245	HAC for DS and ES
245 kV, 3,150 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Hapam B.V. / The Netherlands	SSBIII-245	HAC
	Grid Solution S.p.A. / Italy	S3C245/3150	CML
245 kV, 3,150 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E Special	CM210
	Hapam B.V. / The Netherlands	SSBIII-AM-245	HAC for DS and ES
	Grid Solution S.p.A. / Italy	S3CT245/3150	CML for DS and ES

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รับรองสำเนาโดย วิศวกร-ส.กตส.ลวส.
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ต้องตรวจสอบ Revision คำพูด
ฝ่ายวิศวกรรมระบบส่ง กฟผ.



EGAT Accepted Disconnecting Switch List

Description	Manufacturer / Country	Type/Model	Type of Mechanism
123 kV, 3,150 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solution S.p.A. / Italy	S3C123/3150	CML
	Hapam B.V. / The Netherlands	SSBIII-123	HAC
123 kV, 3,150 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E	CM210
	Grid Solution S.p.A. / Italy	S3CT123/3150	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-123	HAC for DS and ES
123 kV, 2,000 A air switch (Main blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB	CM110
	Grid Solution S.p.A. / Italy	S3C123/2000	CML
	Hapam B.V. / The Netherlands	SSBIII-123	HAC
123 kV, 2,000 A air switch with grounding blade (Main blade: Manually operated, Grounding blade: Manually operated)	Coelme Costruzioni Elettromeccaniche SpA / Italy	TCB-E Special	CM210
	Grid Solution S.p.A. / Italy	S3CT123/2000	CML for DS and ES
	Hapam B.V. / The Netherlands	SSBIII-AM-123	HAC for DS and ES

Bid No. 1999-5-51

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 ต้องตรวจสอบ Revision ล่าสุด
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

1 พฤศจิกายน 2566

EGAT ACCEPTED FAULT RECORDING SYSTEM LIST

Accepted Type	Manufacturer
IDM+	Qualitrol
M871	GE
7KE85 (*)	Siemens
TESLA 4000 (*)	ERL Phase
TR 2100	Rochester (RIS)
TR 3000 (**)	

Remarks

- (*) Applicable to IEC 61850 for both station bus and process bus with the certification issued by the third party laboratory and specifying that the said FRS conforms to "IEC 61850 edition 2 parts 6, 7-1, 7-2, 7-3, 7-4, and 8-1".
- (**) Applicable to IEC 61850 only for station bus with the certification issued by the third party laboratory and specifying that the said FRS conforms to "IEC 61850 edition 2 parts 6, 7-1, 7-2, 7-3, 7-4, and 8-1".

Notes

1. The procedures for being listed in EGAT ACCEPTED FAULT RECORDING SYSTEM LIST are specified in the EGAT's Pre-Qualification (PQ) process, of which the details can be provided by Transmission System Engineering Division on request.
2. If any types of FRS in the list are planned to discontinue the manufacturing, the manufacturer or the representative is responsible for informing EGAT at least 1 year before the unavailable date.



เอกสารควบคุม

รับรองสำเนาโดย ทพอ.ส.กสส.ส. อวส.

ก่อนนำไปใช้งาน

ต้องตรวจสอบ Revision ล่าสุด

ฝ่ายวิศวกรรมระบบส่ง กฟผ.

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
550 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-3	550	4000	63			✓	Horizontal	Pfiffner/Switzerland	Trench/Germany Ritz/Germany Pfiffner/Switzerland	LAPP/Germany XD/China
	Siemens AG / Germany	8DQ1P2	550	4000	50	✓			Horizontal	Trench/Germany	Trench/Germany	HSP/Germany
	GE Grid Solutions / France	T155	550	4000	50	✓			Horizontal	Pfiffner/Switzerland ENPAY/Turkey	GE/France Ritz/Germany	PPC/Austria Ceralep/France
	Hitachi Ltd. / Japan	IFT	550	6300	63		✓		Horizontal	Hitachi/Japan Meiden Chemical/Japan	Nissin/Japan Toko/Japan	N.G.K./Japan
	HD Hyundai Electric Co., Ltd. / Korea	550SR	550	4000	63		✓		Horizontal	Daeyoung/Korea Hyundai/Korea	Nissin/Japan TOKO/Japan Trench/Germany Nissin/China Sieyuan/China	PPC/Germany PPC/Sweden TYCO/Switzerland N.G.K/Japan
	Mitsubishi Electric Corporation / Japan	500-GPS	550	4000	50	✓			Horizontal	Melco/Japan	Melco/Japan	N.G.K./Japan
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZF15-550	550	4000	63		✓		Horizontal	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China



Bid No. IPPP-S-2566

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1 พฤศจิกายน 2566

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
245 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-14	245	4000	63 50			✓	Horizontal	Pfiffner/Switzerland ABB/Czech	Pfiffner/Switzerland Trench/Germany	LAPP/Germany XD/China
	GE Grid Solutions / France	B105	245	4000	50	✓			Horizontal	ENPAY/Turkey ALCE/Turkey GE/France	GE/France	PPC Insulators/Austria Ceralep/France GE/France
	Hyosung Heavy Industries Corporation / Korea	HSG-305B	300	4000	50	✓			Horizontal	Hyosung/Korea	Nissin/Japan Toko/Japan Siyuan/China Nissin/China Toko/Korea	LAPP/Germany Huaxin/China XD/China
	Xian XD Switchgear Electric Co., Ltd./ China	ZF9-252	245	4000	50	✓			Vertical	XD/China Nanjing Zhida Electric/China	XD/China	XD/China
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-252	245	4000	50	✓			Horizontal	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	GE High Voltage Switchgear (Suzhou) Co., Ltd / China	B105	245	4000	50	✓			Horizontal	Nanjing Zhida / China	Suzhou TOKO / China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	HD Hyundai Electric Co., Ltd. / Korea	300SR	245	4000	50	✓			Horizontal	Daeyoung/Korea Hyundai/Korea	Nissin/Japan TOKO/Japan Trench/Germany	PPC/Germany PPC/Sweden TYCO/Switzerland N.G.K/Japan LAPP/Germany Zapel/Poland

Bid No. P/PPS/01

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1 พฤศจิกายน 2566



EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Alignment of Circuit Breaker	Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring		CT	VT	Bushing (Porcelain)
										Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
123 kV, 3150/2000 A, 40 kA GIS Main bus 3150 A Feeder 2000 A	ABB High Voltage Switchgear (Xiamen) Co., Ltd. / China	ELK-04	145	3150	40			✓	Vertical	Pfiffner/Switzerland Sihui/China ABB Jingke / China	Pfiffner/Switzerland Sieyuan/China ABB Jingke / China	XD/China
	HD Hyundai Electric Co., Ltd. / Korea	145SP-1	123	3150	40	✓			Vertical	Dongwoo/Korea	Nissin/Japan Nissin/China Sieyuan/China	LAPP/Germany
	Hyosung Heavy Industries Corporation / Korea	HSG-144D	145	3150	40	✓			Vertical	Hyosung / Korea Samnung/Korea	Nissin/Japan Sieyuan/China Nissin/China Toko/Korea	LAPP/Germany Huaxin/China XD/China
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-145	145	3150	40	✓			Vertical	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	ILJIN Electric Co., Ltd. / Korea	IJS 1440	145	3150	40	✓			Vertical	Samnung / Korea	Toko Takaoka Korea / Korea	Lapp / Romania
	TOSHIBA Energy Systems & Solutions Corporation/ Japan	G3A-b	145	3150	40	✓			Vertical	TOSHIBA / Japan	TOSHIBA / Japan	TOSHIBA / Japan
	Shanghai Sieyuan High Voltage Switchgear Co., Ltd. / China	ZF28A-145	145	3150	40	✓			Vertical	Shanghai Sieyuan High Voltage Switchgear Co., Ltd. / China	Jiangsu Sieyuan Hertz Co.,Ltd. / China	XD/China
	Siemens High Voltage Switchgear Co., Ltd. Shanghai / China	8DN8	123	3150	40	✓			Vertical	Sihui/China	Nissin/China Sieyuan/China	XD/China

Note. The Equipment listed in EGAT Accepted Gas Insulated Switchgear List are in accordance with the requirements set forth in the Eligibility of Equipment No. EB-PQ-GIS-01. In bid evaluation, EGAT will not be bound to accepted the equipment in EGAT Accepted Gas Insulated Switchgear List. EGAT reserves the right to accept the equipment considering the conformity of the bid requirements.

Bid No. 10-11-PP-53

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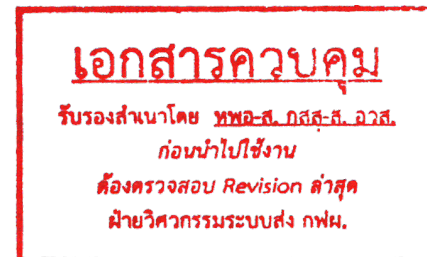
1 พฤศจิกายน 2566

EGAT ACCEPTED MANUFACTURER LIST FOR
CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER)

Description	Manufacturer	Designed by
500 kV Control and Protection Panel	Hitachi Energy (Thailand) Limited	Hitachi Energy (Thailand) Limited
	Precise System and Project Co., Ltd.	Precise System and Project Co., Ltd.
	U-tah Industry Limited Partnership	U-tah Industry Limited Partnership
	SCI Electric Public Company Limited	Siemens Limited
230 kV and below Control and Protection Panel	Hitachi Energy (Thailand) Limited	Hitachi Energy (Thailand) Limited
	C&T Metal Products Co., Ltd.	Easun Reyrolle Limited, India
	Precise System and Project Co., Ltd.	Precise System and Project Co., Ltd.
	U-tah Industry Limited Partnership	U-tah Industry Limited Partnership
	SCI Electric Public Company Limited	SCI Electric Public Company Limited
	Timpano Electrical Co., Ltd.	Timpano Electrical Co., Ltd.
	Mantra Switchgear Co., Ltd.	Siemens Limited

Notes

- The procedures for being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) can be provided by Transmission System Planning and Project Division on request.
- The control and protection panel shall be manufactured and designed by the manufacturer/company written in the same row.

