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 กิจการร่วมค้านั้นต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

(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 เพื่อให้เป็นไปตาม**พระราชบัญญัติคุ้มครองข้อมูลส่วนบุคคลของประเทศไทย 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

การขีดฆ่าข้อมูลส่วนบุคคลอ่อนไหว

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 ขอให้ท่านขีดฆ่า 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.

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Registration Form

Invitation to Bid No. RTS3-S-02

Supply and Construction of 115 kV Chaiyaphum Substation (GIS) and Improvement of 230 kV Chaiyaphum Substation

Transmission System Expansion and Renovation Project Phase 3

Available Duration for Purchasing : February 26, 2025 – March 26, 2025

Price of Bidding Documents : USD 270.- or THB 8,000.-

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 thana.kir@egat.co.th (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 :				

Contact Information of In-charge Officer	
Name	Mr. Thana Kirdboonsong
Email address	thana.kir@egat.co.th
Telephone No.	66 2436 3342
Mobile No.	668 71116 3690

Invitation to Bid No. RTS3-S-02

Supply and Construction of 115 kV Chaiyaphum Substation (GIS) and Improvement of 230 kV Chaiyaphum Substation Transmission System Expansion and Renovation Project Phase 3 Two-Envelope

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. The project is on the process of the Government's Approval. The Bid may be cancelled in case the project is not approved.

Place of Construction : Chaiyaphum Substation (GIS) and Chaiyaphum Substation

Medium Cost (including Value Added Tax and other expenses) : THB 822,000,000.-

Eligibility of Bidders

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.

Availability of Bidding Documents

Bidding Documents are available for online purchase during 8:00 hrs. to 15:00 hrs., Bangkok Standard Time, as from February 26, 2025 to March 26, 2025 at USD 270.- or THB 8,000.- per copy, non-refundable.

Please find more details for online purchasing process at http://www4.egat.co.th/fprocurement/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 shall be submitted at Bidding Room, 1st Floor, Tor 082 Building at EGAT's Head Office, Nonthaburi during 09:00 hrs. to 10:00 hrs., Bangkok Standard Time, April 30, 2025 and Technical Proposal will be opened publicly at 10:00 hrs.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

February 26, 2025

Kannika Dhachalupat

(Mrs. Kannika Dhachalupat)

Chief, International Procurement Department – Transmission Segment

ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

เรื่อง ประกวดราคาจ้าง เลขที่ RTS3-S-02

ประกวดราคา 2 ซอง

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 115 kV ชัยภูมิ (GIS) และจัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 230 kV ชัยภูมิ สำหรับโครงการปรับปรุงและขยายระบบส่งไฟฟ้าที่เสื่อมสภาพตามอายุการใช้งานระยะที่ 3 โดยทำสัญญาแบบปรับราคาได้ (ค่า k) โดยใช้งบประมาณ กฟผ. ทั้งนี้ โครงการอยู่ระหว่างการขออนุมัติจากคณะรัฐมนตรี การจัดหาครั้งนี้จะไม่ผูกพัน กฟผ. หากโครงการไม่ได้รับอนุมัติ

สถานที่ก่อสร้าง : สถานีไฟฟ้าแรงสูงชัยภูมิ (GIS) และสถานีไฟฟ้าแรงสูงชัยภูมิ

ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ) : 822,000,000.- บาท

คุณสมบัติของผู้เสนอราคา

1. ต้องเป็นนิติบุคคลผู้มีอาชีพรับจ้างตามประกวดราคาจ้างดังกล่าว และต้องไม่เป็นผู้ทิ้งงานซึ่งปลัดกระทรวงการคลังได้แจ้งเวียนชื่อไว้ หรือต้องไม่เป็นผู้ที่ กฟผ. ห้ามติดต่อหรือห้ามเข้าเสนอราคา หรือต้องไม่เป็นผู้ที่ได้รับผลของการสั่งให้นิติบุคคลหรือบุคคลอื่นเป็นผู้ทิ้งงานตามคำสั่ง กฟผ.
2. ต้องไม่เป็นผู้มีผลประโยชน์ร่วมกันกับผู้เสนอราคารายอื่น ณ วันประกาศประกวดราคาครั้งนี้เป็นต้นไป หรือต้องไม่เป็นผู้กระทำการอันเป็นการขัดขวางการแข่งขันราคาอย่างเป็นธรรมในการดำเนินการประกวดราคาครั้งนี้
3. ต้องไม่เป็นที่ปรึกษาของ กฟผ. หรือมีส่วนร่วมในบริษัทที่ปรึกษาของ กฟผ. ในงานนี้ หรือต้องไม่มีผู้ปฏิบัติงาน กฟผ. เข้าไปมีส่วนร่วมในกิจการของผู้เสนอราคา ไม่ว่าจะในฐานะผู้ถือหุ้นที่มีสิทธิควบคุมการจัดการ กรรมการ ผู้อำนวยการ ผู้จัดการ พนักงาน ลูกจ้าง ตัวแทน หรือที่ปรึกษา ยกเว้น ในกรณีที่ผู้ปฏิบัติงานได้รับคำสั่งอย่างเป็นทางการจาก กฟผ. ให้ไปปฏิบัติงานหรือเข้าร่วมในกิจการของผู้เสนอราคา
4. ต้องไม่เป็นผู้ได้รับเอกสิทธิ์หรือความคุ้มกัน ซึ่งอาจปฏิเสธไม่ยอมขึ้นศาลไทย เว้นแต่รัฐบาลของผู้เสนอราคาได้มีคำสั่งให้สละสิทธิ์และความคุ้มกันเช่นว่านั้น
5. ผู้ประสงค์เข้าประกวดราคาในนามของกิจการร่วมค้าหรือกิจการค้าร่วม (Joint Venture or Consortium) จะต้องดำเนินการทุกขั้นตอนของการประกวดราคาในนามของกิจการร่วมค้าหรือกิจการค้าร่วม ตั้งแต่การเสนอราคาจนสิ้นสุดข้อผูกพันกับ กฟผ.

การขายเอกสารประกวดราคา

ผู้สนใจติดต่อซื้อเอกสารประกวดราคา ในราคาชุดละ 8,000.- บาท ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 26 กุมภาพันธ์ 2568 ถึงวันที่ 26 มีนาคม 2568 ทั้งนี้ สามารถดูรายละเอียดการซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ http://www4.egat.co.th/fprocurement/biddingeng หรือสอบถามข้อมูลเพิ่มเติมได้ทางโทรศัพท์ หมายเลข 0 2436 0342 หรืออีเมล procurement.tse@egat.co.th

การยื่นซองประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา ในวันที่ 30 เมษายน 2568 เวลา 09:00 น. ถึง 10:00 น. และเปิดซองข้อเสนอด้านเทคนิคเวลา 10:00 น. ณ ห้องประกวดราคา ชั้น 1 อาคารฝ่ายจัดซื้อจัดจ้างและบริหารพัสดุ ท.082 การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย เชิงสะพานพระราม 7 จังหวัดนนทบุรี

ประกาศ ณ วันที่ 26 กุมภาพันธ์ 2568

กรรณิกา ธชาลุภัฏ

(นางกรรณิกา ธชาลุภัฏ)

หัวหน้ากองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง

ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)

ในการจัดซื้อจัดจ้างที่มิใช่งานก่อสร้าง

1. **ชื่อโครงการ** Bid No. RTS3-S-02

   การจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 115 kV ชัยภูมิ (GIS) และจัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 230 kV ชัยภูมิ

   โครงการปรับปรุงและขยายระบบส่งไฟฟ้าที่เสื่อมสภาพตามอายุการใช้งานระยะที่ 3

   /หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

2. **วงเงินงบประมาณที่ได้รับจัดสรร**

   โครงการปรับปรุงและขยายระบบส่งไฟฟ้าที่เสื่อมสภาพตามอายุการใช้งานระยะที่ 3

   งบประมาณ 23,380 ล้านบาท

3. **วันที่กำหนดราคากลาง** 16 ธันวาคม 2567 (วันที่ รวร. อนุมัติ)

   ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 822,000,000.00 บาท **ราคา/หน่วย** ตามเอกสารแนบ

4. **แหล่งที่มาของราคากลาง**

   หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานระบบส่ง

5. **รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง**

5.1 นายณัฏฐ์	วงศ์เทพวาณิช	หมฟ-ร. กวอ-ร.
5.2 นายภูภัทร	พานทอง	หสก-ร. กวอ-ร.
5.3 นายภานุวัฒน์	ลิขิตผลผดุง	หอต-ร. กวอ-ร.
5.4 นางสาวจารุวรรณ	พิพัฒน์มงคลพร	หวอ-ร. กวอ-ร.
5.5 นายรุหาญ	รุจิธัญธาร	กวป-ร.
5.6 นายมณเฑียร	จ ปาอ่อน	กวธ-ร.
5.7 นายสมประสงค์	พัฒนคุณเจริญกิจ	กวส-ส. อรส.

<u>หมายเหตุ</u> ค่าใช้จ่ายอื่นๆ ได้แก่ ค่าใช้จ่ายที่ กฟผ. ต้องจ่ายตามวิธีการพิจารณาเปรียบเทียบราคาที่กำหนดไว้ในเอกสารประกวดราคา เช่น อากรขาเข้า เป็นต้น

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MEDIUM COST FOR BID NO. RTS3-S-02

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS) AND IMPROVEMENT OF 230 KV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Schedule	Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
			Amount	Amount	Amount	Amount	Amount
1	115 KV CHAIYAPHUM SUBSTATION (GIS)	THB	374,220,307.80				
				171,764,263.10	142,650,517.55	217,592.49	71,464,001.56
2	230 KV CHAIYAPHUM SUBSTATION	THB					
							61,600.00
BID PRICE		THB	374,220,307.80	Baht 171,764,263.10	Baht 142,650,517.55	Baht 217,592.49	Baht 71,525,601.56
OTHER EXPENSES		THB	7,484,406.16	Baht	Baht	Baht	Baht
VAT		THB	26,719,329.98	Baht 12,023,498.42	Baht 9,985,536.23	Baht 15,231.47	Baht 5,006,792.11
SUMMARY OF BID PRICE		THB	408,424,043.94	Baht 183,787,761.52	Baht 152,636,053.78	Baht 232,823.96	Baht 76,532,393.67
TOTAL MEDIUM COST		THB	821,613,076.87				
TOTAL MEDIUM COST (ROUNDED)		THB	822,000,000.00				

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MEDIUM COST FOR BID NO. RTS3-S-02
SCHEDULE 1 : 115 KV CHAIYAPHUM SUBSTATION (GIS)
SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)
TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount	Amount	Amount
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	371,438,902.80	158,913,154.70			71,464,001.56
PART 1C : CIVIL WORK				142,650,517.55		
PART 1D : SUPPLY OF SPARE PARTS	THB	2,781,405.00	8,795,452.40		196,483.49	
PART 1E : WORK ON SUPPLY EQUIPMENT BASIS			4,055,656.00		21,109.00	
TOTAL PRICE	**THB**	**374,220,307.80**	**Baht 171,764,263.10**	**Baht 142,650,517.55**	**Baht 217,592.49**	**Baht 71,464,001.56**

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB2 : Distribution Transformer			2,312,000.00	277,440.00
Schedule 1AB4 : Surge Arrester	THB	2,457,000.00	837,000.00	395,280.00
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	249,000.00	30,000.00	33,480.00
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	364,989,384.00		43,798,726.08

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB11 : Power Fuse, Fuse Link and Hook Stick	THB	1,165,975.80		139,917.10
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			3,953,669.50	474,440.34
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	1,529,609.40	1,774,102.00	396,445.37
Schedule 1AB14 : Substation Steel Structure			3,472,876.00	1,041,862.80

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB15 : Insulator				123,717.33
Schedule 1AB16 : Cable Terminations	THB	231,261.00		69,378.30
Schedule 1AB17 : XLPE Power Cable			318,530.00	95,559.00
Schedule 1AB18 : Low Voltage Cable and Conductor			12,510,239.50	3,753,071.85

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB19 : Switchyard Lighting Fixtures			2,010,274.20	603,082.26
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			123,415.60	37,024.68
Schedule 1AB21 : Bus Fitting	THB	206,951.80		62,085.54
Schedule 1AB22 : Grounding Material	THB	352,767.80	536,174.10	266,682.57

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB23 : Substation Miscellaneous	THB	256,953.00	60,354.80	95,192.34
Schedule 1AB24 : Control and Protection System			122,267,491.00	15,440,128.00
Schedule 1AB25 : Fault Recording System			3,032,950.00	328,418.00
Schedule 1AB33 : CCTV			2,568,208.00	290,140.00

