

# 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](mailto:coe@saraban.mail.go.th)

## ประชาสัมพันธ์ผู้ประกอบการเพื่อทราบ

เพื่อให้การดำเนินงานสำหรับงานจ้างก่อสร้างที่มีลักษณะงานด้านการออกแบบหรือควบคุมงานก่อสร้าง สอดคล้องกับพระราชบัญญัติวิศวกร พ.ศ. 2542 จึงขอแจ้งแนวทางในการดำเนินงาน ดังนี้

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

หมายเหตุ หากมีข้อสงสัย โปรดติดต่อ สภาวิศวกร

ที่อยู่ : 1616/1 ถนนลาดพร้าว แขวงวังทองหลาง เขตวังทองหลาง กรุงเทพมหานคร 10310

เบอร์ติดต่อ : 1303

อีเมล : [coe@saraban.mail.go.th](mailto: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](https://www.egat.co.th/privacy-notice-procurement_en.html) or the below QR Code.



## **The Redaction of Sensitive Personal Data**

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

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

## ประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญาของ กฟผ.

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



### การขิดฆ่าข้อมูลส่วนบุคคลอ่อนไหว

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

## Notice to Bidder

### Subject : Online Payment for Purchase of Bidding Documents

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

- 1) Fill-out the Registration Form and upload the proof of payment via the link provided in <https://www4.egat.co.th/fprocurement/biddingeng>

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.

- 2) The registration will be deemed complete only upon successful processing of the payment and confirmation of funds received.
- 3) 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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Invitation to Bid No. TIEC-S-06

(Revision 1)

**Supply and Construction of 500/230 kV Nakhon Ratchasima 4 Substation (GIS)  
and Expansion of 500 kV Chaiyaphum 2 (GIS) and 230 kV Nakhon Ratchasima 3 Substations  
Transmission System Improvement Project in Northeastern, Lower Northern, Central Regions  
and Bangkok Area to Enhance System Security  
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.

**Place of Construction** : 500/230 kV Nakhon Ratchasima 4 Substation (GIS)  
500 kV Chaiyaphum 2 Substation (GIS) and  
230 kV Nakhon Ratchasima 3 Substation

**Medium Cost (including Value Added Tax and other expenses)** : THB 2,360,000,000.-

**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 March 20, 2026 to April 21, 2026 at USD 1,000.- or THB 30,000.- per copy, non-refundable.

Please find more details for online purchasing process at <https://www4.egat.co.th/fprocurement/biddingeng> or contact for further information at telephone no. 66 2436 3347 or [procurement.tse@egat.co.th](mailto:procurement.tse@egat.co.th).

Delivery of Bids

*Technical and price proposal submission date and Technical proposal opening date is postponed from May 21, 2026 around one (1) month.*

ELECTRICITY GENERATING AUTHORITY OF THAILAND

*May 18, 2026*



(Miss Wallapa Chewadhnakorkul)

Chief, Procurement Department - Transmission System Segment



ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย  
เรื่อง ประกวดราคาจ้าง เลขที่ TIEC-S-06  
ประกวดราคาแบบ 2 ซอง

(ฉบับแก้ไข ครั้งที่ 1)

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะการจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500/230 kV นครราชสีมา 4 (GIS) และจัดซื้อและจ้างก่อสร้างขยายลานไก สถานีไฟฟ้าแรงสูง 500 kV ชัยภูมิ 2 (GIS) และ 230 kV นครราชสีมา 3 สำหรับโครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคตะวันออกเฉียงเหนือ ภาคเหนือตอนล่าง ภาคกลาง และ กรุงเทพมหานคร เพื่อเสริมความมั่นคงระบบไฟฟ้า โดยทำสัญญาแบบปรับราคาได้ (ค่า k) โดยใช้งบประมาณ กฟผ.