1 พฤศจิกายน 2566

EGAT ACCEPTED MANUFACTURER LIST FOR FAULT RECORDING SYSTEM

Description	Manufacturer / Country
Fault Recording System	Qualitrol / UK
	Siemens / Germany
	Rochester / USA
	GE / USA
	ERL Phase / Canada

Bid No. IPPP-S-01

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1 พฤศจิกายน 2566

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EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY

Description	Manufacturer / Country
Protective Relay	ABB / Sweden, Switzerland, USA
	GE / USA, Canada, Spain, UK
	SEL / USA
	Siemens / Germany, UK
	Toshiba / Japan, Vietnam
	Schneider Electric / France, UK
	ZIV / Spain
	INGETEAM / Spain
	NR Electric / China
	Mitsubishi / Japan
	Protecta / Hungary
	Arcteq / Finland
	Sifang / China



Bid No.

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EGAT Accepted Power Circuit Breaker List

Description	Manufacturer / Country	Equipment Rating			Type/Model	1&3 pole	3 pole	Type of Mechanism
		kV	A	kA				
550 kV, 4,000 A, 50 kA GCB (Class C1)	Hitachi Energy Sweden AB / Sweden	550	4000	63	HPL550B2	Yes	Yes	BLG1002A (Spring)
	GRID SOLUTIONS SAS / France	550	4000	50	GL317	Yes	Yes	FK3-4 (Spring)
	Siemens Energy High Voltage Circuit Breaker Co., Ltd. Hangzhou / China	550	5000	63	3AP2FI-550kV	Yes	Yes	FA5 (Spring)
245 kV, 4,000 A, 50 kA GCB (Class C1)	Hitachi Energy Sweden AB / Sweden	245	4000	50	LTB245E1	Yes	Yes	BLK222 (Spring)
							Yes	BLG1002A (Spring)
	GRID SOLUTIONS SAS / France	245	4000	50	GL314	Yes	Yes	FK3-1 (Spring)
							Yes	FK3-4 (Spring)
	Jiangsu Rugao High Voltage Electric Apparatus Co. Ltd. / China	245	4000	50	LW58-252	Yes	Yes	SRCT36E (Spring)
							Yes	SSCT33 (Spring)
	Siemens Energy High Voltage Circuit Breaker Co., Ltd. Hangzhou / China	245	4000	50	3AP1FI-245kV	Yes	Yes	FA2 (Spring)
		245	4000	50	3AP1FG-245kV		Yes	FA4 (Spring)
123 kV, 3,150 A, 40 kA GCB (Class C1)	Hitachi Energy Sweden AB / Sweden	145	3150	40	LTB145D1/B		Yes	BLK222 (Spring)
	ABB High Voltage Switchgear Co., Ltd. / China	145	3150	40	LTB145D1/B		Yes	BLK222 (Spring)
	GE GRID GMBH / Germany	145	3150	40	GL312F1/4031P		Yes	FK3-1 (Spring)
	Siemens Limited / India	145	3150	40	3AP1FG-145kV		Yes	FA2 (Spring)
	Jiangsu Rugao High Voltage Electric Apparatus Co. Ltd. / China	145	4000	40	LW36-145		Yes	SRCT36E (Spring)
	Siemens High Voltage Circuit Breaker Co., Ltd. Hangzhou / China	145	3150	40	3AP1FG-145kV		Yes	FA2 (Spring)

Note. The Equipment listed in EGAT Accepted Power Circuit Breaker List are in accordance with the requirements set forth in the Eligibility of Equipment No. EB-PQ-CB-01. In bid evaluation, EGAT will not be bound to accepted the equipment in EGAT Accepted Power Circuit Breaker List. EGAT reserves the right to accept the equipment considering the conformity of the bid requirements.

Bid No.

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1 พฤศจิกายน 2566

EGAT Accepted Surge Arrester List

Description	Manufacturer / Country	Type / Model
396 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQB-396HY
	Hubbell Power Systems Inc. / USA	VN/215516-9141
	Hitachi Energy Sweden AB / Sweden	EXLIM P396-GH550
	Tridelta Meidensha GmbH / Germany	SB 396/20.4-I
192 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQC-192VY
	Siemens Aktiengesellschaft / Germany	3EP4 192-2PE32
	Hubbell Power Systems Inc. / USA	MVN192BB152AA
	Hitachi Energy Sweden AB / Sweden	EXLIM Q192-EH245
	Tridelta Meidensha GmbH / Germany	SB 192/10.3-0
108 kV SA (Porcelain)	Toshiba Hamakawasaki Factory / Japan	RVLQC-108VY
	Siemens Aktiengesellschaft / Germany	3EP4 108-2PE31
	Hubbell Power Systems Inc. / USA	MVN108BB088AA
	Hitachi Energy Sweden AB / Sweden	EXLIM Q108-EH123
	Tridelta Meidensha GmbH / Germany	SB 108/10.3-0

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1 พฤศจิกายน 2566

SCOPE OF WORK

H-1. General

<u>No.</u>	<u>Substation</u>	<u>Page</u>
1.	500 kV PHANOM SARAOKHAM SUBSTATION (GIS)	
	- GENERAL	H1-1
	- ELECTRICAL PART	H1A-1
	- CONTROL AND PROTECTION PART	H1B-1
	- COMMUNICATION PART	H1C-1
	- CIVIL AND ARCHITECTURAL PART	H1D-1
2.	500 kV PLAUK DAENG SUBSTATION	
	- GENERAL	H2-1
	- ELECTRICAL PART (NONE)	H2A-1
	- CONTROL AND PROTECTION PART	H2B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART	H2D-1
3.	500 kV WANG NOI SUBSTATION	
	- GENERAL (NONE)	-
	- ELECTRICAL PART (NONE)	-
	- CONTROL AND PROTECTION PART	H3B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART(NONE)	-

1. 500 kV Phanom Sarakham Substation

General

The new 500 kV GIS Substation is located at Tumbon Ko Khanun, Phanom Sarakham District, Chachoengsao Province. The new 500 kV Gas Insulated switchgear (GIS) is Breaker & A Half scheme. The GIS Modules shall be installed inside the new separately GIS building.

The Breaker & A Half scheme 500 kV Gas Insulated switchgear (GIS) have Four(4) diameters for Six(6) feeders. The Six(6) feeders of Breaker & A Half scheme at the new 500 kV GIS shall be provided for transmissions lines as follows :

- Two (2) feeders for 500 kV Lines No. 1 & 2 to **Burapa Power Generation Power Plant**
- Two (2) feeders for 500 kV Lines No. 1 & 2 to **Pluak Daeng Substation**
- Two (2) feeders for 500 kV Lines No. 1 & 2 to **Wang Noi Substation**

The Contractor shall supply equipment, perform construction and installation work necessary for completion of operation substation in accordance with the Contract Documents. The design work shall include, but not limited to, technical calculation, preparation of drawings, bill of materials for installation and construction work. For accomplishment of complete operational substation, Scope of Contractor's work shall include connection to all public utilities i.e. electrical power, water and drainage. Testing and commissioning of all equipment required to make the substation function properly.

Besides, all detailed engineering design work, calculations, drawing preparation, submission of backup data, test reports instruction books (and) , etc. shall be included.

- 1) As stated elsewhere in this bidding documents, the drawings included in the bidding documents except drawing mark "For Construction" are for bidding purposes only and shall not be used for execution of the work.
- 2) The submitted drawings which are incomplete/unacceptable, or are the bidding document copies with minor modifications shall be returned unmarked to the Contractor.
- 3) The drawings shall be furnished which provide all details required for thoroughly described equipment as well as installation methods and requirements. However, EGAT retains the right to request additional details if those furnished are perceived inadequate.
- 4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

ELECTRICAL PART

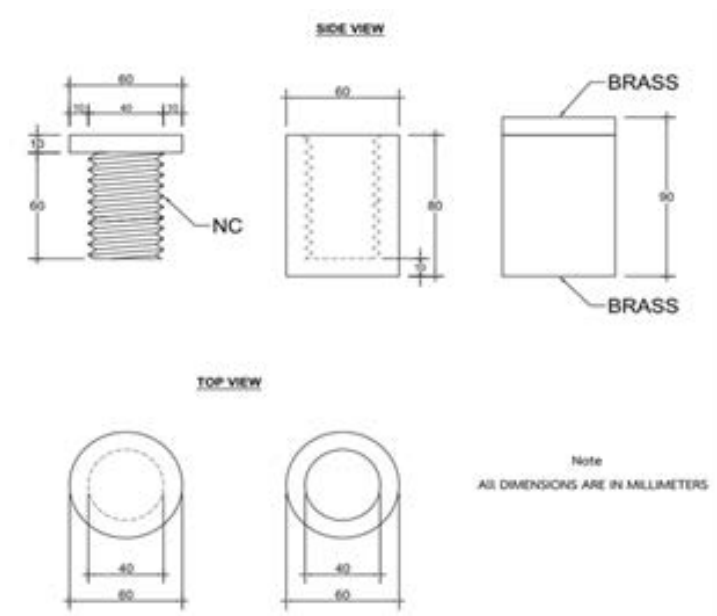
Schedule 1

Work included in this contract.