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel			2,334,100.00	126,200.00
Schedule 1AB35 : Communication Cable			771,770.00	1,256,500.00
Schedule 1AB39 : Commissioning				1,416,000.00

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 1AB40 : Installation of Equipment and Steel Structure Supplied by EGAT				943,230.00
PART 1AB	**THB**	**371,438,902.80**	**Baht** **158,913,154.70**	**Baht** **71,464,001.56**

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MEDIUM COST FOR BID NO. RTS3-S-02

PART 1C : CIVIL WORK

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	**Local Currency** (excluding VAT) Baht
	Amount
Schedule 1C1 : Foundation Work	5,446,239.00
Schedule 1C2 : Cable Trench	2,958,751.70
Schedule 1C3 : Building	81,753,441.38
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	2,254,890.00
Schedule 1C5 : Water Supply System	725,611.00
Schedule 1C6 : Drainage System	4,029,332.00
Schedule 1C7 : Special Construction Works	7,311,125.39
Schedule 1C8 : Miscellaneous	9,549,232.00
Schedule 1C9 : Fire Protection System	28,621,895.08
PART 1C	**Baht** **142,650,517.55**

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MEDIUM COST FOR BID NO. RTS3-S-02

PART 1D : SUPPLY OF SPARE PARTS

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	Currency	Supply of Equipment		Local Transportation
		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	2,129,525.20		106,476.26
Schedule 1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	133,162.70		7,989.76
Schedule 1D12 : Spare Parts for AC&DC Distribution Board and Termination Box			115,757.40	6,945.44
Schedule 1D22 : Spare Parts for Grounding Material	THB	518,717.10		31,123.03

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MEDIUM COST FOR BID NO. RTS3-S-02

PART 1D : SUPPLY OF SPARE PARTS

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	Currency	**Supply of Equipment**		**Local Transportation**
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount
Schedule 1D24 : Spare Parts for Control and Protection System			7,813,216.00	32,551.00
Schedule 1D25 : Spare Parts for Fault Recording System			866,479.00	11,398.00
PART 1D	**THB**	**2,781,405.00**	**Baht 8,795,452.40**	**Baht 196,483.49**

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MEDIUM COST FOR BID NO. RTS3-S-02

PART 1E : WORK ON SUPPLY EQUIPMENT BASIS

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	Currency	**Supply of Equipment**		**Local Transportation**
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount
Schedule 1E24 : Control and Protection System			4,055,656.00	21,109.00
PART 1E			**Baht 4,055,656.00**	**Baht 21,109.00**

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MEDIUM COST FOR BID NO. RTS3-S-02
SCHEDULE 2 : 230 KV CHAIYAPHUM SUBSTATION
IMPROVEMENT OF 115 KV CHAIYAPHUM SUBSTATION
TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Description	Currency	**Supply of Equipment**		**Local Currency**	**Local Transportation**	**Local Transportation, Construction and Installation**
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount	Amount	Amount
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT						61,600.00
TOTAL PRICE			**Baht**	**Baht**	**Baht**	**Baht** **61,600.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

IMPROVEMENT OF 115 KV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Amount
Schedule 2AB24 : Control and Protection System				61,600.00
PART 2AB			**Baht**	**Baht** **61,600.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB2 : Distribution Transformer

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB2-1	500 kVA, 22000-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX2702	2					1,156,000.00	2,312,000.00	XXXXX	XXXXX
1AB2-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB2-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	277,440.00	277,440.00
Total Price for Schedule 1AB2							**Baht**	**2,312,000.00**	**Baht**	**277,440.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB4 : Surge Arrester

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB4-1	108 kV Surge Arrester as per Ratings and Features RF SA7Y01	27		THB	91,000.00	2,457,000.00			XXXXX	XXXXX
1AB4-2	Steel Supporting Structure for SA7Y01 (for Item No. 1AB4-1), H=4.50 m as per Dwg. No. ST-LA-7-01 and SD-AB-0-01	27					31,000.00	837,000.00	XXXXX	XXXXX
1AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB4-1 thru 1AB4-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	395,280.00	395,280.00
Total Price for Schedule 1AB4				**THB**		**2,457,000.00**	**Baht**	**837,000.00**	**Baht**	**395,280.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB6-1	22 kV VT, 150 kV BIL, 22000/√3-110/√3&110/√3 V oil filled as per Ratings and Features RF VT2002	3		THB	83,000.00	249,000.00			XXXXX	XXXXX
1AB6-2	Junction Box type PT6 (for Item No. 1AB6-1) as per Dwg. No. TP-E-18.1-2/4, 3/4 and TP-E-18.4	1					30,000.00	30,000.00	XXXXX	XXXXX
1AB6-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB6-1 thru 1AB6-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	33,480.00	33,480.00
Total Price for Schedule 1AB6				**THB**		**249,000.00**	**Baht**	**30,000.00**	**Baht**	**33,480.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB7-1	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (KT4A & Line no.1 to PEA)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX
1AB7-2	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Line no.2 to PEA & KT2A)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX
1AB7-3	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Line no.4 to PEA & BESS)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX
1AB7-4	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Line no.1 to Bamnet Narong & KT5A)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX
1AB7-5	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Phon & Line no.2 to Bamnet Narong)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX

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1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB7-6	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Line no.3 to PEA & 115kV Capacitor Bank No.1)	1		THB	60,831,564.00	60,831,564.00			XXXXX	XXXXX
1AB7-7	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) and Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-8	123 kV 2000 A 40 kA Gas Insulated Switchgear as per Ratings and Features RF IS7541(IEC) outdoor type (GIB) as per Drawing No. CYP-S-1-02/05, CYP-S-1-03/05 and CYP-S-2-01/01	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-9	Local control cubicle for IS7541 for item 1AB7-1 thru 1AB7-8*	18		THB	included	included			XXXXX	XXXXX
1AB7-10	Steel Supporting Structure for IS7541*	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-11	Removable service platform and removable ladder for GIS inspection	1	lot	THB	included	included			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB7-12	Cost of Local Transportation, Construction and Installation for Item No. 1AB7-1 thru 1AB7-11	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	43,798,726.08	43,798,726.08
	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**	**364,989,384.00**		**Baht**		**Baht**	**43,798,726.08**

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

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB11 : Power Fuse, Fuse Link and Hook Stick

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
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)	6		THB	178,048.20	1,068,289.20			XXXXX	XXXXX
1AB11-2	Fuse link or refill unit 20E for 22 kV power fuse (Standard Speed)	6		THB	16,281.10	97,686.60			XXXXX	XXXXX
1AB11-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB11-1 thru 1AB11-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	139,917.10	139,917.10
Total Price for Schedule 1AB11				**THB**		**1,165,975.80**	**Baht**		**Baht**	**139,917.10**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB12 : AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB12-1	400/230 Vac Load Center Unit Substation (LCUS) as per Dwg. No. SE-LCUS-0-01	1					1,023,650.10	1,023,650.10	XXXXX	XXXXX
1AB12-2	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.	2					242,652.30	485,304.60	XXXXX	XXXXX
1AB12-3	Termination Box type TB1 as per Dwg No. LT-TB-0-01	12					4,072.20	48,866.40	XXXXX	XXXXX
1AB12-4	Outdoor Receptacle Box type ORB3 as per Dwg. No. SE-ORB-0-01	1					45,856.80	45,856.80	XXXXX	XXXXX
1AB12-5	22kV 100A 12.5kA Load break switch with Cable Termination as per Ratings and Features RF LB2110	2					572,382.80	1,144,765.60	XXXXX	XXXXX
1AB12-6	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	1					234,080.00	234,080.00	XXXXX	XXXXX
1AB12-7	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Room, designed by Contractor)	2					234,080.00	468,160.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB12 : AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB12-8	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	1					196,233.40	196,233.40	XXXXX	XXXXX
1AB12-9	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	1					153,376.30	153,376.30	XXXXX	XXXXX
1AB12-10	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Room, designed by Contractor)	1					153,376.30	153,376.30	XXXXX	XXXXX
1AB12-11	Cost of Local Transportation, Construction and Installation for Item No. 1AB12-1 thru 1AB12-10	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	474,440.34	474,440.34
Total Price for Schedule 1AB12							**Baht**	**3,953,669.50**	**Baht**	**474,440.34**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB13 : Stationary Battery and Battery Charger

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (Designed by Contractor)									
1AB13-1a	a) Battery	1	set	THB	1,439,549.10	1,439,549.10			XXXXX	XXXXX
1AB13-1b	b) Electrolyte	1	set	THB	29,778.10	29,778.10			XXXXX	XXXXX
1AB13-1c	c) Battery Rack	1	set	THB	60,282.20	60,282.20			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, and shall be suitable for use with substation battery Item No. 1AB13-1 (Designed by Contractor)	2					887,051.00	1,774,102.00	XXXXX	XXXXX
1AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB13-1 thru 1AB13-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	396,445.37	396,445.37
Total Price for Schedule 1AB13				**THB**		**1,529,609.40**	**Baht**	**1,774,102.00**	**Baht**	**396,445.37**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB14 : Substation Steel Structure

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB14-1	115 kV take-off structure (TS701) as per Dwg. No. ST-TS-7-01	10					142,937.00	1,429,370.00	XXXXX	XXXXX
1AB14-2	115 kV take-off structure (TS702) as per Dwg. No. ST-TS-7-02	6					189,761.00	1,138,566.00	XXXXX	XXXXX
1AB14-3	115 kV beam (BB701) as per Dwg. No. ST-BB-7-01	8					56,682.00	453,456.00	XXXXX	XXXXX
1AB14-4	115 kV beam (BB703) as per Dwg. No. ST-BB-7-03	4					66,047.00	264,188.00	XXXXX	XXXXX
1AB14-5	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	2					10,843.00	21,686.00	XXXXX	XXXXX
1AB14-6	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	1					8,379.00	8,379.00	XXXXX	XXXXX
1AB14-7	22 kV bus support structure (BS203) as per Dwg. No. ST-BS-2-03	1					83,298.00	83,298.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB14 : Substation Steel Structure

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB14-8	6.0 m self support telecommunication tower on the roof of control building as per Dwg. No. ST-TT-0-05 and ST-TT-0-05 F	1					73,933.00	73,933.00	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	1,041,862.80	1,041,862.80
Total Price for Schedule 1AB14							**Baht**	**3,472,876.00**	**Baht**	**1,041,862.80**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB15 : Insulator

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB15-1	115 kV station post insulator ANSI TR. No. 286 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB15-2	22 kV station post insulator ANSI TR. No. 208 as per Specification attached	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB15-3	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	XXXXX	XXXXX
1AB15-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB15-1 thru 1AB15-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	123,717.33	123,717.33
Total Price for Schedule 1AB15							**Baht**		**Baht**	**123,717.33**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB16 : Cable Terminations

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB16-1	22 kV cable terminations for 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF TN212H complete with termination accessories	6		THB	6,745.00	40,470.00			XXXXX	XXXXX
1AB16-2	Cable Cleats with necessary miscellaneous hardware for Item No. 1AB17-1 TREFOIL formation 3-phase set as per Ratings and Features RF TNAC1 (design by contractor)	Lump sum	Lump sum	THB	190,791.00	190,791.00			XXXXX	XXXXX
1AB16-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB16-1 thru 1AB16-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	69,378.30	69,378.30
Total Price for Schedule 1AB16				**THB**		**231,261.00**	**Baht**		**Baht**	**69,378.30**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB17 : XLPE Power Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB17-1	22 kV 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF PC2110	Lump sum	Lump sum				318,530.00	318,530.00	XXXXX	XXXXX
1AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB17-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	95,559.00	95,559.00
Total Price for Schedule 1AB17							**Baht**	**318,530.00**	**Baht**	**95,559.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB18 : Low Voltage Cable and Conductor

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TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				4,491,366.00	4,491,366.00	XXXXX	XXXXX
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				3,189,450.00	3,189,450.00	XXXXX	XXXXX
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				63,360.00	63,360.00	XXXXX	XXXXX
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				720,500.00	720,500.00	XXXXX	XXXXX
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				3,523,327.50	3,523,327.50	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB18 : Low Voltage Cable and Conductor

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				509,916.00	509,916.00	XXXXX	XXXXX
1AB18-7	Overhead ground wire as per Specification attached	Lump sum	Lump sum				12,320.00	12,320.00	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	3,753,071.85	3,753,071.85
Total Price for Schedule 1AB18							**Baht**	**12,510,239.50**	**Baht**	**3,753,071.85**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB19 : Switchyard Lighting Fixtures