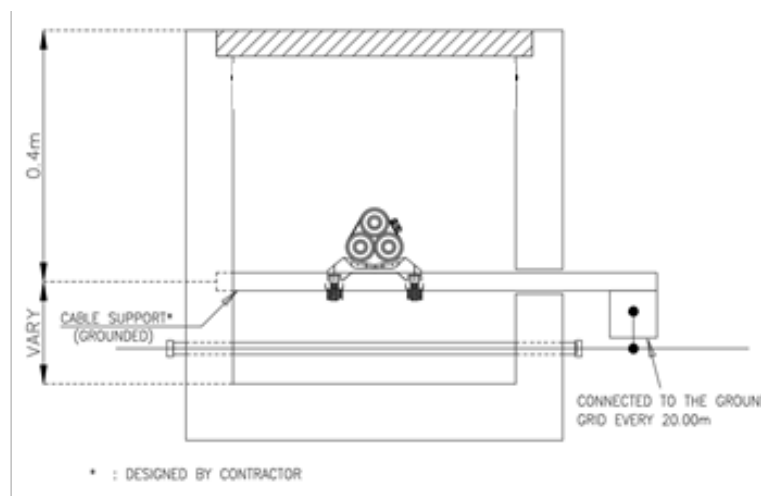
The work included in this contract to be performed by the contractor shall be as specified in the contract documents and as follows:

1. 500 kV Gas Insulated switchgear (GIS)

- 1.1. Design, supply and installation of equipment required for a complete the new 500 kV GIS & 22 kV-400/230 V power supply system.
- 1.2. Design, supply and installation of miscellaneous hardware required for as follows :
 - 1.2.1 The connection of 500 kV overhead line to the 70 MVar, 525 kV shunt reactor (SR1A & SR2A)
 - 1.2.2 The connection of the new 500 kV GIS air bushings to 500 kV overhead lines
 - 1.2.3 The grounding equipment and miscellaneous hardware for 70 MVar, 525 kV shunt reactor (SR1A & SR2A)
- 1.3. To meet EGAT's service continuity requirements, the GIS gas compartment can be designed as indicated in the single line diagram or can be designed differently under a condition that the design of the gas compartment shall fulfill the requirements as specified in the Specification.
- 1.4. Supply and installation of the marking pins for the referenced positions from the main bus shall be provided in the GIS building. The positions of the marking pins shall be shown on the drawings for future GIS extension and the quantity shall be not less than 3 sets. The making pins shall be made of brass or stainless steel that have the formation as follows :



- 1.5. The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.
- 1.6. The detachable walk way (Cat walk) for visual inspection shall be properly installed on each GIS module and removable service platform, removable ladder shall be provided for GIS inspection.
- 1.7. The feeder nameplates as well as phasing, device, and switching numbers shown on the GIS module shall be painted or mounted (detachable type) on the enclosure of GIS whichever is appropriate according to the instruction from EGAT GIS installation team. The nameplates color shall conform to Dwg.No.SE-ID-8-01, and their sizes and locations shall be appropriate for GIS module.
- 1.8. The sag and tension of phase wires and overhead ground wires shall be calculated and designed according to internationally-accepted standards by the Contractor and the said calculation shall be submitted to EGAT for approval.
- 1.9. Design, supply and installation of 22 kV XLPE cable system which comprises at least the following:
 - 1.9.1 The design and calculation of the 22 kV cable system shall conform to IEC or IEEE standards.
 - 1.9.2 The 22 kV XLPE cable shall be single-core with copper conductor.
 - 1.9.3 Design, supply and installation of the 22kV XLPE cables in a 22kV system complete from one end at the 22kV PEA connection point to the 22 kV Load break switch and the 22 kV Load break switch to the station service transformers KW1A, including cable trench, directed burial cable, cable supporting structures, cable spacers, cable cleats, cable termination supporting structures, cable terminations, miscellaneous hardware, link box, Sheath Voltage Limiter (SVL) (if applicable) and all related equipment.
 - 1.9.4 The 22kV XLPE cable shall be installed in **trefoil** formation.



The cable support structure shall be made of stainless steel, aluminum alloy or galvanized steel. The contractor shall design, supply and install the cable supporting structures that are suitable for cable cleats and cable system installation and their grounding. The ground shielding shall be directly connected to ground grid and shall not be connected with other equipment's grounding material before connecting to ground grid.

- 1.9.5 The minimum bending radius of the 22 kV XLPE cable shall be checked by Contractor for cable installation and cable trench design.
- 1.9.6 The Contractor shall design the 22 kV cable system such that one (1) 1/C-35 Sq.mm XLPE cable shall be able to carry the continuous current not less than **50 A** given that the ambient temperature is not less than 45 C°. The effect of solar radiation shall be considered if deemed technically necessary. The other parameters used in the design shall be practical, reasonable, operational and conform to IEC standard. The design report shall be submitted to EGAT for approval. The calculated continuous current rating shall be shown in the PSK-L-3 and PSK-L-5 drawing. The calculation shall be submitted to EGAT for approval.
- 1.9.7 The contractor shall calculate the sheath induced voltage in accordance with IEEE standard. The sheath standing voltage at every point on the metallic sheath of 22kV XLPE cable system shall be less than **60V** under the rated continuous current. The cable jacket shall be properly designed to be protected from overvoltage. Determine the specification for a surge voltage limiter (SVL) and PGCC cable if deemed technically necessary. The design report shall be submitted to EGAT for approval.
- 1.9.8 Calculate the mechanical force due to short-circuit current as per IEC standard. Determine the specification for cable cleats. For the calculation of forces caused by short-circuit currents, the peak short circuit current of **62.5kA** shall be used. The design report shall be submitted to EGAT for approval.
- 1.9.9 Design, supply and installation the equipment to protect the power cable from the surge and over-voltage.
- 1.9.10 The abnormal condition which occurs from the design and installation of 22 kV XLPE cables for example ferroresonance etc. shall be responsible by the Contractor.
- 1.9.11 Based on the design of 22kV XLPE cable system aforementioned, the contractor shall provide detailed drawings for the installation of this cable system including all related components.
- 1.9.12 The position and number of the cable cleats shall be calculated and determined by the contractor to withstand the electromechanical force from short circuit according to IEC standard.

2. Station service system

2.1 Design, supply and installation of station service system complete with integral accessories to provide a complete system operation. The station service system mainly consists of as follows:

- **500kVA**, 22,000-400/230V distribution transformer (KW1A)
- Load Center Unit Substation (LCUS)
- 22kV drop-out fuses
- 22kV Surge Arrester
- The dead end point structure (concrete pole structure CP-12) which the 22 kV equipment is installed on the concrete pole structure is located at the connecting point between EGAT and PEA. (see PSK-L-3-01-02&PSK-L-3-02-02 for detail)
- 22 kV XLPE power cable and cable termination
- 600V, 800A safety switches
- 22kV equipment, and AC&DC distribution boards, stationary batteries, battery chargers, power cables and all related equipment for the complete operation

2.2 Design, supply and installation of the equipment required for complete 22 kV power supply system, including raceways and 22 kV underground cable as well as 22 kV metering point.

2.3 The emergency generator set shall be designed for selectable manual and automatic start-up modes. The manual and automatic synchronization function shall be provided.

2.4 Design, supply and installation of equipment required for a complete 400/230 V power supply system. There are two main sources of power supply of this substation (station service) that include the following;

2.4.1 A 22 kV PEA line via at a 22 kV/400 V distribution transformer (KW1A).

2.4.2 The emergency generator set.

2.5 Design, supply and installation of emergency lighting system for the GIS building and control building in case of normal station service fails with the illuminance of **150 LUX** for at least **3 hours** as shown in figure below.

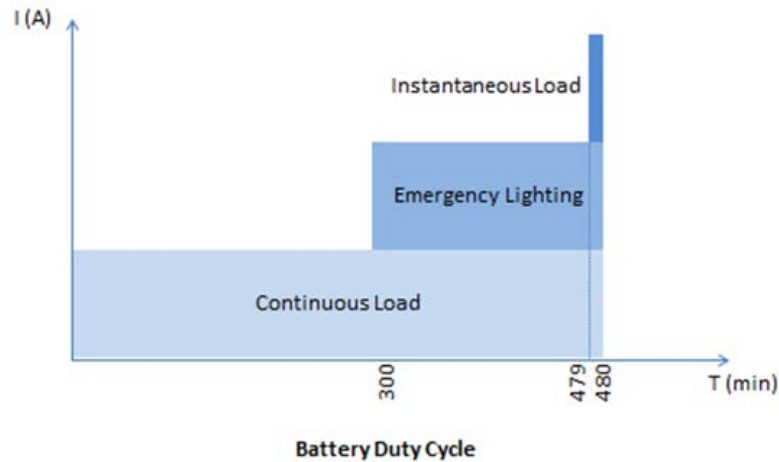
2.6 Design, supply and installation of the stationary battery, in which the battery is capable for delivering power to the control and protection for tripping all circuit breakers and emergency essential load at least 8 hours and emergency lighting at least 3 hours as shown in the figure below if normal station service fails. The capacity of the battery shall be designed by the contractor which the considered factor the influence the capacity of battery shall be as follows:

- The temperature correction factor is 1.0
- The design margin factor is 1.15
- The aging factor is 1.25

In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards. In addition, the size of the stationary battery shall be designed to support the operation of the new 500 kV GIS and future diameter as shown on the attached bidding document drawings. The calculation shall be

submitted to EGAT for approval. The size of battery shall not be less than as follows

a) 1200 Ah for 500 kV substation



2.7 The stationary battery shall be installed at the control building.

3. Grounding system

3.1 Design, supply and installation the grounding system of the following;

- 500kV GIS substation
- 500kV system
- 22kV system
- 500kV GIS Building
- Control Building
- Station service and low volt

3.2 The grounding conductor for the substation grounding system shall be of the 4/0 AWG bare copper wire type.

3.3 The ground grid conductors spacing under the building area shall be the same as the Switchyard.

3.4 Design, supply and installation of the grounding equipment and miscellaneous hardware for 500kV GIS substation, 500kV system, 22kV system and 22kV XLPE cable system.

3.5 Design, supply and installation of the grounding system of the isolating transformer. The grounding system of the isolating transformer shall be separated from that of the substation.

3.6 The contractor shall evaluate the price of ground grid based on the specified design for price reference as below :

3.6.1 The maximum ground grid conductor spacing (D0) shall be **4** meters.

3.6.2 The number of ground rod shall be **200** pieces.

- 3.7 The Contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.
- 3.8 The Contractor shall design a grounding grid based on the measured soil resistivity by hand calculation using the equations in IEEE-80 standard and submitted to EGAT for Approval. The parameters for grounding system calculation shall be used as follows :
- Fault current division factor (sf) value = **1**
 - Fault current (rms) = **50 kA**
 - Time duration of fault = **1 second**
- These parameters shall be used for determine the size of grounding conductor for the substation grounding system. If the ground conductor spacing calculated by hand (D1) is less than the grounding conductor spacing for reference (D0), the Contractor shall design a grounding grid by using the software. The certification of software shall be acceptable for commercial use.
- 3.9 The measurement of ground resistance at 500 kV substation shall be performed by the Contractor after completion of grounding system installation. Before the measurement, the overhead ground wire shall be disconnected from substation. The method of measurement shall follow the IEEE Std 81-2012, “IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System” or the latest versions. Then the result shall be submitted to EGAT.
- 3.10 All fence of the switchyard area shall be grounded. Although some area of the fence is same with the boundary fence or concrete fence, the metal part of that fence shall be also grounded.
- 3.11 Design and supply the grounding system of all facility system (both In switchyard area and Outside switchyard area). The grounding system of the outside switchyard area e.g. the living area, the guard house, the pump and water storage and etc shall be separate from the substation grounding system.

4. Lightning protection

- 4.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT’s design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) is to be used in calculation instead of Critical Flashover voltage (CFO) as follows :
- 1550 kV for 500 kV Substation
 - For 22 kV equipment, the stroke current of **2 kA** shall be used for the calculation.
- 4.2 For the design of lightning protection system for the 500 kV GIS building and control building, the lightning protection level (LPL) shall be used level 1 for calculation and the overhead ground wire is not permitted. Air terminal rods installed at the roof shall be used instead.
- 4.3 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

5. Facility system

- 5.1 Outdoor facility system (Switchyard area)
 - 5.1.1 Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting, fence lighting, access road lighting, sign board lighting, lighting relay panel, raceways, and wiring cables for lighting circuits.
 - 5.1.2 The lamps for outdoor facility lighting system shall be **LED** type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation.
- 5.2 Indoor facility system (Switchyard area)
 - 5.2.1 Design, supply and installation of the facility system which mainly consists of lighting system, grounding system, power supply, fire alarm and protection system, and ventilation system, air-conditioning system, and telephone & LAN system in the 500 kV GIS building and control building. All cable wiring systems shall conform to NEC and IEC standards or internationally-accepted standards.
 - 5.2.2 The lamps for indoor facility lighting system shall be **LED** type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the LED lamp circuit shall be supplied by 2 - 3 manufacturers. The power factor of the LED lamps shall be more than 0.9.
 - 5.2.3 All steel accessories e.g. lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.
- 5.3 Outdoor facility system (Outside the switchyard area e.g. the living area, the guard house and etc.)
 - 5.3.1 Design, supply and installation of a lighting system at outside the switchyard area e.g. the living area, the guard house, the pump and water storage and etc. The lighting system is complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of the access road lighting, sign board lighting, raceways, and wiring cables for lighting circuits.
 - 5.3.2 Design, supply and installation of the equipment required for complete 400/230V power supply system, including raceways and underground cable all of the facility circuits, from Isolating transformer to a final load.
 - 5.3.3 Design, supply and installation of equipment required for a complete 400/230V power supply system. The power supply system mainly consists of the Isolating transformer, Power box (PRB panel), power cables and all complete with related equipment as per detail in PSK-L-3-01-02 and PSK-L-3-02-02 drawing.
 - 5.3.4 The lamps for outdoor facility lighting system shall be **LED** type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation.
 - 5.3.5 Design, supply and installation of circuits for remote control and door phone system of the entrance gate. The control of the entrance gate shall be operated in both manual and remote-control modes which shall be controlled from both the control room and the guardhouse.

- 5.4 Indoor facility system (Outside the switchyard area e.g. the living area, the guard house and etc.)
- 5.4.1 Design, supply and installation of the facility system which mainly consists of lighting system, grounding system, power supply and ventilation system(if any) in the Guard house and the living area ; the substation operator house. All cable wiring systems shall conform to NEC and IEC standards or internationally-accepted standards.
- 5.4.2 The lamps for indoor facility lighting system shall be LED type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the **LED** lamp circuit shall be supplied by 2 - 3 manufacturers. The power factor of the LED lamps shall be more than 0.9.
- 5.4.3 All steel accessories e.g. lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.
- 5.5 The Facility System shall be designed to meet E.I.T. standards. The material of all related equipment shall be also accepted by TIS standards or internationally-accepted standards.
- 5.6 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated load current.
- 5.7 The voltage drop from the safety switch to the AC boards and from the AC boards to the load shall not exceed 2% and 3% respectively.
- 5.8 The voltage drop shall conform to EGAT's requirement and the calculation shall be submitted for approval.

6. Telecommunication system

- 6.1 Design, supply and installation of the telecommunication. The telecommunication tower shall be constructed and divided into appropriate portions which are painted white and orange alternately with the top and bottom portions being painted orange. The obstruction lighting system shall be controlled by automatic flash box (AFB) that gives 30-60 flashes per minute. The AFB shall be turned on and turned off by a photo-light switch. The lightning protection system for the telecommunication tower shall be calculated and designed by the contractor and the said calculation shall be submitted to EGAT for approval.

7. Grid-Connected Solar Photovoltaics (PV) Rooftop System

- 7.1 The Contractor shall design, supply, deliver, install, construct, test, commission and maintain the Grid-Connected Solar PV rooftop system, which shall be completed with all necessary accessories and minor items to facilitate the correct completion of the work. All requirements of relevant standards over these works shall be applied.
- The **60 kWp** Solar on Grid system with string inverters shall be installed at the rooftop of Control building. All the Solar PV rooftop system should be metered and the energy generated from the PV rooftop system shall be recorded.

General Requirement

- 7.1.1 The grid-connected rooftop solar power system shall consist of the following equipment/components but not limited to:
- Photovoltaic modules (PV modules) with grid-connected rooftop solar power support structure
 - Grid-connected inverter
 - DC combiner box
 - AC panel
 - DC fuse or DC circuit breaker & AC circuit breaker
 - DC & AC surge arrester
 - DC & AC cable
 - Conduit & Cable tray
 - DC & AC connector
 - Identification plate
 - Monitor equipment
 - Tools required for operation and maintenance
 - Any other item(s) that may be required to successfully commission, operation and maintain the grid-connected solar PV rooftop system.
- 7.1.2 All equipment/components parts used in the grid-connected solar PV rooftop system shall conform to the single line diagram and Technical Specifications of systems as shown in Dwg.No. SE-PV-0-01-01/01 & SE-PV-0-02-01/02 – 02/02 or internationally-accepted standards.
- 7.1.3 Submittals for documents, drawings, catalogs and manuals of equipment, warranty cards and spare parts shall conform to Technical Specifications of systems as shown in Dwg.No. SE-PV-0-02-01/02 – 02/02.
- 7.1.4 All documents and drawings shall be certified and signed by the Contractor's authorized senior professional engineers certified by Thailand's Council of Engineers.
- 7.1.5 The contractor or subcontractor shall have experience in executing at least two (2) contracts as the contractor for design and installation of Solar PV rooftop system in Thailand which has the capacity of PV system more than 60 kWp, with successful operation of at least two (2) consecutive years.
- 7.1.6 Testing and commissioning of the grid-connected solar PV rooftop system shall conform to the internationally-accepted standards.
- 7.1.7 Mentoring and training to EGAT's operating staff for operation and maintenance.
- 7.1.8 The insurance period for workmanship and Materials shall conform to Technical Specifications of systems as shown in SE-PV-0-02-01/02 – 02/02.

8. Others work

- 8.1 Supply and Installation of miscellaneous hardware required for suspension and station post insulators assembly.
- 8.2 Modification of Junction box supporting structure (JB003) for the installation of outdoor receptacle box (ORB1 and ORB2).
- 8.3 Modification of junction box supporting structure (JB001) for the installation of outdoor safety switch
- 8.4 Modification of junction box supporting structure (JB001) for the installation of Power box (PRB-1A, PRB-1B)

- 8.5 Modification of the guard house wall surface for the installation of Power box (PRB-2)
- 8.6 The power box PRB-1A, PRB-1B and PRB-2 are designed by the contractor.

9. Testing and commissioning

- 9.1 Testing and commissioning of all equipment required to make the substation function properly.

Work not included in this Contract. The Work not included in this Contract shall be as shown on the drawings and as follows :

1. Supply and installation of the 525 kV Shunt Reactors and their Neutral Reactors, except cabling from the control cubicle of the Shunt Reactors to the associated equipment.
2. The stringing work for the connection between the 500 kV substation take-off structures and the dead-end towers of the transmission lines.
3. Supply suspension and station post insulators.