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	24					16,669.40	400,065.60	XXXXX	XXXXX
1AB19-2	Street lighting fixture, LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	39					16,335.00	637,065.00	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	39					24,952.40	973,143.60	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	603,082.26	603,082.26
Total Price for Schedule 1AB19							**Baht**	**2,010,274.20**	**Baht**	**603,082.26**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Aluminum tube as per Specification attached	Lump sum	Lump sum				11,792.00	11,792.00	XXXXX	XXXXX
1AB20-2	115 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				105,352.50	105,352.50	XXXXX	XXXXX
1AB20-3	115 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				6,271.10	6,271.10	XXXXX	XXXXX
1AB20-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB20-1 thru 1AB20-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	37,024.68	37,024.68
Total Price for Schedule 1AB20							**Baht**	**123,415.60**	**Baht**	**37,024.68**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB21 : Bus Fitting

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB21-1	115 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	206,951.80	206,951.80			XXXXX	XXXXX
1AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	62,085.54	62,085.54
Total Price for Schedule 1AB21				**THB**		**206,951.80**	**Baht**		**Baht**	**62,085.54**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB22 : Grounding Material

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	19,607.50	19,607.50			XXXXX	XXXXX
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				536,174.10	536,174.10	XXXXX	XXXXX
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	333,160.30	333,160.30			XXXXX	XXXXX
1AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB22-1 thru 1AB22-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	266,682.57	266,682.57
Total Price for Schedule 1AB22				**THB**		**352,767.80**	**Baht**	**536,174.10**	**Baht**	**266,682.57**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				50,256.80	50,256.80	XXXXX	XXXXX
1AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	31,183.90	31,183.90			XXXXX	XXXXX
1AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum				10,098.00	10,098.00	XXXXX	XXXXX
1AB23-4	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum	THB	150,000.00	150,000.00			XXXXX	XXXXX
1AB23-5	Heat shrinkable insulation material	Lump sum	Lump sum	THB	75,769.10	75,769.10			XXXXX	XXXXX
1AB23-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB23-1 thru 1AB23-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	95,192.34	95,192.34
Total Price for Schedule 1AB23				**THB**		**256,953.00**	**Baht**	**60,354.80**	**Baht**	**95,192.34**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB24-1	DSS : Digital Substation System including System Integrator	-See Bill of Materials for Item No. 1AB24-1 -See Scope of Work -Specification No. 1008 -Drawing Nos. CYP-E-1.2 SH.1-3, and TP-E-20.3	1	SET				122,267,491.00	122,267,491.00	XXXXX	XXXXX
1AB24-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB24-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	15,440,128.00	15,440,128.00
Total Price for Schedule 1AB24								**Baht**	**122,267,491.00**	**Baht**	**15,440,128.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB25-1	DSS : Fault Recording System	-See Bill of Materials for Item No. 1AB25-1 -See Scope of Work -Specification Nos. 1003, and 1008 -Drawing No. CYP-E-1.2 SH.1-3	1	SET				3,032,950.00	3,032,950.00	XXXXX	XXXXX
1AB25-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB25-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	328,418.00	328,418.00
Total Price for Schedule 1AB25								**Baht**	**3,032,950.00**	**Baht**	**328,418.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB33-1	CCTV System and accessories including:	1	SET				2,568,208.00	2,568,208.00	XXXXX	XXXXX
	(1) Outdoor PTZ Dome Camera (1 EA) (2) Indoor Fixed Camera (10 EA) (3) Outdoor Fixed Camera (13 EA) (4) PC Workstation (1 EA) (5) Server (1 EA) (6) Software license (6.1) Software management license (1 License) (6.2) Redording license (24 Licenses) (6.3) Video analytic license (24 Licenses) (7) Ethernet I/O Module (1 EA) (8) Monitor (4 EA) (9) HDMI Optical Extender (2 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 (23 EA) (15) Adapter for PTZ camera (1 EA)									

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
	(16) CCTV Pole 2 meter (Lumpsum) (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) (30 EA) (22) Surge protection-220VAC (10 SET) (23) Line Filter (10 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. RTS3-S-02

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB33-2	Cost of Local Transportation, Construction and Installation for	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	290,140.00	290,140.00
	IMPORTANT : 1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration. 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									
Total Price for Schedule 1AB33							**Baht**	**2,568,208.00**	**Baht**	**290,140.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB34-1	Vented Type Lead-Acid Station Battery 48Vdc. with capacity not less than 800 Ah (Tubular plate) at 10 Hour rated, 24 Cells,Nominal Voltage 2Volts/Cell, with Rack 1	2	SET				452,900.00	905,800.00	XXXXX	XXXXX
1AB34-2	Conventional Type Charger 48VDC, 200A. (230/115 kV CONTROL BUILDING at CYP)	3	SET				389,700.00	1,169,100.00	XXXXX	XXXXX
1AB34-3	48VDC. Load center Type1: 60 Breaker (230/115 kV CONTROL BUILDING at CYP)	2	SET				129,600.00	259,200.00	XXXXX	XXXXX
1AB34-4	Local Transportation, Construction and Installation for item 1AB34-1, 1AB34-2 and 1AB34-3	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	126,200.00	126,200.00
Total Price for Schedule 1AB34							**Baht**	**2,334,100.00**	**Baht**	**126,200.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB35-1	**Optical fiber cable from joint box at 230 kV Chaiyaphum2 take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-1.1	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) Rack cabinet and accessories (1 set) (e) Fiber frame termination cabinet with cable tray (1 set) (f) 36 pigtails (1.5 meter) (1 set) (g) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (h) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at CYP2 take-off structure (1 set)	1	LOT				168,170.00	168,170.00	XXXXX	XXXXX
1AB35-1.2	Local transportation, Construction and Installation for item 1AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	224,000.00	224,000.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB35-2	**Optical fiber cable from joint box at 230 kV Khon Kaen 3 take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-2.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 400 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 (1 set) (e) 36 pigtails (1.5 meter) (1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at KK3 take-off structure (1 set)	1	LOT				139,920.00	139,920.00	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		XXXXX	XXXXX	XXXXX	XXXXX	226,500.00	226,500.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB35-3	**Optical fiber cable from joint box at 230 kV Nong Bua Rawe take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-3.1	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 (1 set) (e) 36 pigtails (1.5 meter) (1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at NBR take-off structure (1 set)	1	LOT				103,920.00	103,920.00	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	189,000.00	189,000.00

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12/17/2024

MEDIUM COST FOR BID NO. RTS3-S-02

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB35-4	**Optical fiber cable from joint box at 230 kV Nakhon Ratchasima 2 take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-4.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 400 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 (1 set) (e) 36 pigtails (1.5 meter) (1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at NR2 take-off structure (1 set)	1	LOT				139,920.00	139,920.00	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		XXXXX	XXXXX	XXXXX	XXXXX	226,500.00	226,500.00

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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			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB35-5	**Optical fiber cable from joint box at 115 kV Bamnet Narong take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-5.1	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 (1 set) (e) 36 pigtails (1.5 meter) (1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at BNN take-off structure (1 set)	1	LOT				103,920.00	103,920.00	XXXXX	XXXXX
1AB35-5.2	Local transportation, Construction and Installation for item 1AB35-5.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	189,000.00	189,000.00

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1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB35-6	**Optical fiber cable from joint box at 115 kV Phon take-off structure to fiber frame termination cabinet at 230/115 kV Control building at Chaiyaphum substation**									
1AB35-6.1	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) Fiber frame termination cabinet with cable tray (1 set) (e) 36 pigtails (1.5 meter) (1 set) (f) 6-wire cleat for coiling optical fiber cable at take-off structure (4 sets) (g) 2-way joint box with accessories for OPGW cable and 36 core non-metallic optical fiber cable at PO take-off structure (1 set)	1	LOT				115,920.00	115,920.00	XXXXX	XXXXX
1AB35-6.2	Local transportation, Construction and Installation for item 1AB35-6.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	201,500.00	201,500.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
	IMPORTANT: 1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification: Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22). 2. The Bidder is required to later break down the unit price for sub-items of this Schedule for consideration.									
Total Price for Schedule 1AB35							**Baht**	**771,770.00**	**Baht**	**1,256,500.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB39 : Commissioning

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB39-1	Commissioning	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,416,000.00	1,416,000.00
Total Price for Schedule 1AB39							**Baht**		**Baht**	**1,416,000.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1AB40 : Installation of Equipment and Steel Structure Supplied by EGAT

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
1AB40-1	Dismantlement	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	943,230.00	943,230.00
Total Price for Schedule 1AB40							**Baht**		**Baht**	**943,230.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-1	115 kV Take off Structure Foundation (TS701) Pile Type	FD-TS-7-05 01/01	10	set	46,899.00	468,990.00
1C1-2	115 kV Take off Structure Foundation (TS702) Pile Type	FD-TS-7-07 01/01	6	set	44,701.00	268,206.00
1C1-3	115 kV Disconnecting Switch Support foundation (DS704) Pile Type	FD-DS-7-08 01/01	1	set	29,192.00	29,192.00
1C1-4	115 kV Circuit breaker foundation (CB701) Pile Type	FD-CB-7-41 01/01	1	set	43,786.00	43,786.00
1C1-5	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (CT702 only)	FD-GE-0-02 01/01	3	set	6,345.00	19,035.00
1C1-6	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02 01/01	1	set	2,467.00	2,467.00

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1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-7	115/230 kV General equipment support structure foundation (BP701,BP801, CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Short Pile Type (LA701 only)	FD-GE-0-02 01/01	39	set	6,345.00	247,455.00
1C1-8	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type	FD-LP-0-05 01/01	23	set	9,632.00	221,536.00
1C1-9	115 kV. GIB Air bushing support structure foundation (GBS701)	Design by Contractor, Dwg No.PES/SD-FD-GIB-8-01, SD-PL-0-01, SD-PL-0-02, See scope of work	13	set	11,362.00	147,706.00
1C1-10	115 kV. GIB support structure foundation (GIB701)	Design by Contractor, Dwg No.PES/SD-FD-GIB-8-02, SD-PL-0-01, SD-PL-0-02, See scope of work	Lump Sum	Lump Sum	386,216.00	386,216.00
1C1-11	22&33 kV Distribution Transformer foundation (DX402) Pad Type	FD-DX-4-01 01/01	1	set	10,556.00	10,556.00
1C1-12	Outdoor Load Break Switch foundation. (LBS)	Design by Contractor, Dwg No. KN-LBS-0-01, See scope of work	2	set	26,606.00	53,212.00

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1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C1-13	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-01 01/01	2	set	5,167.00	10,334.00
1C1-14	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05 01/01	1	set	6,346.00	6,346.00
1C1-15	RC. Slab for Skid Base 115 kV ,39.6 MVAR (SK719-S,SK719-L) Pile Type (SK719-S only)	Design by Contractor, Dwg No.FD-SK-7-16 01/01, SD-PL-0-01, SD-PL-0-02, See scope of work	1	set	93,379.00	93,379.00
1C1-16	22 kV Bus support structure foundation (BS201,BS202,BS203,BS204) Pad Type (BS203 only)	FD-BS-2-01 01/01	1	set	20,791.00	20,791.00
1C1-17	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01 - 01/01	Lump Sum	Lump Sum	3,393,557.00	3,393,557.00
1C1-18	Metering structure foundation (MS3) Pad type (Existing to be removed)	TP-339	1	set	2,314.00	2,314.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C1-19	22&33 kV Circuit breaker foundation (22kVCB) Pad type (Existing to be removed)	TP-345	1	set	850.00	850.00
1C1-20	22 kV Bus pole support structure foundation (BP 201, BP202, BP203) Pile Type (Existing to be removed)	FD-BP-2-02	2	set	267.00	534.00

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1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-21	22 kV 3150 Kvar Shunt Capacitor-Bank foundation (SC201) Pile Type (Existing to be removed)	FD-SC-2-02	1	set	416.00	416.00
1C1-22	Disconnecting switch operating platform foundation (OP001) (Existing to be removed)	FD-OP-0-01	1	set	15.00	15.00
1C1-23	115 kV Coupling Voltage Transformer Foundation (VT703) Pile Type (Existing to be removed)	FD-VT-7-06	9	set	398.00	3,582.00
1C1-24	Transformer Foundation (T-125) Pad Type (Existing to be removed)	TP-326	1	set	7,937.00	7,937.00
1C1-25	115 kV Take off Structure Foundation (TS701) Pile Type (Existing to be removed)	FD-TS-7-02	1	set	7,827.00	7,827.00
Total Price for Schedule 1C1					**Baht**	**5,446,239.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C2 : Cable Trench