CONTROL AND PROTECTION PART

Schedule 1

1. Work Included In This Contract for 500 kV PHANOM SARAOKHAM SUBSTATION

- 1.1. Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
 - Swing rack type protective relay switchboards
 - Transducer panel and Interposing relay panels
 - Marshalling panels for the remote terminal unit (Supplied by EGAT)
 - Marshalling panels for the fault recording system (Supplied by EGAT)
 - Marshalling panels for the control system (Supplied by EGAT)
 - Marshalling panel for the teleprotection
 - Synchronizing panels
 - Fault Recording System
 - Outdoor antenna and GPS receiver Panel
 - 400/230 VAC, 125 VDC power panel and 125 VDC Power distribution boards.
 - Cables and accessories as well as connection of cables among all of the boards and the associated equipment in order to complete the function of the control and protection system.
 - The interlock between the ground switch of a bus bar and the disconnecting switch that connects to the bus bar.
- 1.2. Design, supply, installation, test and commissioning of GPS Receiver and Ethernet Switch which is used as a reference time base to equipment in substation including sufficient number of Ethernet Switches, cables and accessories for interfacing the GPS Receiver with protection equipment, metering equipment and RTUs.
- 1.3. Design, installation, wiring, test and commissioning of the Remote Terminal Unit (RTU) and EGAT CCS/RTU Operator Console which are supplied by EGAT whereas configuration that include in this contract shall be fulfilled under EGAT's supervision. Cable and accessories for interfacing are supplied by Contractor.
- 1.4. Installation of the application software database, control function and display for the Computerized Control System, whereas the application software is supplied by EGAT. The installation shall be done by contractor under EGAT's supervision.
- 1.5. The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 1.6. The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

2. Work Not Included In This Contract

- 2.1. Supply of Remote Terminal Units (RTUs), Master Station Unit and application software.

COMMUNICATION PART

Schedule 1

Work included in this Contract.

1. Design, supply, and installation of the substation CCTV system which complies with the following qualifications:
 - 1.1 The system can be operated 24 hours a day.
 - 1.2 All cameras in the system shall be IP-camera type.
 - 1.3 At least 2 monitoring locations are required, the guardhouse and the control room.
 - 1.4 Installation space in the control room shall be prepared for rack cabinet(s) and CCTV operation desk(s) positions.
 - 1.5 In case of outdoor installation, all devices shall be weather-proof type which can be operated in all outdoor weather conditions, robust and durable.
 - 1.6 The bidder or a subcontractor shall be authorized by a representative or a branch office of manufacturer in Thailand.
 - 1.7 The bidder or a subcontractor shall be able to supply the spare parts of CCTV equipment in this contract for at least five (5) years starting from the date of EGAT acceptance.
 - 1.8 The calculation and required drawing according to the attached Bidding Document Specification shall be submitted to EGAT for approval.

CIVIL AND ARCHITECTURAL PART

Schedule 1

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of
 - 1.1 500 kV GIS Building.
 - 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
 - 1.1.2 RC and/or steel structure for roof.
 - 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation.
 - 1.1.4 Architecture of the whole building.
 - 1.1.5 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).
 - 1.1.6 500 kV GIS Building shall be designed with reference to Standard 500 kV GIS Building (Dwg.No.SD-GIS-9-02A) Equipment layouts and cable block out shall conform to electrical drawing Dwg.no.SE-GIS-0-01-01/01 and Dwg.No.PSK-S-7 and Dwg.No.PSK-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
 - 1.1.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
 - 1.1.8 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.
 - 1.1.9 GIB Block out of the building shall be filled with fire stop material-mortar or sealant or foam with 2 hr. fire resistance rate and install in accordance to the manufacturer's instruction.
 - 1.1.10 Building facilities
 - Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
 - Storm water drainage system.
 - Miscellaneous including grounding and labeling.
 - Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
 - Overhead traveling crane, of lifting capacity not less than 10 metric tons and wireless crane remote control. Overhead traveling crane shall have cat-walk for maintenance the equipment on ceiling and complete with 2 sides of guard rail along the cat-walk.
 - Overhead traveling crane shall comply with standard DIN EN 15011 standard.
 - Overhead traveling crane motors shall be dual speed or inverter and have operation speed as below.

Operating speed	High speed	Low speed
Cross travel	20 m/min	5 m/min
Long travel	32 m/min	5 m/min
Lifting	5 m/min	0.8 m/min

- Overhead traveling crane shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- Life line shall be installed above along runway rail of overhead traveling crane.
- Signboard on building.
- Lightning protection system.
- Emergency lighting system.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).

1.2 500/230 kV Control Building.

1.2.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.

1.2.2 RC and/or steel structure for roof.

1.2.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation.

1.2.4 Architecture of the whole building.

1.2.5 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).

1.2.6 500/230 kV Control Building shall be designed with reference to Standard drawing (Dwg.No.SD-CD-0-01A.) but size of building ,equipment layouts and cable block out shall conform to electrical drawing Dwg.No.PSK-S-7 and Dwg.No.TYP1A-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.

1.2.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.

1.2.8 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.

1.2.9 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
- Furniture as specified in architectural Drawings.
- Signboard on building and room name sign on each room.
- Lightning protection system.
- Emergency lighting system.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- The access floor system material in the Specification No.3001 (Civil and Architectural work) No.3001-10.8.3.5 Access Floor System (Raised Flooring System) shall be cancelled

1.3 3D Animation Specification

(1) 3D Animation Requirement

- a. A video of walk-through substation 3D animation. The video shall be not less than 3 minutes length, the resolution shall be not less than 4K (3840 x2163 pixels) with a frame rate of 60 fps, have an MP4 H.264 file type. The video shall also show these details.
 - Substation's name, in both Thai and English
 - A clear view of substation's entrance and signboard
 - Normal-eye-view (normal perspective) exterior scenes of the whole substation, including every building and electrical equipment
 - Bird 's-eye-view exterior scenes of the whole substation, including every building and electrical equipment
 - Normal-eye-view (normal perspective) interior scenes of every building in the substation, such as control room, GIS area, electrical room, relay room, switchgear room, etc.
 - Bird 's-eye-view interior scenes of GIS area, and any other rooms
- b. All relate 3D files used to create the 3D animation, both in their respective original file types and being exported as SketchUp (SKP) files

(2) 3D Animation Video Specification

- a) The contractor shall make use of any software with a software copyrights.
- b) A music, which is not subjected to copyrights, shall be added into the 3D animation.
- c) The contour, landscape and surrounding of the substation in the 3D animation shall also be created, based on the real existing surrounding.
- d) A model used to create the 3D animation shall follow these details:
 - Any components with a size of 0.008 cubic meters, or more, shall be created as a 3D model
 - All models shall be texture-mapped, with a color and texture close to the real surface of the material, equipment, or building they are based on.
 - The 3D animation shall make use of the renderings systems along with the ray tracing system to create a realistic light, in accordance to the real sun positioning in Thailand.

CIVIL WORK

2. Design and construction of
 - 2.1 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
 - 2.1.1 Shunt reactor foundation with oil containing pit.
 - 2.1.2 500kV GIB & GIS bushing structure and foundation.
 - 2.1.3 Take-off structure foundations.
 - 2.1.4 500kV Terminator support foundation.
 - 2.1.5 Cable tray for transformer, underground cable in HDPE duct.
 - 2.1.6 Telecommunication tower foundation.
 - 2.1.7 Steel structure foundation.
 - 2.1.8 Equipment structure foundation with sub trench (if required).
 - 2.2 Road and drainage system.
 - 2.3 Drainage system for cable trench.
 - 2.4 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
 - 2.5 Oil separator (volume of oil 25/62/85cu.m.). The contractor shall make an Oil separator design calculation in accordance with “IEEE STD-979-1994 (R2004)” (IEEE Guide for Substation Fire Protection), “IEEE STD-980-1994 (R2001)” (IEEE Guide for containment and control of oil spills in substation) and “Wastewater Quality Standard” of Pollution Control Department, Ministry of Natural Resources and Environment.
 - 2.6 Remote control (shall be controlled from either the control room or the guard house) and door phone system for main entrance gate.
 - 2.7 Cable trench.
 - 2.8 Cable trench for XLPE system with RC cover.
 - 2.9 Cable trench for XLPE system with steel cover.
 - 2.10 Prefabricated Guard house (moveable) with foundation.
 - 2.11 Generator Building
3. Construction of
 - 3.1 Steel structure foundation.
 - 3.2 Equipment structure foundation with sub trench (if required).
 - 3.3 Dead man hook for loading transformer
 - 3.4 Transformer loading.
 - 3.5 Cable trench.
 - 3.6 RC. Road.
 - 3.7 Oil separator.
 - 3.8 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
 - 3.9 Crushed rock surfacing.
 - 3.10 Wire mesh fence.
 - 3.11 Switchyard entrance gate (sliding).
 - 3.12 Concrete fence.
 - 3.13 Main entrance gate 8.00 m width (sliding).
 - 3.14 Signboard structure and foundation.
 - 3.15 Site office.
 - 3.16 Guard house.
 - 3.17 Garage house.
 - 3.18 Flag pole.
 - 3.19 Lamp post for fence and access road lighting LED type foundation.
 - 3.20 RC slab for storage area
 - 3.21 Duplex house

4. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
5. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
6. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.
7. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
8. EGAT's Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.
9. EGAT's Soil Investigation Report (attached to the Contract) is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
10. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
11. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
12. The Contract price shall be adjusted (added or reduced) in case that the soil investigation results to be used for the design works is different from the layout and standard drawings.
13. The Contractor shall perform a static load test for 500kV GIS Building and 500/230kV Control Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
14. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
15. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
16. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval.(if pad type foundation is required).
17. The Contractor shall remove all debris from construction material and other works in order to make the site clean and be in the condition acceptable to EGAT.
18. According to the Contract Document Section G-3 : Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows : the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

SOLAR ROOFTOP SYSTEM

19. Design and construction of

19.1 The solar rooftop system for 500/230 kV Control Building

- 19.1.1 The materials and equipment for solar rooftop system installation shall meet electrical criteria and standard qualifications in order to safely and properly install the system in buildings by professional installer.
- 19.1.2 The Contractor shall design safe access for routine inspection and maintenance and there shall be accessible paths between solar cell arrays for operators to safely and conveniently work.
- 19.1.3 The steel structure materials shall be hot dip galvanizing by following ASTM standard.
- 19.1.4 The tools of construction shall be both properly assembled and disassembled.
- 19.1.5 The equipment or mounting of the PV solar module attached to the construction shall be in proper size and shall be made from stainless steel or corrosion-prevented materials whose grade is not below 304 stainless steel or AL6005-T5 or equivalent.
- 19.1.6 The system installation shall provide strong, stable and proper mounting for the roof profile and provide a solid mount that does not penetrate the roof surface.
- 19.1.7 The PV module support structure shall be strongly, durably and securely fastened to the roof structure. All structural parts shall be designed for wind resistance not less than the maximum wind speed of tropical storm, and seismic (Earthquake) load requirement according to official declaration of Meteorology Department or regulations relevant to the area, if any.
- 19.1.8 Water supply system with cable and conduit for cleaning solar roof top of the building shall have automatic pump with pressure tank and PE water tank at ground floor. The automatic pump with pressure tank shall have sufficient capacity and delivery head. The Contractor shall submit water supply design calculation to EGAT for approval.

WATER SUPPLY AND FIRE PROTECTION SYSTEM

20. Design and construction of

20.1 Fire protection system for 500 kV GIS Building.

- 20.1.1 GIS Building shall consist of optical beam smoke detector and linear heat detector.
- 20.1.2 Fire protection system of GIS Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 500/230 kV Control/Relay Building. The installation practice shall be in accordance with the last edition of NFPA 72.
- 20.1.3 There shall be sounder and beacon on the roof of the building.
- 20.1.4 For air sampling smoke detector as shown on specification 3001- 10.13.2 part i item no.1, 7, 13 and 14 shall be changed to the new details as followings :
 - i. Air Sampling Smoke Detector.
 - (1) Shall consist of a high sensitivity typedetector, using light scatter technology.
 - (7) Detection system for all cabinet shall be omitted.

- (13) The minimum sensitivity settings for a single samplinghole are so that the detection system alarm at 1.5% obs/ft(4.95% obs/m).A sampling hole maximum coverage area is 400.0 sq.ft(37.2 sq.m).
- (14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.

20.1.5 Fire protection system, fire alarm system and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:

- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations

20.2 Fire protection system for 500/230 kV Control/Relay Building.

20.2.1 Control/Relay Building shall consist of Total Flood Clean Agent Fire Suppression System with heat detector, addressable type smoke detector and aspirated smoke detector.

20.2.2 Fire protection system of Control/Relay Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 500/230 kV Control/Relay Building. The installation practice shall be in accordance with the last edition of NFPA 72.

20.2.3 There shall be sounder and beacon on the roof of the building.

20.2.4 For system requirements for indoor fire protection system as shown on specification 3001-10.13.1 part e, item no.1 and 6 shall be changed to the new details as follow

(1) System description and operation : Supply and Installation of a Total Flood Clean Agent Fire Suppression System utilizing IG-100 shall cover all these zones :

- Zone 1: Equipment (Control/Relay) Room ;
- Zone 2: Electrical Room ;
- Zone 3: Under Raised Floor (If Required);
- Zone 4: Battery Room ;
- Zone 5: Cable Room (If required) ;
- Zone 6: Inert Gas Room
- Other zone (If required)

Each protected zone shall have its own set of IG-100 cylinders.

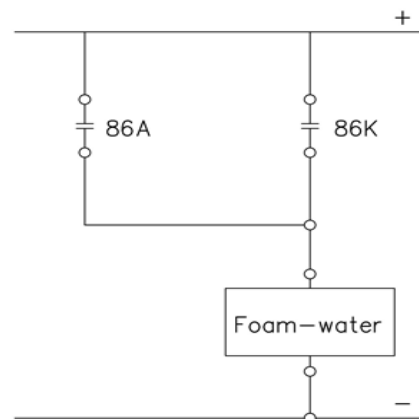
(6) Detectors shall be cross-zoned detection requiring 2 detectors to be in alarm before discharge. A zone of A or B of addressable smoke detector and a zone C of all ASD shall be crossed.

20.2.5 For air sampling smoke detector as shown on specification 3001- 10.13.2 part i item no.1, 7, 13 and 14 shall be changed to the new details as followings :

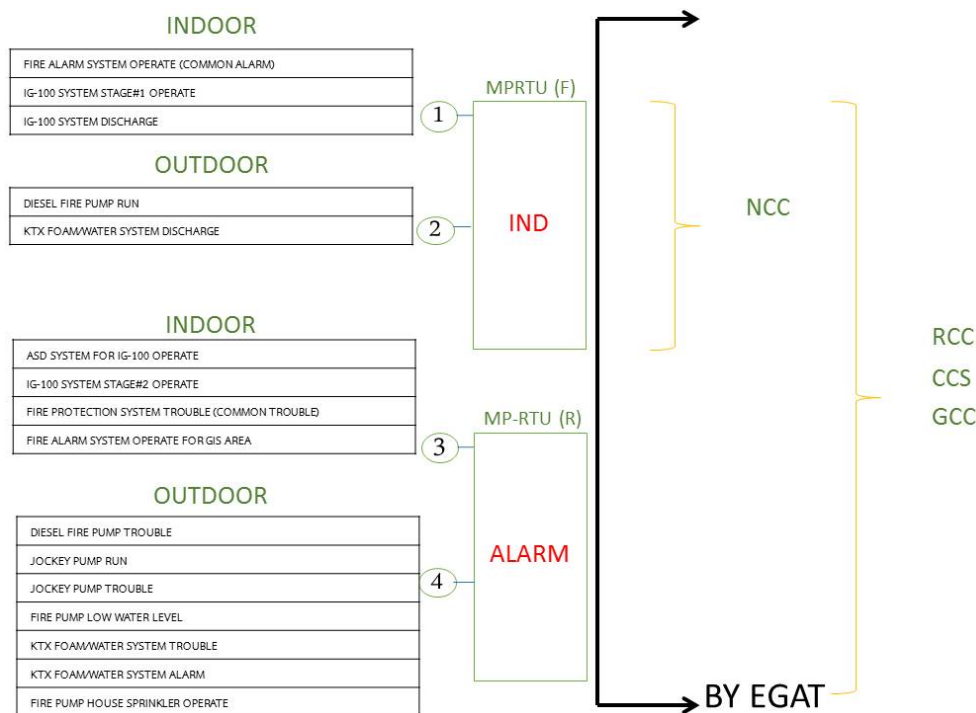
- i. Air Sampling Smoke Detector.
 - (1) Shall consist of a high sensitivity type detector, using light scatter technology.
 - (7) Detection system for all cabinet shall be omitted.
 - (13) The minimum sensitivity settings for a single sampling hole are so that the detection system alarm at 1.5% obs/ft (4.95% obs/m). A sampling hole maximum coverage area is 400.0 sq.ft (37.2 sq.m).
 - (14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.
- 20.2.6 Fire protection system, fire alarm system, installation room and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:
 - NFPA 2001: Clean Agent Fire Extinguishing Systems.
 - NFPA 70 : National Electrical Code.
 - NFPA 72 : National Fire Alarm Code.
 - NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
 - NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
 - IEEE Std 979: IEEE Guide for Substation Fire Protection
 - NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.
- 20.2.7 There shall be one control panel which controls fire detection system and IG-100 fire suppression system in the building.
- 20.2.8 There shall be a protective clear polycarbonate cover which can be immediately lifted or opened for all IG-100 manual release stations.
- 20.2.9 Battery room shall be furnished with an all-stainless steel, wall-mounted emergency eyewash. Contractor shall submit the catalog and proposed location of the eyewash to EGAT for approval.
- 20.3 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.
- 20.4 Fire protection system for the Transformer /Shunt Reactor : The Foam-water spray system shall comply with the following;
 - 20.4.1 Foam-water spray system: NFPA 13, NFPA 16 & NFPA 850
 - 20.4.2 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.
 - 20.4.3 Nozzles : NFPA 16 and as per Manufacturer's Recommendation
 - 20.4.4 Detection system : Air Expansion Linear Heat Detection System (LHB)
 - 20.4.5 Equipment for system : FM approved, UL Listings , Vds
 - 20.4.6 Foam-water spray system provided for Transformer/ Shunt Reactor shall be designed for a density of 10.2 litre/min-sq.m over the exposed surface at the Transformer/ Shunt Reactor.
 - 20.4.7 There shall be one linear heat detector box for each transformer / shunt reactor.
 - 20.4.8 There shall be one control panel for fire detection and foam/water spray system which controls all foam/water spray system of all protected transformers.
- 20.5 Fire Pump System. (conforming to NFPA 14, 20, 22, 24, 72).