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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	Lump Sum	2,068,956.70	2,068,956.70
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 01/02-02/02	Lump Sum	Lump Sum	355,892.00	355,892.00
1C2-3	Cable trench type "A" including steel cover for XLPE system (22kV)	Design by Contractor, VRK-CE0-02 01/02-02/02 R.0, See scope of work	Lump Sum	Lump Sum	280,052.50	280,052.50
1C2-4	Cable trench type "B" including steel cover for XLPE system (22kV)	Design by Contractor, VRK-CE0-02 01/02-02/02 R.0, See scope of work	Lump Sum	Lump Sum	216,858.00	216,858.00
1C2-5	Standard cable trench, steel cover included (Type"A") (Existing to be removed)	SD-CE-0-02 01/02-02/02	Lump Sum	Lump Sum	36,992.50	36,992.50
Total Price for Schedule 1C2					**Baht**	**2,958,751.70**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C3 : Building

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C3-1	115kV GIS Building	Designed by Contractor, Dwg No. SD-GIS-7-02A 01/09-09/09, SD-PL-0-01, SD-PL-0-02, CYP-C-1 01/01, See scope of work	Lump Sum	Lump Sum	45,985,533.00	45,985,533.00
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

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1C3 : Building

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C3-2	230/115kV Control Building	Dwg No. SD-CD-0-02A 01/32-32/32, SD-CD-0-02C 01/14-14/14, SD-CD-0-02FP 01/01, SD-CD-0-02L 01/10-10/10, SD-CD-0-02M 01/05-05, SD-CD-0-02ME 01/02-02/02, SD-CD-0-02SN 01/05-05, SD-PL-0-01, SD-PL-0-02, CYP-C-1 01/01	Lump Sum	Lump Sum	32,246,064.00	32,246,064.00

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1C3 : Building

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1	Air conditioning system and Ventilation system					
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)	-	14	set	56,915.89	796,822.46
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	68,539.00	137,078.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1C3 : Building

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1.5	Extra work for air conditioning system	-	Lump Sum	Lump Sum	included in 1C3-2	included in 1C3-2
1C3-2.1.6	Ventilation system	-	Lump Sum	Lump Sum	included in 1C3-2	included in 1C3-2
1C3-2.2	Solar rooftop system	-	Lump Sum	Lump Sum	2,520,000.00	2,520,000.00
Total Price for Schedule 1C3					**Baht**	**81,753,441.38**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C4 : Earth Work, Road and Crushed Rock Surfacing

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C4-1	RC.Road type " E " section 4 - 4	SD-RD-0-01 01/02-02/02	Lump Sum	Lump Sum	1,864,340.00	1,864,340.00
1C4-2	RC.Road type " E " section 4 - 4 (Existing to be removed)	SD-RD-0-01 01/02-02/02	Lump Sum	Lump Sum	5,550.00	5,550.00
1C4-3	Crushed rock surfacing 0.10 m thickness	-	Lump Sum	Lump Sum	385,000.00	385,000.00
Total Price for Schedule 1C4					**Baht**	**2,254,890.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C5 : Water Supply System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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 Scope of work See Dwg.CYP-C-9	Lump Sum	Lump Sum	725,611.00	725,611.00
Total Price for Schedule 1C5					**Baht**	**725,611.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C6 : Drainage System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C6-1	Drainage System	Design by contractor, Dwg No. CYP-C-6 01/01, See scope of work	Lump Sum	Lump Sum	3,985,914.00	3,985,914.00
1C6-2	Drainage System (Existing to be removed)	Design by contractor, Dwg No. CYP-C-6 01/01, See scope of work	Lump Sum	Lump Sum	35,963.00	35,963.00
1C6-3	Dia. 0.15m PVC. Pipe (Class 8.5)	-	Lump Sum	Lump Sum	5,100.00	5,100.00
1C6-4	Dia. 0.15m PVC. Pipe (Class 8.5) (Existing to be removed)	-	Lump Sum	Lump Sum	2,355.00	2,355.00
Total Price for Schedule 1C6					**Baht**	**4,029,332.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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 "sectionG-3 :Local condition	1	set	570,000.00	570,000.00
1C7-2	Test and commissioning for fire protection system in switchyard	-	Lump Sum	Lump Sum	95,116.00	95,116.00
1C7-3	Test and commissioning for fire alarm system in GIS building	-	Lump Sum	Lump Sum	100,000.00	100,000.00
1C7-4	Test and commissioning for inert gas system (Test in Electrical room)	-	Lump Sum	Lump Sum	70,000.00	70,000.00
1C7-5	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)	-	2	set	40,000.00	80,000.00

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MEDIUM COST FOR BID NO. RTS3-S-02

1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
1C7-6	Architectural and Civil engineering design work	-	Lump Sum	Lump Sum	4,910,008.57	4,910,008.57
1C7-7	Fire Protection design work	-	Lump Sum	Lump Sum	448,981.82	448,981.82
1C7-8	Test and commissioning for fire pump system	-	Lump Sum	Lump Sum	77,619.00	77,619.00
1C7-9	Static pile load test	-	2	set	151,500.00	303,000.00
1C7-10	Dynamic Pile load test	-	Lump Sum	Lump Sum	656,400.00	656,400.00
Total Price for Schedule 1C7					**Baht**	**7,311,125.39**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C8 : Miscellaneous

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-1	Warehouse	Design by contractor, HS-WH-0-04 01/19-19/19, SD-PL-0-01, SD-PL-0-02, CYP-C-1, See scope of work	Lump Sum	Lump Sum	7,043,361.00	7,043,361.00
1C8-2	Duplex house	HS-US-0-05 01/14-14/14, HS-US-0-05C 01/06-06-06 HS-US-0-05L 01/04-04/04, HS-US-0-05SN 01/03/03, SD-PL-0-01, SD-PL-0-02, CYP-C-1	Lump Sum	Lump Sum	2,405,071.00	2,405,071.00
1C8-3	Wire mesh fence 1.50 m high(Pad type)	SD-CF-0-03 01/01	Lump Sum	Lump Sum	100,800.00	100,800.00
Total Price for Schedule 1C8					**Baht**	**9,549,232.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-1	Fire Protection System for 230kV Control Building	Designed by Contractor	Lump Sum	Lump Sum	7,589,500.00	7,589,500.00
1C9-2	Fire Protection System for 115kV GIS Building	Designed by Contractor	Lump Sum	Lump Sum	4,098,000.00	4,098,000.00
1C9-3	Foam house with piling work	SD-FH-8-01 01/07-07/07	1	set	1,082,643.00	1,082,643.00
1C9-4	Water storage tank min. capacity 250 cu.m with piling work	WD-UT-0-05	1	set	3,047,631.00	3,047,631.00
1C9-5	Fire pump house with piling work	SD-FPH-8-01	1	set	1,632,530.00	1,632,530.00

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1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-6	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04 01/01	2	set	205,000.00	410,000.00
1C9-7	Bladder tank proportioning system and components	Designed by Contractor	1	set	909,000.00	909,000.00
1C9-8	Fire Protection System for transformer / shunt reactor	Designed by Contractor	2	set	494,865.00	989,730.00
1C9-9	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	4,011,781.08	4,011,781.08
1C9-10	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	851,080.00	851,080.00

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1C9 : Fire Protection System

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TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-11	Fire pump system	Designed by Contractor	Lump Sum	Lump Sum	4,000,000.00	4,000,000.00
Total Price for Schedule 1C9					**Baht**	**28,621,895.08**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D7 : Spare Parts for SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(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	55,026.40	55,026.40			XXXXX	XXXXX
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	63,417.20	63,417.20			XXXXX	XXXXX
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	47,164.70	47,164.70			XXXXX	XXXXX
1D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	60,814.60	60,814.60			XXXXX	XXXXX
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	495,235.40	495,235.40			XXXXX	XXXXX
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	371,956.20	371,956.20			XXXXX	XXXXX
1D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	266,215.40	266,215.40			XXXXX	XXXXX
1D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	487,402.30	487,402.30			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. RTS3-S-02

1D7 : Spare Parts for SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D7-9	Loose pressure gauge completed with necessary fitting for circuit breaker compartment accessories for GIS (1 gauge/1 set precision pressure gauge spare parts for GIS, can be combined with Gas density meter for CB compartment)	1	set	THB	282,293.00	282,293.00			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	106,476.26	106,476.26
Total Price for Schedule 1D7				**THB**		**2,129,525.20**	**Baht**		**Baht**	**106,476.26**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(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)	6		THB	16,281.10	97,686.60			XXXXX	XXXXX
1D11-2	6.10 m. (20 ft.) hook stick, (14 ft universal with male pin and 6 ft pole extention with female pin) for use with the above power fuse	1		THB	35,476.10	35,476.10			XXXXX	XXXXX
1D11-3	Cost of Local Transportation for Item No. 1D11-1 thru 1D11-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	7,989.76	7,989.76
Total Price for Schedule 1D11				**THB**		**133,162.70**	**Baht**		**Baht**	**7,989.76**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D12 : Spare Parts for AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D12-1	Fuse time lag type 800 A	6					19,292.90	115,757.40	XXXXX	XXXXX
1D12-2	Cost of Local Transportation for 1D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	6,945.44	6,945.44
Total Price for Schedule 1D12							**Baht**	**115,757.40**	**Baht**	**6,945.44**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D22 : Spare Parts for Grounding Material

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1		THB	518,717.10	518,717.10			XXXXX	XXXXX
1D22-2	Cost of Local Transportation for Item No. 1D22-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	31,123.03	31,123.03
Total Price for Schedule 1D22				**THB**		**518,717.10**	**Baht**		**Baht**	**31,123.03**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D24 : Spare Parts for Control and Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-1	DSS : Spare Parts	-See Bill of Materials for Item No. 1D24-1 -Specification No. 1008	1	SET				7,813,216.00	7,813,216.00	XXXXX	XXXXX
1D24-2	Cost of local Transportation for Item No. 1D24-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	32,551.00	32,551.00
Total Price for Schedule 1D24								**Baht**	**7,813,216.00**	**Baht**	**32,551.00**

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MEDIUM COST FOR BID NO. RTS3-S-02

1D25 : Spare Parts for Fault Recording System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D25-1	DSS : Digital Fault Recorder Equipment	-Spare DFR equipment is same ordering number as supplied in schedule 1AB25-1 -Specification Nos. 1003, and 1008	1	SET				866,479.00	866,479.00	XXXXX	XXXXX
1D25-2	Cost of local Transportation for Item No. 1D25-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	11,398.00	11,398.00
Total Price for Schedule 1D25								**Baht** **866,479.00**		**Baht** **11,398.00**	

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MEDIUM COST FOR BID NO. RTS3-S-02

1E24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1E24-1	Multi-function Protective IED (87L,21BU,67/67N, 81, 27, 50BF, 79, 25, 51S/51SG)	-Supply as Loose Part for Installation at PHON and BAMNET NARONG Substations -IED shall include both I/O Modules (Binary Input, Binary Output, and Analog Input) and four (4) ports of Ethernet (IEC61850 Ed2 Standard with PRP). -Current Input Rating : 5A -The communication link with 87L shall be E1 -Specification No. 1008 -Same Type as Supplied in Item No. 1AB24-1 (Item no.3 in Bill of Material For Item No. 1AB24-1)	3	EA				854,886.00	2,564,658.00	XXXXX	XXXXX

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1E24 : Control and Protection System

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TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1E24-2	E1 CONVERTER	-2 set of Multimode Patch Cord Cable and 2 set 30m of Coaxial Cable (RG179) shall be supplied in each E1 Converter. -Specification No. 1008 -Same Type as Supplied in Item No. 1AB24-1 (Item no.28 in Bill of Material For Item No. 1AB24-1)	3	SET				159,028.00	477,084.00	XXXXX	XXXXX

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1E24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 115 KV CHAIYAPHUM SUBSTATION (GIS)

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1E24-3	Multi-function Protective IED (87L,21BU,67/67N, 81, 27, 50BF, 79, 25, 51S/51SG)	- Supply as Spare Part for Item No. 1E24-1 - Same Type as Supplied in Item No. 1E24-1	1	EA				854,886.00	854,886.00	XXXXX	XXXXX
1E24-4	E1 CONVERTER	- Supply as Spare Part for Item No. 1E24-2 - Same Type as Supplied in Item No. 1E24-2	1	SET				159,028.00	159,028.00	XXXXX	XXXXX
1E24-5	Cost of local Transportation Item No. 1E24-1 thru 1E24-4		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	21,109.00	21,109.00
Total Price for Schedule 1E24								**Baht**	**4,055,656.00**	**Baht**	**21,109.00**

นางสาวเบญญาลักษณ์ ศรลัมพ์
หจตส-ห.
26 ก.พ. 2568

นายสรวิชญ์ หิมะมาน
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
12/17/2024

MEDIUM COST FOR BID NO. RTS3-S-02

2AB24 : Control and Protection System

IMPROVEMENT OF 115 KV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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
2AB24-1	MODIFY EXISTING CONTROL AND PROTECTION	-See scope of Work -Drawing Nos. CYP-E-1.1 and CYP-E-1.2 SH.1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	61,600.00	61,600.00
Total Price for Schedule 2AB24								**Baht**		**Baht**	**61,600.00**

นางสาวเบญญาลักษณ์ ศรลัมพ์
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ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
12/17/2024

Important Information

for

Invitation to Bid No. RTS3-S-02

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-6. Preparation and Delivery of Bids and Article B-1. Preparation of Bids

Details on how to prepare the proposal have been revised. Bids shall be prepared in accordance with the Instructions to Bidders contained in the Bidding Documents in one (1) original hard copy and one (1) electronic copy contained in USB flash drive.