- 20.6 250 cu.m water storage tank, fire pump, and jockey pump shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room in 500/230 kV Control/Relay Building. The installation practice shall be in accordance with the latest edition of NFPA 72.
- 20.7 There shall be one fire alarm system graphic annunciator at each building to enable responding personnel to identify the location of a fire accurately and to indicate the status of emergency equipment or fire safety functions.
- 20.8 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (fire pump houses, transformers, shunt reactors) at the building where control room locates.
- 20.9 Fire protection system circuits for buildings and switchyards : notification appliance circuits , and signaling line circuits , shall be class A circuit. Initiating device circuits can be class B circuit.
- 20.10 For Control System Logic as shown on specification 3001-13.4 item 4.1 shall be changed to the new detail as following

(4.1) In case of fire, heat detector and the tubular expansion detector first give alarm. If rate of rise/fixed temp in heat detector/tubular expansion detector sense fire condition, there shall be alarm in control room and the detected transformer and/Shunt Reactor shall be tripped before applying Foam-Water spray as the condition shown in the diagram below ;



- 20.11 For fire protection system monitoring system, contractor shall be responsible for procuring and installing a system comprising of monitoring and automatic alarm equipment; and for connecting the system to EGAT SCADA using Protocol Modbus or other Protocols that EGAT supports via TCP/IP port RJ45. When detectors detect smoke or heat, or equipment abnormality occurs, or fire protection system operates, the monitoring system will send alarm signals and record the even location, event date, start time, end time, and other necessary information. The event log must be appropriate for analyzing the cause of the event. The signals shall be verifiable and sent through (CCS) RTU and EGAT SCADA to NCC (National Control Center). The equipment shall be installed in control building or other location specified by EGAT. Signals of indoor fire protection system of each room and signals of outdoor fire protection system of each transformer / shunt reactor shall be sent to local CCS, GCC, RCC, and NCC as following details;



- 20.12 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 20.13 Water supply system.
- 20.14 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 20.15 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings :
- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO2) conforming to TIS 881 and/or dry chemical conforming to TIS 332 , capacity 10 lbs/set. The fitting accessories shall be provided.
 - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 20.16 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 20.17 Contractor shall warranty the fire protection system for one full year starting the date after contract final completion. Fire protection system shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation, at contractor's cost and expense.
- 20.18 Notwithstanding the expiration of any warranty period described in this contract, the warranty period for any fire protection system or equipment and maintenance period shall be extended by a period equal to the sum of any periods during the warranty period when such system or equipment cannot be used for the purposes for which they were intended or the delays in maintenance, starting from the date EGAT has given contractor notice.
- 20.19 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24" LED monitor which show the status of fire protection system in control room in 500/230 /Relay Building.
- 20.20 Fire pump house shall be protected by 2 hour fire-rated construction with appropriate ventilation system conformed to NFPA20. If there is any ventilation fan, it shall be explosion proof type.

- 20.21 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.
- 20.22 All firestops for penetrations shall be pre-formed block firestop / pillow firestop / sleeve firestop / pathway firestop, being able to be removed and reinstalled conveniently.
- 20.23 Fire detection devices in substation shall be as table below.

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms, Thyristor valve room	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	<ul style="list-style-type: none"> ▪ SD when environmental condition is acceptable. ▪ LHD when environmental condition is out of range for SD ▪ ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

Abbreviations

1. Heat detector, HD
 2. Addressable Spot-Type Photoelectric Smoke detector, SD
 3. Linear Heat Detector, LHD
 4. Aspirated smoke detectors, ASD
 5. Optical beam smoke detector, OBSD
- 20.24 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1
- 20.25 Underground water piping and fire protection pipe shall have indicator sign.
- 20.26 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).
- 20.27 All junction boxes or electrical equipment in rooms on ground floor shall be 1.2 m higher from room floor elevation.
- 20.28 Deep well system with water treatment system. The foundation and piling shall be designed by contractor and submit calculation to EGAT for approval.

21. Construction of
 - 21.1 Foam house.
 - 21.2 Fire pump house.
 - 21.3 Cabinets with 2x50 lbs wheel fire extinguisher.
 - 21.4 Water storage tank for fire protection system (capacity not less than 250 cu.m).
 - 21.5 Underground water tank 50 cu.m.
 - 21.6 Water tank tower 15cu.m.

2. 500 kV Plauk Daeng Substation

General

The existing Plauk Daeng Substation is a 500/230/115 kV conventional substation (AIS) located at Rayong Province. The existing 500 kV Line No.1 & 2 Plauk Daeng Substation to Wang Noi Substation shall be sectionalized to Phanom Sarakham Substation and replaced the existing 525 kV 110 MVar shunt reactor to be 525 kV 70 MVar.

The Contractor shall supply equipment, perform construction and installation work necessary for completion of operation substation in accordance with the Contract Documents. The design work shall include, but not limited to, technical calculation, preparation of drawings, bill of materials for installation and construction work. For accomplishment of complete operational substation, Scope of Contractor's work shall include connection to all public utilities i.e. electrical power, water and drainage. Testing and commissioning of all equipment required to make the substation function properly.

Besides, all detailed engineering design work, calculations, drawing preparation, submission of backup data, test reports instruction books (and) , etc. shall be included.

- 1) As stated elsewhere in this bidding documents, the drawings included in the bidding documents except drawing mark "For Construction" are for bidding purposes only and shall not be used for execution of the work.
- 2) The submitted drawings which are incomplete/unacceptable, or are the bidding document copies with minor modifications shall be returned unmarked to the Contractor.
- 3) The drawings shall be furnished which provide all details required for thoroughly described equipment as well as installation methods and requirements. However, EGAT retains the right to request additional details if those furnished are perceived inadequate.
- 4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

ELECTRICAL PART

Schedule 2

Work included in this contract.

The work included in this contract to be performed by the contractor shall be as specified in the contract documents and as follows:

1. 500 kV (AIS)

- 1.1. Design, supply and installation of equipment required for a complete the sectionalized 500 kV Line.
- 1.2. Design, supply and installation of miscellaneous hardware required for as follows :
 - 1.2.1 The connection of 500 kV overhead line to the 70 MVar, 525 kV shunt reactor (SR3A & SR4B)
 - 1.2.2 The grounding equipment and miscellaneous hardware for 70 MVar, 525 kV shunt reactor (SR3A & SR4B)

2. Grounding system

- 2.1 Design, supply and installation the grounding system of the 500 kV Substation grounding system.
- 2.2 The grounding conductor for the substation grounding system shall be of the 4/0 AWG bare copper wire type.
- 2.3 Design, supply and installation of the grounding equipment and miscellaneous hardware for 500 kV system.

3. Lightning protection

- 3.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) is to be used in calculation instead of Critical Flashover voltage (CFO) as follows :
 - 1550 kV for 500 kV SubstationFor 22 kV Substation, the stroke current of 2 kA shall be used for the calculation.
- 3.2 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

4. Facility system

- 4.1 Outdoor facility system
 - 4.1.1 Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting, fence lighting, access road lighting, power box (PRB), sign board lighting, lighting relay panel, raceways, and wiring cables for lighting circuits.

- 4.1.2 The lamps for outdoor facility lighting system shall be LED type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation.
- 4.2 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated load current.
- 4.3 The voltage drop from the safety switch to the AC boards and from the AC boards to the load shall not exceed 3% and 2% respectively.

5. Others work

- 5.1 Modification of Junction box supporting structure (JB001) for the installation of outdoor receptacle box (ORB2).
- 5.2 Removal of the existing fence lighting with steel structures. Details of removal are shown on the bidding document drawings. All removed equipment shall be carefully packed by the Contractor and delivered to EGAT at Pluak Daeng Substation.

6. Testing and commissioning

- 6.1 Testing and commissioning of all equipment required to make the substation function properly.

Work not included in this Contract. The Work not included in this Contract shall be as shown on the drawings and as follows :

- 1. Supply and installation of the 525 kV Shunt Reactors and their Neutral Reactors, except cabling from the control cubicle of the Shunt Reactors to the associated equipment.

CONTROL AND PROTECTION PART

Schedule 2

1. Work Included In This Contract for 500kV PLUAK DANG SUBSTATION

- 1.1. Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
 - Breaker failure relay and add breaker equipment for each shunt reactor line no.1 & no.2 to PSK substation.
 - Loose equipment as specified in the Price Schedules
 - Cable and accessories as well as connection of cables among all the new equipment, the existing panels, primary equipment and the associated equipment in order to complete the function of the control and protection system.
- 1.2. Design, modification, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
 - Swing rack type protective relay switchboards
 - Transducer panel and Interposing relay panel
 - Marshalling panels for the remote terminal unit
 - Marshalling panels for the fault recording system
 - Marshalling panels for the control system
 - Fault Recording System
 - 400/230 VAC and 125 VDC Power distribution boards.
- 1.3. Design and modify existing drawings of control and protection system as a result of relocating transmission line to PSK substation.
- 1.4. Modify control system due to additional Control Switching Device (CSD).
- 1.5. Modify associated existing control and protection system of shunt reactor due to additional of breakers and breaker fail relays.
- 1.6. Design of the schematics and wiring diagrams of the additional and replacement inputs to the existing Computerized Control System (CCS), including test and commissioning of the completed CCS.
- 1.7. Design of the schematics and wiring diagrams of the additional and replacement inputs to the existing Fault Recording System (FRS), including modification, wiring, configuration, calibration, test and commissioning of the completed FRS.
- 1.8. Any modification and interfacing works to the existing primary equipment, metering, control and protection panels, including supply of related accessory equipment which is required for incorporating the new equipment. The modified existing drawings shall be performed by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.

- 1.9. The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 1.10. Removal of the unused existing cables. The removed cables shall be neatly reeled and kept in a suitable place recommended by EGAT.
- 1.11. Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

CIVIL AND ARCHITECTURAL PART

Schedule 2

Work included in this Contract.

CIVIL WORK

1. Design and construction of
 - 1.1 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
 - 1.1.1 Shunt reactor foundation with oil containing pit.
 - 1.1.2 Cable tray for transformer, underground cable in HDPE duct.
 - 1.1.3 Steel structure foundation.
 - 1.1.4 Equipment structure foundation with sub trench (if required)
 - 1.2 Road and drainage system.
 - 1.3 Drainage system for cable trench.
 - 1.4 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
 - 1.5 Oil separator (volume of oil 25/62/85cu.m.). The contractor shall make an Oil separator design calculation in accordance with “IEEE STD-979-1994 (R2004)” (IEEE Guide for Substation Fire Protection), “IEEE STD-980-1994 (R2001)” (IEEE Guide for containment and control of oil spills in substation) and “Wastewater Quality Standard” of Pollution Control Department, Ministry of Natural Resources and Environment.
 - 1.6 Cable trench with cover.
2. Construction of
 - 2.1 Steel structure foundation.
 - 2.2 Equipment structure foundation with sub trench (if required).
 - 2.3 Cable trench.
 - 2.4 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
 - 2.5 Crushed rock surfacing.
3. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
4. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
5. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.
6. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
7. EGAT’s Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.

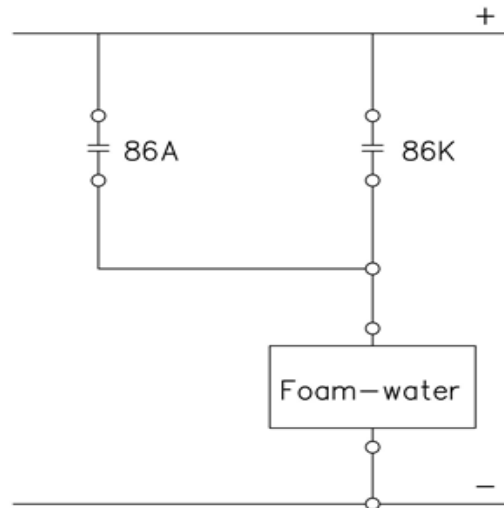
8. EGAT's Soil Investigation Report (attached to the Contract) is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
9. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
10. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
11. The Contract price shall be adjusted (added or reduced) in case that the soil investigation results to be used for the design works is different from the layout and standard drawings.
12. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval.(if pad type foundation is required).
13. The Contractor shall remove all debris from construction material and other works in order to make the site clean and be in the condition acceptable to EGAT.

WATER SUPPLY AND FIRE PROTECTION SYSTEM

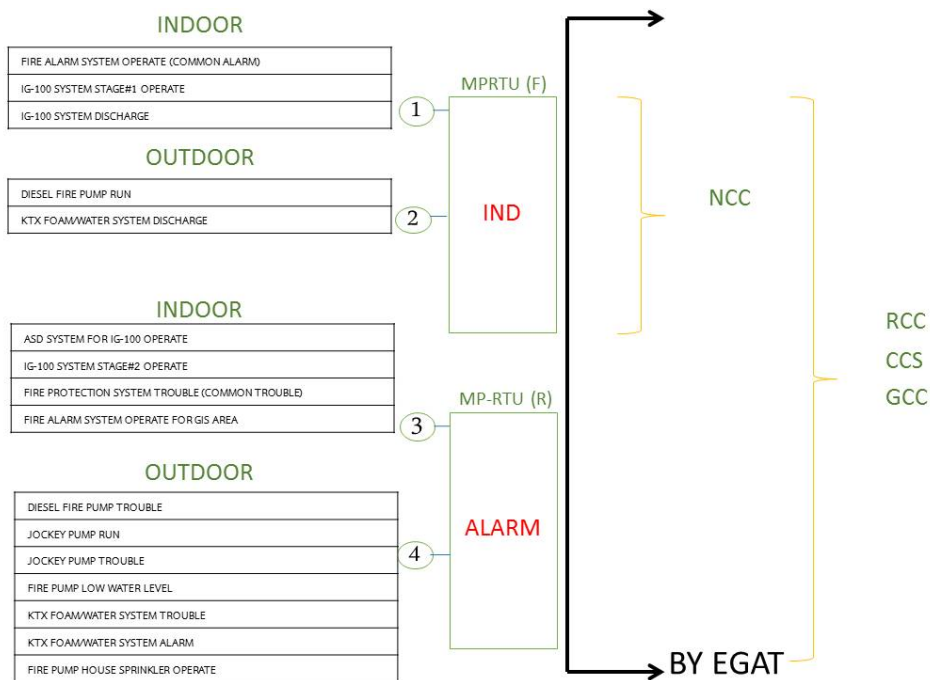
14. Design and construction of
 - 14.1 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.
 - 14.2 Fire protection system for the Transformer /Shunt Reactor : The Foam-water spray system shall comply with the following;
 - 14.2.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850
 - 14.2.2 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.
 - 14.2.3 Nozzles : NFPA 16 and as per Manufacturer's Recommendation
 - 14.2.4 Detection system : Air Expansion Linear Heat Detection System (LHB)
 - 14.2.5 Equipment for system : FM approved, UL Listings , Vds
 - 14.2.6 Foam-water spray system provided for Transformer/ Shunt Reactor shall be designed for a density of 10.2 litre/min-sq.m over the exposed surface at the Transformer/ Shunt Reactor.
 - 14.2.7 There shall be one linear heat detector box for each transformer / shunt reactor.
 - 14.2.8 There shall be one control panel for fire detection and foam/water spray system which controls all foam/water spray system of all protected transformers.
 - 14.3 Foam hose shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room in Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.
 - 14.4 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (transformers, shunt reactors) at the building where control room locates.

- 14.5 Fire protection system circuits for buildings and switchyards : notification appliance circuits , and signaling line circuits , shall be class A circuit. Initiating device circuits can be class B circuit.
- 14.6 For Control System Logic as shown on specification 3001-13.4 item 4.1 shall be changed to the new detail as following

(4.1) In case of fire, heat detector and the tubular expansion detector first give alarm. If rate of rise/fixed temp in heat detector/tubular expansion detector sense fire condition, there shall be alarm in control room and the detected transformer and/Shunt Reactor shall be tripped before applying Foam-Water spray as the condition shown in the diagram below ;



- 14.7 For fire protection system monitoring system, contractor shall be responsible for procuring and installing a system comprising of monitoring and automatic alarm equipment; and for connecting the system to EGAT SCADA using Protocol Modbus or other Protocols that EGAT supports via TCP/IP port RJ45. When detectors detect smoke or heat, or equipment abnormality occurs, or fire protection system operates, the monitoring system will send alarm signals and record the even location, event date, start time, end time, and other necessary information. The event log must be appropriate for analyzing the cause of the event. The signals shall be verifiable and sent through (CCS) RTU and EGAT SCADA to NCC (National Control Center). The equipment shall be installed in control building or other location specified by EGAT. Signals of indoor fire protection system of each room and signals of outdoor fire protection system of each transformer / shunt reactor shall be sent to local CCS, GCC, RCC, and NCC as following details;



- 14.8 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 14.9 Water supply system.
- 14.10 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 14.11 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings :
- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO₂) conforming to TIS 881 and/or dry chemical conforming to TIS 332 , capacity 10 lbs/set. The fitting accessories shall be provided.
 - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 14.12 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 14.13 Contractor shall warranty the fire protection system for one full year starting the date after contract final completion. Fire protection system shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation, at contractor's cost and expense.
- 14.14 Notwithstanding the expiration of any warranty period described in this contract, the warranty period for any fire protection system or equipment and maintenance period shall be extended by a period equal to the sum of any periods during the warranty period when such system or equipment cannot be used for the purposes for which they were intended or the delays in maintenance, starting from the date EGAT has given contractor notice.
- 14.15 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24" LED monitor which show the status of fire protection system in control room in 500/230/115 kV GIS and Control/Relay Building. One set of laser jet printer shall be provided.
- 14.16 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.

14.17 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.

14.18 Fire detection devices in substation shall be as table below.

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms, Thyristor valve room	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	<ul style="list-style-type: none"> ■ SD when environmental condition is acceptable. ■ LHD when environmental condition is out of range for SD ■ ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

Abbreviations

1. Heat detector, HD
2. Addressable Spot-Type Photoelectric Smoke detector, SD
3. Linear Heat Detector, LHD
4. Aspirated smoke detectors, ASD
5. Optical beam smoke detector, OBSD

14.19 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1

14.20 Underground water piping shall have indicator sign.

14.21 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).

14.22 All junction boxes or electrical equipment in rooms on ground floor shall be 1.2 m higher from room floor elevation.

14.23 All firestops for penetrations shall be pre-formed block firestop / pillow firestop / sleeve firestop / pathway firestop, being able to be removed and reinstalled conveniently. Foam and sealant firestops shall not be used.

15. Construction of

15.1 Foam house.

CONTROL AND PROTECTION PART

Schedule 3

1. Work Included In This Contract for 500kV WANG NOI SUBSTATION

- 1.1. Design and modify existing drawings of control and protection system as a result of relocating transmission line to PSK
- 1.2. Design and modify of the schematics and wiring diagrams as a result of relocating transmission line to PSK to the existing Computerized Control System (CCS), including test and commissioning of the completed CCS.
- 1.3. Design and modify of the schematics and wiring diagrams as a result of relocating transmission line to PSK to the existing Fault Recording System (FRS), including modification, wiring, configuration, calibration, test and commissioning of the completed FRS.
- 1.4. Any modification and interfacing works to the existing primary equipment, metering, control and protection panels, including supply of related accessory equipment which is required for incorporating the new equipment. The modified existing drawings shall be performed by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.
- 1.5. The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 1.6. Removal of the unused existing cables. The removed cables shall be neatly reeled and kept in a suitable place recommended by EGAT.
- 1.7. Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.