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 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-11. Payment

After each payment is made, the Contractor or beneficiary shall issue and submit the receipt to EGAT as detailed in the paragraph added at the end of this article.

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. RTS3-S-02

(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-1. Invitation

Insert the following as the second and third paragraphs of this article respectively:

" The Letter of Award of Contract to be issued to the successful Bidder will be made after EGAT obtains the Project approval from the Government of Thailand, and the approval for Project implementation from the Government's authority and/or other related entities as required (if any) by Thai laws.

Unless EGAT gets approval as such, the Project and the work under this invitation has to be cancelled. In the event such cancellation is required, all costs incurred by the Bidder in purchasing documents and preparing his bid shall be at his own account and will not be reimbursed by EGAT."

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 1,327,080.- or THB 44,955,000.-.

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 : 115 kV Chaiyaphum Substation (GIS) or Schedule 2 : 230 kV Chaiyaphum 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 : 115 kV Chaiyaphum Substation (GIS) and Schedule 2 : 230 kV Chaiyaphum 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 :

Equipment	Period of Guarantee (Year)
- 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)

SECTION A

INVITATION TO BID

ELECTRICITY GENERATING AUTHORITY OF THAILAND

Nonthaburi
Thailand

INVITATION TO BID NO. RTS3-S-02

SUPPLY AND CONSTRUCTION OF 115 kV CHAIYAPHUM SUBSTATION (GIS) AND IMPROVEMENT OF 230 kV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

(TWO-ENVELOPE)

A-1. Invitation

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 115 kV Chaiyaphum Substation (GIS) and Improvement of 230 kV Chaiyaphum Substation under Transmission System Expansion and Renovation Project Phase 3 as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

A-2. Work Description

The supply and construction of 115 kV Chaiyaphum Substation (GIS) and Improvement of 230 kV Chaiyaphum Substation 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 have one of the following qualifications regarding experiences executing contract of supply and construction substation.

1) Having experience with EGAT in executing at least one (1) contract as contractor (not as subcontractor) for supply and construction of a complete 115 kV or above conventional or GIS substation, with its overall performance satisfactory to EGAT.

2) Having experience in executing at least two (2) contracts as contractor (not as subcontractor) for supply and construction of a complete 115 kV or above conventional or GIS substation with other Electricity Authorities of Thailand or in an overseas country (not his own country).

Experience record of the Bidder or either member of the joint venture /consortium, including experience record derived from being a member of other joint venture or consortium in previous project(s) is acceptable. It is not allowed to combine the experience records of each member of the joint venture/consortium in order to meet the experience requirements.

c. Further to b.1) and b.2) mentioned above, having a record of experience within the last ten (10) years on the technical knowledge and practical experience on design, construction, installation and commissioning of Equipment of a 115 kV or above complete conventional or GIS substation. Bidder shall also demonstrate his capacity to perform Work.

Experience record of the Bidder or either member of the joint venture/consortium, including experience record derived from being a member of other joint venture or consortium in previous project(s) is acceptable, provided that there is a letter from the project owner certifying that the Works as described in c. above were performed by the Bidder or

either member of the joint venture/consortium of this project. It is not allowed to combine the experience records of each member of the joint venture/consortium in order to meet the experience requirements.

With respect to item b. and c. above, reference records of either the parent or affiliated companies of the Bidder or of either member of joint venture or consortium shall not be acceptable. If the Bidder has previously formed as the joint venture/consortium with other company and the experience record(s) of the joint venture/consortium meet(s) the requirement set forth herein, such experience record(s) of the joint venture/consortium is(are) also acceptable as the experience record(s) of the Bidder.

d. 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.d.5 to I.d.7 below. 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 115 kV Ratings of Gas-Insulated Switchgear (GIS). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

   5.1 Having one of the following qualifications:

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

      OR

5.1.2 Having a supply record of Equipment of the type proposed (type of enclosure, interrupter of circuit breaker, rated filling gas pressure) at the nominal system voltage of 110 kV or above, busbar current of 2000 A or above, 40 kA or above, with successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least three (3) substations of which total GIS bays shall not be less than twelve (12).

However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least one (1) substation of which total GIS bays shall not be less than four (4).

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 three (3) substations of which total GIS bays shall not be less than twelve (12) and having minimum one (1) year in an 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.

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.

6. For Control and Protection Panel, having the following qualifications:

6.1 Being local manufacturer.

6.2 Having one of the following qualifications:

6.2.1 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 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 of Equipment layout shall be performed by the manufacturer of control and protection panel under the Substation Control and Protection System Integrator's supervision. However, the design and engineering of the complete substation protection and automation system shall be performed by the Substation Control and Protection System Integrator.

7. For Substation Control and Protection System Integrator

   Having one of the following qualifications:

   7.1 Having successful experience in EGAT's digital substation.

   OR

   7.2 Having at least two (2) records of practical experience on design and implementation of an IEC 61850 based control and protection system of a complete conventional or GIS with 110 kV or above digital substation (both station bus and process bus) with at least two (2) consecutive years of successful operation in overseas utilities (not his own country).

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.5 thru II.d.18 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 115 kV Ratings of Power Circuit Breaker, Disconnecting Switch and Compact Switchgear shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

   5.1 Having one of the following qualifications:

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

      OR

      5.1.2 Having a supply record of Equipment of the type proposed at nominal system voltage of 110 kV or above, 2000 A or above, 40 kA or above, 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.

      However, the Equipment of the type and short circuit current ratings proposed shall have a supply record of successful operation/use of at least three (3) consecutive years in an overseas country (not his own country) and at least one (1) three phase set.

      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 an 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.

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.

6. For 115 kV Ratings of following Equipment: Instrument Transformer and Surge Arrester. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

6.1 Having one of the following qualifications:

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

OR

6.1.2 Having a supply record of Equipment of the type and ratings proposed with successful operation/use of at least three (3) three phase sets and having minimum three (3) 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 three (3) three phase sets and having minimum one (1) year in an 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.

6.2 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.

7. For 33, 22 and 11 kV ratings of following Equipment : Metal-Clad SF_6 Gas Insulated Switchgear, Power Circuit Breaker, Instrument Transformer, Disconnecting Switch and Surge Arrester

Having one of the following qualifications:

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

OR

7.2 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 an 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.

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

8. 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

8.1 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, Compression Connector and Miscellaneous Hardware, Thermite Welding Material and Conduit.

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

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

8.3 Having one of the following qualifications:

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

OR

8.3.2 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).

9. For Insulator

Having one of the following qualifications:

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

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

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

OR

9.2 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).

10. For Stationary Battery

Having one of the following qualifications:

10.1 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

10.2 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).

11. For above 33kV through 115 kV Outdoor Type Cable Termination and Cable Termination for GIS.

    Having one of the following qualifications:

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

    OR

    11.2 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.

12. 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.

13. For Fault Recording System.

    13.1 Having one of the following qualifications:

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

        OR

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

13.1.2.1 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

13.1.2.2 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.

13.2 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

14. For supervisory software of IEC 61850 based substation control and protection system:

Having at least one (1) supply record of implementing supervisory software in IEC 61850 based substation control and protection system which comprises at least two (2) manufacturers of protective Intelligent Electronic Device (IED) with successful operation and use of at least one (1) year.

15. For Merging Unit (MU)

Having one of the following qualifications:

15.1 Proposing the MU of the type and rating which has already been successfully operated in EGAT's digital substation.

OR

15.2 Proposing the MU from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY (regardless of country) attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications.

AND

Having supply records of at least three (3) digital substations (both station bus and process bus) of the type proposed with at least three (3) consecutive years of successful operation at nominal system voltage of 110 kV or above in overseas utilities (not his own country).

16. For Bay Control Unit (BCU)

    Having one of the following qualifications:

    16.1 Proposing the BCU of the type and rating which has already been successfully operated in EGAT's digital substation.

    OR

    16.2 Proposing the BCU from the manufacturers as listed in EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY (regardless of country) attached at the end of Section A. Invitation to Bid and shall be in compliance with the details specified in EGAT's Specifications.

    AND

    Having supply records of at least three (3) digital substations (both station bus and process bus) of the type proposed with at least three (3) consecutive years of successful operation at nominal system voltage of 110 kV or above in overseas utilities (not his own country).

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

18. For Closed-circuit television (CCTV) system and equipment

    18.1 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.

    18.2 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.

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

        18.3.1 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

        18.3.2 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.

18.4 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:

Complete substation: New substation or Extension of the existing substation which comprise of at least one transformer circuit and one line circuit.

All above scope may not be necessary to include the building construction and the civil works by themselves. However, the design, supervision, and execution of the buildings and the civil works shall be required.

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 ***hard copy and one (1) electronic copy contained in USB flash drive***, 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 ***in a separate envelope.***

For preparation of original hard copy, each page of the original hard copy shall be marked with the volume number and the page number in the lower right-hand corner, for example, Volume 1 of 10 and Page 1 of 100.

For preparation of electronic copy, each volume of the signed original hard copy shall be scanned into one (1) PDF file and each PDF file shall be named according to the volume number.

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

Envelope I which shall ***consist of the original hard copy of technical proposal, and a USB flash drive containing the electronic files of the original technical proposal in PDF and Excel format, as required by EGAT, and***
Envelope II which shall ***consist of the original hard copy of price proposal, and a USB flash drive containing the electronic files of the price proposal in PDF and Excel format, as required by EGAT.***

In the event of any discrepancy between the original hard copy and the electronic copy, the original hard copy shall govern.

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. RTS3-S-02

SUPPLY AND CONSTRUCTION OF 115 kV CHAIYAPHUM SUBSTATION (GIS) AND IMPROVEMENT OF 230 kV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

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

h. USB flash drive containing electronic files of the original technical proposal in the following formats :-

- PDF files of all pages of each volume of the technical proposal, and

- Excel files of filled-in Proposal Data.

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. RTS3-S-02

SUPPLY AND CONSTRUCTION OF 115 kV CHAIYAPHUM SUBSTATION (GIS) AND IMPROVEMENT OF 230 kV CHAIYAPHUM SUBSTATION

TRANSMISSION SYSTEM EXPANSION AND RENOVATION PROJECT PHASE 3

PRICE PROPOSAL

The Envelope for the price proposal shall contain the following :

a. price schedules according to Section C

b. ***Discount Form***

c. USB flash drive containing electronic files of the price proposal in the following formats :-

- PDF files of all pages of each volume of the price proposal, and

- Excel files of filled-in Price Schedule

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
Bangkruai, 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 270.- or Baht 8,000.-; these prices include the value added tax.

International Procurement Department - Transmission Segment
Procurement and Inventory Management Division
Electricity Generating Authority of Thailand
Bangkruai, 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 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.

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

1. 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.
2. The control and protection panel shall be manufactured and designed by the manufacturer/company written in the same row.

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

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

Sep 2023

EGAT Accepted Multifunction Relay List

Manufacturer	Model	87L			21P			21BU			25			79			67			51			50BF			50EF			27/59			81			24			87K/87R/87C			87B (H)			87B (L)			60C (V)			60C (I)			Remark
		500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	
ABB	RED670 (*)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	REL670 (*)				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	RET670 (*)																			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■													
	RET650 (**)																																		*	*	*												* 3-restraint
	REB650 (**)																																					■	■									
	REB670 (*)																																								■	■	■						
	REB500																																							■	■	■						
	REQ650 (**)										*	*	*												■																								* Only product version 2.1 is accepted.
GE	P543 (**)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	L90 (*)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	P443 (*)				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	D30									■																																							
	D60 (*)				■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■															
	ALPSDA1				■	■	■	■	■	■																																						
	P64x (*)																			**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	**	*	*	*										* Only P643, P645 ** Only P643
	T35																																				■	■									
	T60 (*)																■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
	P746																			*	*	*	*	*	*	*	*	*												■	■	■						* Must add 1 Relay for ground unit (More than 6 bays case)
	P740 (*)																																						■	■	■						
	P747																																						■	■	■						
	B90 (**)																																						■	■	■						
	B30																																						*	*	*						* Only for breaker and a half, double bus double breaker or main and transfer bus arrangement
	P14Nx																			■	■	■	■	■	■																							
	P14Dx (**)										■	■	■		*		■	■	■	■	■	■			**				■	■	■	■	■	■									■	■	■	■	■	■	* Only 3 Pole recloser function ** Only 3-phase breaker failure function
	P841										■	■	■				■	■	■	■	■	■																											
	P141 (**)																			■	■	■			■																									
	C60																								■																									
	F60										■	■	■			■				■	■	■			■																									
	F650 (**)										■	■	■			■				■	■	■																											
	SR350																			■	■	■																											

Oct 2023

EGAT Accepted Multifunction Relay List

Manufacturer	Model	87L			21P			21BU			25			79			67			51			50BF			50EF			27/59			81			24			87K/87R/87C			87B (H)			87B (L)			60C (V)			60C (I)			Remark
		500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	
GE	DRS															*																																	
	P94Vx																																																
	MIV																																															
	P94V																												*	*	*																		* None of VT input (open delta connection) for 59N.
	P143 (**)															*																																	* Only 3 Pole recloser function
SEL	SEL-311L																																															
	SEL-411L (*)																																														
	SEL-421 (*)																																														
	SEL-311C																																														
	SEL-387																																							*	*							* 4-restraint
	SEL-487E (*)																																														
	SEL-587																																								*						* 2-restraint
	SEL-787 (**)																																								*						* 4-restraint
	SEL-587Z																																														
	SEL-487B (*)																																														
	SEL-501																																														
	SEL-351A																																														
	SEL-451 (*)																																														
	SEL-751 (**)																																														
	SEL-551																																														
	SEL-751A																																														
Siemens	7SD52 (**)																																														
	7SA522 (**)																																														
	7SA6 Series (**)																																														
	7SA87 (*)																																														
	Duobias (**)																																														
	7UT6 (**)																																							*	*	*						* 5-restraint
	7UT82 (**)																																							*	*	*						* 2-restraint
	7UT86 (*)																																							*	*	*						* 3-restraint
	7SS52 (**)																																														
	7SS60																																											*	*	*				* Only for breaker and a half, double bus double breaker and main&transfer bus arrangement
	7SS85 (*)																																														
	7VK6 Series (**)																																														

Oct 2023

EGAT Accepted Multifunction Relay List

Manufacturer	Model	87L			21P			21BU			25			79			67			51			50BF			50EF			27/59			81			24			87K/87R/87C			87B (H)			87B (L)			60C (V)			60C (I)			Remark
		500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	
Siemens	7SJ62 (**)																																																
	7SJ85 (*)															*									**																									* Only 3 Pole recloser function ** Only 3-phase breaker failure function
	7SJ61 (**)																																																
	7SJ82 (**)																																																
	7VK61 (**)																																																
	7SL82 (**)																																																
	7SL87 (*)																																																
	7RW80 (**)																																																
	7SA82 (**)																																																
Toshiba	GRZ200 (*)																																																
	GRT200 (*)																																																
	GRD200 (*)																																																
	GRE140																																																
	GRB200 (*)																																																
	GRL200 (*)																																																
Schneider Electric	P543 (*)																																																
	P443 (*)																																																
	P645 (*)																																					*	*	*										* 5-restraint
	P746 (*)																																																
	P740 (**)																																																
	P821																							*	*																									* Only firmware version 1.F is accepted
	P141 (**)																																																
	P143 (**)																																																
	P120																																																
	P122																																																
ZIV	ZLV																																																
	IDV																																																
	IRL																																																
	IRV																																																
Ingeteam	EF-LD (*)																																			*	*	*							**	**	**				* Only 2-step overfluxing relay ** Only for open delta connection
	EF-ZT (*)																																											*	*	*				* Only for open delta connection

Oct 2023

EGAT Accepted Multifunction Relay List

Manufacturer	Model	87L			21P			21BU			25			79			67			51			50BF			50EF			27/59			81			24			87K/87R/87C			87B (H)			87B (L)			60C (V)			60C (I)			Remark
		500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	500 kV	230 kV	115 kV	
Ingeteam	EF-TD (*)																																		*	*	*							**	**	**				* 3-restraint ** Only for open delta connection
	EF-MD (*)																																											*	*	*				* Only for open delta connection
	DA-PT (**)																																											*	*	*				* Only for open delta connection
NR Electric	PCS-931 (*)																																																
	PCS-902 (*)																																																
	PCS-978 (*)																																																
	PCS-9611 (*)																																															*	* Only 1 unbalance input current.
	PCS-978S (*)																																															
	PCS-9611S (*)																																														*	* Only 1 unbalance input current.
	PCS-915SC (*)																																															
Mitsubishi	MRD-HA (**)																																							*										* 3-restraint
	MBP-H1A (**)																																												*	*				* In case of double bus single breaker arrangement, maximum 8 feeders with 1 bus coupler and 2 bus sections are allowed.
Protecta	DTIVA-E3																																															
	DTVA-E1																																															
	DTRV-E2																																															
	DGYD																																															

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 relay 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 relay 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 MULTIFUNCTION RELAY 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 relay 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.
3. The relays shall be configured to comply with all EGAT's required functions.

Oct 2023

SECTION H

SCOPE OF WORK

SCOPE OF WORK

H-1.General

1. 115 kV CHAIYAPHUM SUBSTATION (GIS)

GENERAL

The renovation of Chaiyaphum Substation project to construct new 115kV Gas Insulated Switchgear (GIS) substation is initiated in order to replace the existing 115kV conventional substation, which have been utilized for many years shall no longer be in operation after the completion of new GIS substation.

The Chaiyaphum Substation is located at Phon Thong sub-district, Mueang Chaiyaphum District, Chaiyaphum province. The renovation of Chaiyaphum Substation consists of the 115kV GIS substation with Breaker & A Half scheme. During the new 115 kV Gas Insulated switchgear (GIS) construction, the renovation will be operated beside the existing 115 kV conventional substation due to the limited area.

Twelve (12) Feeders Six (6) Diameters of Breaker & A Half scheme at the new 115 kV GIS shall be provided for transmissions lines and autotransformers as follows :

- Three (3) feeders for 115 kV Lines No. 1 & 2 & 3 to PEA
- One (1) feeders for 115 kV Lines to Phon
- Two (2) feeders for 115 kV Lines No. 1, 2 to BAMNET NARONG

  (Plug-in 115kV XLPE cable 1x1/C 800 Sq.mm. per phase)
- Two (2) feeders for 200MVA, 230-121-22kV power transformer “KT2A & KT4A”
- Three (3) feeders for 115 kV Lines (Future)

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 these 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 : 115 kV CHAIYAPHUM SUBSTATION (GIS)

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:

For Electrical work

1. GIS Substation

1.1. Design, supply and installation of equipment required for a complete new 115kV GIS digital substation and 22kV-400/230V power supply system.

1.2. Design, supply and installation of miscellaneous hardware required for the following:

1.2.1. The connection between the 230kV and 115kV substations.

1.2.2. The connection of the 115kV GIS air bushings to the 200MVA, 230/115-22kV auto-transformers (KT2A, KT4A)

1.2.3. The connection of the 115kV GIS air bushings to the 24MVAR, 115kV shunt capacitor bank No.1

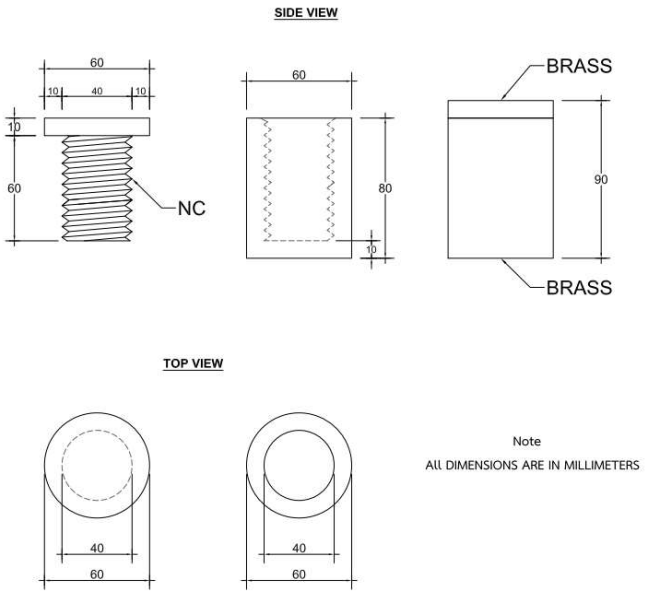
1.2.4. The connection of the 200MVA, 230/115-22kV power transformers (KT2A, KT4A) to the 22kV Load break switch for station service system.

1.2.5. The connection of 115kV GIS air bushings to 115kV overhead lines.

1.2.6. The grounding equipment and miscellaneous hardware for 24MVAR, 115kV shunt capacitor bank No.1

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 buildings. The positions of the marking pins shall be shown on the drawings for future GIS extension and the quantity shall not be less than 4 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 contractor shall supply the cart for transporting the equipment from the loading area to the 115kV GIS room for construction and maintenance.

1.8. 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.

1.9. The contractor shall supply identification plates for the both indoor and outdoor substation. The material, size and color shall be as shown on attached drawings except size of GIS identification plates shall be proposed by the contractor and approved by EGAT.

1.10. 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.

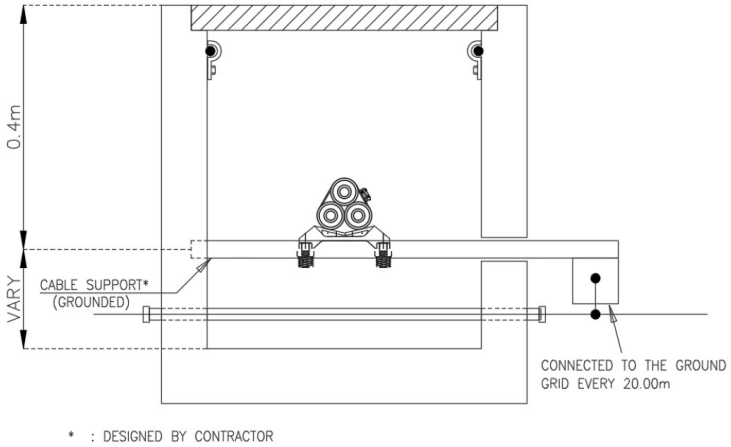
1.11. Design, supply and installation of 22kV XLPE cable system which comprises at least the following:

1.11.1. The design and calculation of the 22kV cable system shall conform to IEC and/or IEEE standards.

1.11.2. The 22kV XLPE cable shall be single-core with copper conductor.

1.11.3. Design, supply and installation of the 22kV XLPE cables in a 22kV system complete from one end at the 22kV bus to the 22kV load break switch, the station service transformers KW2A and KW4A, including cable trench, 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, structures and hardware.

1.11.4. The 22kV XLPE cable shall be installed in trefoil formation.



1.11.5. The minimum bending radius of the 22kV XLPE cable shall be checked by contractor for cable installation and cable trench design.

1.11.6. The contractor shall design the 22kV cable system such that one (1) 1/C-35 Sq.mm. XLPE cable shall be able to carry the continuous current not less than **50A** respectively given that the ambient temperature is no 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 single-line diagram.

1.11.7. 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.

1.11.8. 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.

1.11.9. Design, supply and installation the equipment to protect the power cable from the surge and over-voltage.

1.11.10. The abnormal condition which occurs from the design and installation of the 22kV XLPE cable system for example the Ferro resonance etc, shall be responsible for the contractor.

1.11.11. 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.

1.11.12. 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. The cable cleats shall be metallic hot dip galvanized.

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:

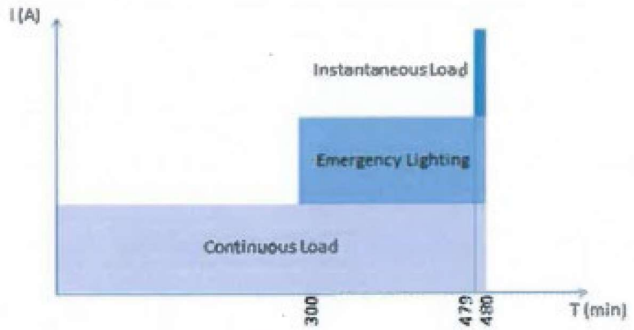
- 500kVA, 22,000-400/230V distribution transformer (KW2A)
- 500kVA, 22,000-400/230V distribution transformer (KW4A)
- Load Center Unit Substation (LCUS)
- 22kV drop-out fuses
- 22kV Load break switches
- 600V, 800A safety switches
- 22kV equipment, and AC&DC distribution boards, stationary batteries, battery chargers, power cables and all related equipment for the complete operation.

2.2. Design, supply and installation of equipment required for a complete 400/230V power supply system.

2.3. Design, supply and installation of the stationary battery, in which the battery is capable of delivering power to the control and protection for tripping all circuit breakers and emergency essential load for at least **8** hours 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

2.4. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers as shown in figure below. 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 existing 230kV AIS and new 115kV GIS 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 2,600Ah.



Battery Duty Cycle

2.5. Emergency lighting system shall be installed at the new control building, 230/115kV GIS building in case of normal station service fails. The said emergency lighting system is activated and capable of generating illumination level of at least **150 LUX** for at least 3 hours.

3. Grounding system

3.1. Design, supply and installation the grounding system of New 115kV GIS substation grounding system including the grounding system of 230/115kV control building , 115kV GIS building and 22kV system

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

3.3. The ground grid conductor spacing under the building area shall be 10 meters.

3.4. Design, supply and installation of the grounding equipment and miscellaneous hardware for 115/22kV system including the 22kV power supply system and 22kV XLPE cable system.

3.5. The contractor shall evaluate the price of ground grid for the additional area based on the specified design for price reference as below:

3.5.1. The maximum ground grid conductor spacing (D0) shall be **10** meters.

3.5.2. The number of ground rod shall be **24** pieces.

3.6. The contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.

3.7. 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.

4. Lightning protection system

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) of:

a) 900kV for 230kV substation.
b) 550kV for 115kV substation.

shall be used in calculation instead of Critical Flashover voltage (CFO).
For 22kV substation, the stroke current of **2kA** shall be used for the calculation.

4.2. For the design of lightning protection system for the control building and GIS buildings, 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

5.1.1. Design, supply and installation of a substation 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, 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

5.2.1. Design, supply and installation of the facility system which mainly consists of power supply, lighting system, lightning protection system, grounding system, power supply, fire alarm and protection system, air conditioning system, ventilation system and telephone & LAN system in the 230/115kV Control building and 115kV GIS buildings. All cable wiring systems shall conform NEC and IEC standards or accepted international 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. The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated current.

5.4. The voltage drops from the safety switch to the AC boards and from the AC boards to the load shall not exceed 3% and 2% respectively.

5.5. 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 tower installed on the roof deck of the 230/115 kV control building. 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. Other Work

7.1 Supply and Installation of miscellaneous hardware required for suspension and post insulators assembly

7.2 Modification of junction box supporting structure (JB001) for the installation of safety switches.

7.3 Modification of junction box supporting structure (JB003) for the installation of outdoor receptacle box (ORB3).

7.4 Modification of BS202 and BS203 for installation of 22kV XLPE cables, 22kV power fuses, 22kV voltage transformer and junction box (PT6)

7.5 Removal of equipment. 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 Nakhon Ratchasima 2 Substation. Nakhon Ratchasima 2 Substation is located at Tumbon Ban Mai, Amphoe Mueang, Nakhon Ratchasima Province

7.6 The Contractor shall Design, supply and installation cable with equipment required for connect cable to new operator house, foam house, fire pump house, warehouse and underground water tank for living area.

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

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 GIS with control building or 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

8.1 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 panel
- 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.

8.2 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.

8.3 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.

8.4 All documents and drawings shall be certified and signed by the Contractor's authorized senior professional engineers certified by Thailand's Council of Engineers.

8.5 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 60kWp, with successful operation of at least two (2) consecutive years.

8.6 Testing and commissioning of the grid-connected solar PV rooftop system shall conform to the internationally-accepted standards.
8.7 Mentoring and training to EGAT's operating staff for operation and maintenance
8.8 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.

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 115kV shunt capacitor bank No.1
2. Supply station post and suspension insulators.
3. The stringing work for the connection between the 115 kV substation take-off structures and the dead-end towers of the transmission lines.

CONTROL AND PROTECTION PART

Schedule 1 : 115 kV CHAIYAPHUM SUBSTATION (GIS)

1. Works Included in This Contract for 115 kV CHAIYAPHUM Substation

1.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system based on IEC 61850 standard which comprises at least the following equipment:

For Process Level
- Merging unit cubicle
- 400/230 VAC board, 125 VDC power panel and 125 VDC distribution board

For Bay Level
- Protective IED panel (swing-rack type)
- Bay Control Unit (BCU) panel (swing-rack type)
- Metering panel (swing-rack type)
  Each energy meter shall be calibrated by EGAT's Energy Meter Department before being installed in each metering panel.
- Ethernet switch panel for station bus (19" rack type)
- Ethernet switch panel for process bus (19" rack type)
- Fault Recording System (FRS) panel (19" rack type)
- 400/230 VAC board, 125 VDC power panel and 125 VDC distribution boards

For Station Level
- GPS receiver and gateway panel (19" rack type)
- Outdoor antenna and accessories
- HMI and accessories
- Engineering workstation (EWS) and accessories
- Redundant UPS systems to power HMI and EWS
- Complete set of operator console and chair
- 400/230 VAC board, 125 VDC power panel and 125 VDC distribution boards

For Loose Part
- Optical fiber cables, copper cables, patch cord 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.
- EFLEX conduits for optical fiber cables inside/outside buildings Outdoor optical fiber cables shall be wired in EFLEX conduits laying in cable trench as per drawing no. TP-E-20.13
- Loose equipment as specified in price schedule.

1.2 Design, supply, installation, wiring, test and commissioning of complete operator console, engineering workstations, HMIs, gateways, and all required system software and hardware in order to successfully run IEC 61850 based substation protection and automation system together with the existing EGAT's SCADA system which at least consists of National Control Center (NCC), Backup National Control Center (BNCC), Regional Control Center (RCC), Backup Regional Control Center (BRCC), Group Control Center (GCC), and Backup Group Control Center (BGCC). In addition, IEC61870-5-104 is used for EGAT's SCADA system. HMIs and engineering workstation shall be of the separated industrial desktop computers running on the latest licensed Microsoft Windows operating system with the licensed antivirus program.

1.3 The System Integrator (SI) shall be responsible for at least the following scope of works:

- Design the complete IEC 61850 based substation protection and automation system as well as the communication network based on IEC 61850 standard in order to coordinate with the existing equipment and/or equipment supplied by EGAT.
- Configure each IED and communication network in order to completely fulfill the designed IEC 61850 based substation protection and automation system.
- Design the engineering workstation, HMIs, gateways and all required system software in order to successfully run the IEC 61850 based substation protection and automation system. In addition, the signal lists to be displayed / controlled via engineering workstation, HMIs and the remote EGAT's SCADA shall be discussed with EGAT after the Award of Contract.
- Perform at least the following tests:
    - Individual test
      This test is to verify each IED performance which shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the internal logic of each IED shall be adapted according to EGAT's comments in case the IED performance does not fulfill EGAT's requirements.
    - Service setting test
      This test is to verify the response of all protection related functions with the calculated parameters setting implementation for all IEDs. The calculation report using the given data which will be provided after the Award of Contract shall be done by the System Integrator and submitted to EGAT for approval before configuring to all IEDs.
    - Factory Acceptance Test (FAT)
      This test is to verify system performance with configured IEDs which shall comply with EGAT's Specifications as well as the relevant drawings and documents.
    - Site Acceptance Test (SAT)
      This test is to finally verify the complete IEC 61850 based substation protection and automation system with the existing equipment and/or equipment supplied by EGAT at site which the system performance shall comply with EGAT's Specifications as well as the relevant drawings and documents. In addition, the test will be under EGAT's supervision.

  All test reports shall at least clearly show the following details:
    - Test procedures
    - All used data such as parameters, standards, and etc.
    - Test results
    - Conclusion.

  In addition, all tests shall be witnessed by EGAT's staff. Moreover, EGAT shall have access to all necessary data for complete understanding of the tests as well as the validity of the results.

1.4 The Contractor shall be responsible for providing both hardcopies and electronic files of the complete schematic and wiring diagrams of the IEC 61850 based substation protection and automation system including programmable logic schemes of each IED, programmable logic schemes of parallel transformer (if any), HMI graphic display, SSD files, ICD files, SCD files, CID files, signal lists of SV, GOOSE and MMS, and communication network connection diagram. Moreover, the required software for the above-said SCL files configuration shall also be supplied. In case of the SCD file configuration, the supplied software shall be compatible with all IEDs operated in the substation and shall also support multi-vendor IEDs. In addition, the Contractor can use the substation system network topology on drawing no. TP-E-20.3 as a guideline.

The said drawing can be modified by the Contractor. However, it shall be submitted to EGAT for approval.

1.5 The Contractor shall be responsible for providing both hardcopies and ACAD files of the complete schematic and wiring diagrams of the interfacing work between IEC 61850 based substation protection and automation system and the existing equipment and/or equipment supplied by EGAT. In addition, the approved final revision of green-red drawings and final drawings shall be printed and submitted in A1 paper size.

1.6 The Contractor shall provide the draftsman working at the site during the commissioning stage in order to be in charge of writing the as-built drawings of control and protection system.

2. Works Not Included in This Contract for 115 kV CHAIYAPHUM Substation

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COMMUNICATION PART

Schedule 1 : 115 kV CHAIYAPHUM SUBSTATION (GIS)

The scope of work for the CCTV system

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 : 115 kV CHAIYAPHUM SUBSTATION (GIS)

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of
   - 1.1 115 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).
     - 1.1.6 115 kV GIS Building shall be designed with reference to Standard 115 kV GIS Building (Dwg. No. SD-GIS-7-02A) Equipment layouts and cable block out shall conform to electrical drawing Dwg. No. SE-GIS-0-01 and Dwg. No. CYP-S-2 and Dwg. No. CYP-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.
       - 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.
       - Overhead traveling crane, of lifting capacity not less than 5 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 and room name sign on each room.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- Lightning protection system.
- Emergency lighting system.
- 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.

1.2 Warehouse 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 Warehouse Building (20x40m.) with workshop area shall only be designed with reference to Warehouse drawing (Dwg.No. HS-WH-0-04.)

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 Warehouse drawings attached in bidding document are for guidline only. For effective design, these following materials shall be re-designed.

- Lighting tiles size (0.80 x1.20 m.) in Elevation 2 and 4 shall re-design to Translucent roof sheet.
  - Material: Reinforced glass fiber shall be manufactured in order to match metal roof profile.
  - Size: 0.70 x 7.00 m.
  - Light Transmission: ≥70±5%
  - UV Stabilizer
  - The Product is certified to Australian Standard AS 4256.3 :2006 and Thai Industrial Standard TIS 612-2549
  - With 10 years guarantee of material.

- Roof of Warehouse shall re-design to PU Sandwich roofing.
  - Metal sheet Roofing (Bolt System)
  - Aluminum-zinc alloy coated not less than 150 g/m² (AZ150)
  - The base metal (BMT) thickness shall not be less than 0.42 mm.
  - Total after painted (APT) thickness shall not be less than 0.51 mm.
  - The Minimum yield strength of 550MPa (G550) Finish coating
  - *Front side : Primer not less than 5 micron and not less than 17-20 micron polyester resin on the top coat
  - * Back side : not less than 10 micron polyester resin on the back side
  - Insulation cover material: Bottom facing Metal sheet
  - Color is specified later
  - The material with TIS 2228-2565 standard ref.AS 1397 (Substrate)
  - The material with TIS 2753-2559 standard ref.AS/NZS 2728-2013 (Painted)
  - With 10 years guarantee of material and installation.

  Insulation System
  - Material:Polyurethane cellular plastic foam injection
  - Closed cell content: >95%
  - Thickness: Not less than 50 mm.
  - Middle layer: Polyurethane (PU) insulation 50 mm. thickness with 35 kg/m^3
  - Water absorption (g.cm/m^2 per day/mm.Hg): AVE.2.0% (by Vol.)
  - Thermal Conductivity (K-value): <0.0023+-0.003 W/m.k
  - Flammability: Self-Extinguishing grade B2
  - Blowing agent (NON CFC11): NEW TYPE 141B
  - Burning Characteristic: Self-extinguishing grade B2
- The rain gutter for metal sheet roofing system shall be made of 4 mm. thk. fiber-glass and with 10 years guarantee of material and installation.
- Rolling Shutter door ‘s material specification in reference drawing shall be cancel. Rolling Shutter door in Elevation 2 shall be re-size into 10 meter wide.

  Rolling Shutter door
  - Not less than 0.70 mm.thk. solid stainless-steel blade with stainless steel frame
  - The full set of rolling shutter door ‘s accessories, motor operation and wind lock equipment.
- Painting Specification
  - For exterior wall, 100% pure acrylic paint, with the highest grade of the chosen brand, contain no added lead and no add mercury, the color is a UV protective type and volume solid not less than 30%, color specified later, combination with 2 color, is required for exterior paint, 2-3 times top coating after primer system, with not less than 10 years warranty.
  - For interior wall, the 100% pure acrylic paint, with the highest grade of the chosen brand, contain no added lead and no add mercury, volume solid not less than 30%, color specified later, combination with 2 color is required, with not less than 10 years warranty.

- For exterior wall and interior wall, the primer shall be in accordance with TIS 1123-2555: Masonry primer, and the top coat shall be premium grade in accordance with TIS 2321-2549: Weather resistant emulsion paints. The primer paint shall be the same brand as the top coat.
- For exterior wall, any parts without paint coated shall be coated with fungus resistant primer.
- For interior steel structure of aluminium composite wall and exterior steel rod suspending the aluminium shading, also the steel supporting of aluminium louvers, the enamel paint shall be in accordance with the instruction of the aluminium composite's manufacturer.
- For steel structure of roofing system, the fire proofing material is required after anti-corrosive primer coating.
- Anti-corrosive primer (orange shade) shall be in accordance with TIS 2386-2551: Anti-corrosive zinc phosphate priming paint. The top coat shall be in accordance with TIS 327-2553: Alkyd gloss enamel. The primer paint shall be the same brand as the top coat.

1.2.10 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.
- Signboard on building and room name sign on each room.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- Lightning protection system.
- Emergency lighting system.

2. Construction of

2.1 230/115kV Control Building

- For Ceiling Finishing : Painted fiber-cement board, joint plaster
  - Material: Fiber cement board, thickness as indicated on Drawings. Seal all cutting edges with approved water repellant or non-staining silicone type.
  - Thickness: Not less than 6 mm. thk.
  - Finishing: Color specified later
  - Fire resistance: Passed BS 476 part 5, 6 and 7 classified as class “0” material
  - Suspension: Galvanized Steel Clamp Rail fixed to manufacturer’s standard
  - Specific properties
    * Density: $\geq$ 1100 kg/m^3
    * Moisture Content : $\leq$ 15%
    * Thermal Conductivity (K value): $\leq$ 0.2 W/m.K
    * Water Absorption : $\leq$ 35 %
- For Ceiling Finishing - Painted fiber-cement board, joint plaster, the said material’s specification in the drawing shall be cancelled.

- 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.

SOLAR ROOFTOP SYSTEM

1. Design and construction of

    1.1 The solar rooftop system for 230/115 kV Control Building.

        1.1.1 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.

        1.1.2 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.

        1.1.3 The steel structure materials shall be hot dip galvanizing by following ASTM standard.

        1.1.4 The tools of construction shall be both properly assembled and disassembled.

        1.1.5 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.

        1.1.6 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.

        1.1.7 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.

        1.1.8 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.

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.

        1.1.1 115 kV GIB & GIS bushing structure and foundation.

        1.1.2 Cable tray for transformer, underground cable in HDPE duct.

        1.1.3 Warehouse (20.00x40.00m.) structure and foundation.

        1.1.4 115 kV RC skid base foundation.

        1.1.5 Outdoor load break switch foundation.

        1.1.6 Cable trench for 22 kV XLPE system.

    1.2 Road and drainage system.

    1.3 Drainage system for cable trench.

2. Construction of
   - 2.1 Steel structure foundation.
   - 2.2 Take-off foundation.
   - 2.3 Equipment structure foundation with sub trench (if required).
   - 2.4 Cable trench.
   - 2.5 RC. Road.
   - 2.6 Crushed rock surfacing.
   - 2.7 Wire mesh fence.
   - 2.8 Site office.
   - 2.9 Lamp post for fence and access road lighting LED type foundation.
   - 2.10 Duplex house.
   - 2.11 Pile cut off

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 and equipment steel support structures shall be submitted to EGAT for approval, according to design codes and standards shown in contract documents and with all possible loadings considered.
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 (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.
8. In case the contractor decides to conduct additional soil investigation and pilot pile test, contractor is to be responsible for any expense incurred.
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 EGAT soil investigation shows that the specified foundations are not appropriate, the Contractor shall design appropriate foundations for approval, according to design codes and standards shown in contract documents.
11. For foundation works that are not specified as pile type and designed by contractor in any contract documents, those foundation works shall be pad type.
12. The Contractor may, at Contractor's own discretion and expense, use any type of pile for "pile foundation to be designed by contractor." The selected type of pile, machine, and method shall comply with engineering practice, construction safety, and shall
13. not damage neighboring structures and equipment.
14. The Contractor shall perform one static load test for both 230/115kV GIS and Control/Relay Building foundations in accordance with ASTM D1143.
15. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles except for driven pile of fence and lamp post.
16. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
17. Plate bearing test for pad foundation according to ASTM D1194-94 shall be submitted to EGAT for approval.
18. 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.
19. Drawing No. SD-PL-0-02 01/01 r.2 in contract documents, if any, shall be replaced with drawing No. SD-PL-0-02 01/01 r.3.

20. 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 54 sq.m for office area, 36 sq.m for conference room which shall both be air-conditioned and 6 sq.m for toilet (flush toilet). The facilities as shown on the section G-3 are required for 3 sets, except for conference and chairs which shall be only 1 set for 20 persons (minimum). The facilities for online conference such as screen, projector, speaker, meeting room microphone, camera shall be provided by contractor.

SOLAR ROOFTOP SYSTEM

Design and construction of solar rooftop system for 230/115 kV Control Building

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.
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.
3. The steel structure materials shall be hot dip galvanizing by following ASTM standard.
4. The tools of construction shall be both properly assembled and disassembled.
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.
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.
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.
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

1. Design and construction of
    1.1 Fire protection system for 115 kV GIS Building.
        1.1.1 GIS Building shall consist of optical beam smoke detector and linear heat detector.
        1.1.2 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 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.
        1.1.3 There shall be sounder and beacon on the roof of the building.
        1.1.4 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

1.2 Fire protection system for 230/115kV Control Building.

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

1.2.2 Fire protection system of Control 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 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.

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

1.2.4 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.

1.2.5 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.

1.2.6 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.

1.2.7 There shall be one control panel which controls fire detection system and IG-100 fire suppression system in the building.

1.2.8 There shall be a protective clear polycarbonate cover which can be immediately lifted or opened for all IG-100 manual release stations.

1.2.9 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.

1.3 Fire protection system for warehouse .

1.3.1 Warehouse fire protection system does not include fire suppression system

1.3.2 Fire protection system of warehouse 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 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.

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

1.3.4 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.
- 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.

1.4 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.

1.5 Fire protection system for the Transformer /Shunt Reactor : The Foam-water spray system shall comply with the following;

1.5.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850

1.5.2 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.

1.5.3 Nozzles : NFPA 16 and as per Manufacturer’s Recommendation

1.5.4 Detection system : Air Expansion Linear Heat Detection System (LHB)

1.5.5 Equipment for system : FM approved, UL Listings , Vds

1.5.6 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.

1.5.7 There shall be one linear heat detector box for each transformer / shunt reactor.

1.5.8 There shall be one control panel, for fire detection and foam/water spray system, which controls all foam/water spray system for each series of KTX protected transformers.

1.6 Fire Pump System. (conforming to NFPA 14, 20, 22, 24, 72).

1.7 250 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 230/115 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.

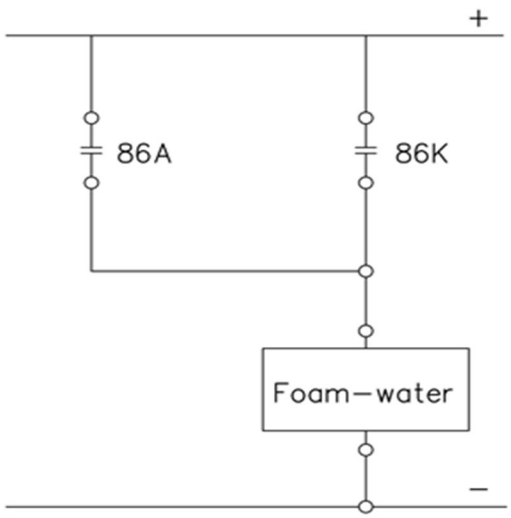
1.8 There shall be one fire alarm system graphic annunciator at each building to enable responding personnel to identify the location of a fire accurately and to indicate the status of emergency equipment or fire safety functions.

1.9 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 located.

1.10 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.

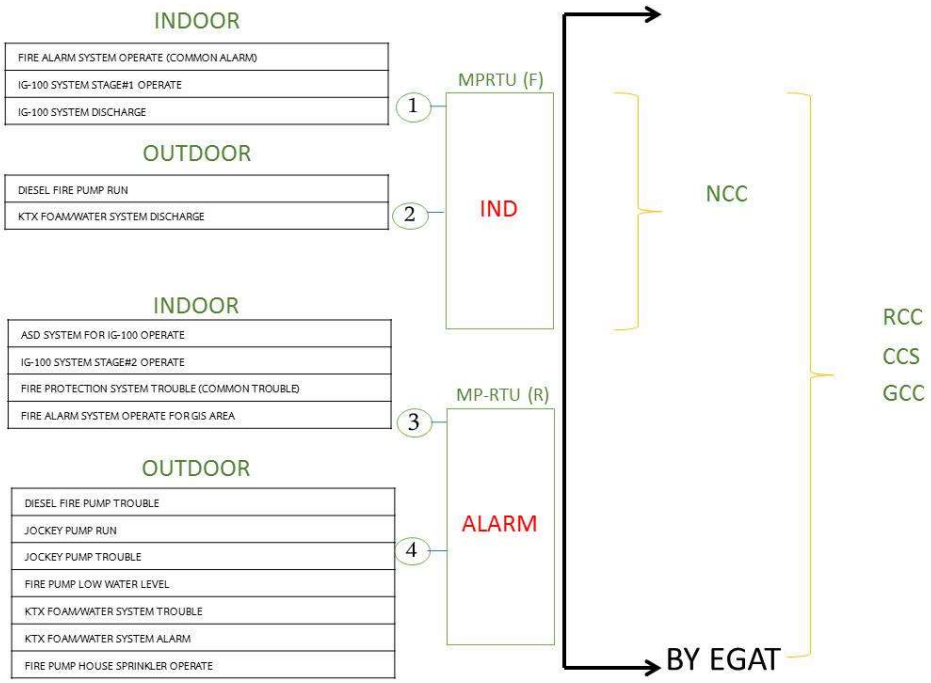
1.11 For Control System Logic as shown on specification 3001-13.4 item 4.1 shall be changed to the new detail as following

(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 ;



1.12 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;



1.13 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.

1.14 Water supply system.

1.15 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.

1.16 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 (CO_2) 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.

1.17 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.

1.18 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.

1.19 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.

1.20 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 230/115 kV Control Building. One set of laser jet printer shall be provided.

1.21 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.

1.22 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.

1.23 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	■ 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

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

1.25 Underground water piping shall have indicator sign.

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

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

1.28 All firestops for penetration from outside cable trenches to cable room and from cable room to under raised floor area shall be multi cable transit fire stop. Other firestops shall be block type being able to be removed and reinstalled conveniently. Firestop catalog and installation detail drawings shall be submitted to EGAT for approval. The cables penetrating from outside the building into building shall be coated with firestop cable coating with the length of 50 cm. measuring from building's exterior wall outward.

2. Construction of
   2.1 Foam house.
   2.2 Fire pump house.
   2.3 Cabinets with 2X50 lbs wheel fire extinguisher.
   2.4 Water storage tank for fire protection system (capacity not less than 250 cu.m).
   2.5 Underground water tank 50 cu.m

CONTROL AND PROTECTION PART

Schedule 2 : 230 kV CHAIYAPHUM SUBSTATION

1. Works Included in This Contract for 230 kV CHAIYAPHUM Substation

1.1 Design, modification, wiring, test and commissioning of the existing protection in order to interface the new 115kV digital substation systems which comprises at least the following work:

- Swing rack type protective relay switchboards
- Control switchboard-enclosed type
- Modify KT2A and KT4A
- Modify Close/Trip circuit of BKR No. 80112, 80122, 80212 and 80222.
- Modify Breaker Failure circuit.
- Add and modify some points of protection which be necessary for complete the function of the control and protection system.
- 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.
- Cables and accessories as well as connection of cables between the existing substation and the new digital substation in order to complete the function of the control and protection system.

1.2 Any modification and interfacing works to the existing 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.

1.3 The Contractor shall be responsible for providing both hardcopies and ACAD files of the complete schematic and wiring diagrams of the control and protection system. In addition, the approved final revision of green-red drawings and final drawings shall be printed and submitted in A1 paper size.

1.4 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. Works Not Included in This Contract for 230 kV CHAIYAPHUM Substation

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