**สถานที่ก่อสร้าง** : สถานีไฟฟ้าแรงสูง 500/230 kV นครราชสีมา 4 (GIS)  
สถานีไฟฟ้าแรงสูง 500 kV ชัยภูมิ 2 (GIS) และ  
สถานีไฟฟ้าแรงสูง 230 kV นครราชสีมา 3

**ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ)** : 2,360,000,000.- บาท

**คุณสมบัติของผู้เสนอราคา**

1. ต้องเป็นนิติบุคคลผู้มีอาชีพรับจ้างตามประกวดราคาจ้างดังกล่าว และต้องไม่เป็นผู้ทำงานซึ่งปลัดกระทรวงการคลังได้แจ้งเวียนชื่อไว้ หรือต้องไม่เป็นผู้ที่ กฟผ. ห้ามติดต่อหรือห้ามเข้าเสนอราคา หรือต้องไม่เป็นผู้ที่ได้รับผลของการสั่งให้นิติบุคคลหรือบุคคลอื่นเป็นผู้ทำงานตามคำสั่ง 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. ต้องไม่เป็นผู้ได้รับเอกลิขสิทธิ์หรือความคุ้มครอง ซึ่งอาจปฏิเสธไม่ยอมขึ้นศาลไทย เว้นแต่รัฐบาลของผู้เสนอราคาได้มีคำสั่งให้สละสิทธิ์และความคุ้มครองเช่นว่านั้น
5. ผู้ประสงค์เข้าประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม (Joint Venture or Consortium) จะต้องดำเนินการทุกขั้นตอนของการประกวดราคาในนามของกิจการร่วมค้าหรือกิจการร่วม ตั้งแต่การเสนอราคาจนถึงสุดท้ายผูกพันกับ กฟผ.

**การขายเอกสารประกวดราคา**

ผู้สนใจติดต่อซื้อเอกสารประกวดราคา ในราคาชุดละ 30,000.- บาท ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 20 มีนาคม 2569 ถึงวันที่ 21 เมษายน 2569 ทั้งนี้ สามารถดูรายละเอียดการซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ <https://www4.egat.co.th/fprocurement/biddingeng> หรือสอบถามข้อมูลเพิ่มเติมได้ทางโทรศัพท์ หมายเลข 0 2436 3347 หรือ อีเมล [procurement.tse@egat.co.th](mailto:procurement.tse@egat.co.th)

การยื่นขอประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา และเปิดซองข้อเสนอด้านเทคนิค เลื่อนจากวันที่ 21 พฤษภาคม 2569 ออกไปประมาณ 1 เดือน

ประกาศแก้ไข ณ วันที่ 18 พฤษภาคม 2569



(นางสาววัลลภา ชีวธนากรณกุล)

หัวหน้ากองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง

**ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)  
ในการจัดซื้อจัดจ้างที่มีใช้งานก่อสร้าง**

**1. ชื่อโครงการ** Bid No. TIEC-S-06

การจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500/230 kV นครราชสีมา 4 (GIS) และจัดซื้อและจ้างก่อสร้าง  
ขยายลานไกสสถานีไฟฟ้าแรงสูง 500 kV ชัยภูมิ 2 (GIS) และ 230 kV นครราชสีมา 3  
โครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคตะวันออกเฉียงเหนือ ภาคเหนือตอนล่าง ภาคกลาง  
และกรุงเทพมหานคร เพื่อเสริมความมั่นคงระบบไฟฟ้า

/หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

**2. วงเงินงบประมาณที่ได้รับจัดสรร**

โครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคตะวันออกเฉียงเหนือ ภาคเหนือตอนล่าง ภาคกลาง  
และกรุงเทพมหานคร เพื่อเสริมความมั่นคงระบบไฟฟ้า งบประมาณ 94,040 ล้านบาท

**3. วันที่กำหนดราคากลาง** 2 กุมภาพันธ์ 2569 (วันที่ รวร. อนุมัติ)

ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 2,360,000,000.00 บาท ราคา/หน่วย ตามเอกสารแนบ

**4. แหล่งที่มาของราคากลาง**

หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานพัฒนาระบบส่ง

**5. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง**

5.1 นายณัฐ วงศ์เทพวานิชย์ หมฟ-ร. กวอ-ร.

5.2 นายภูภัทร พานทอง หสก-ร. กวอ-ร.

5.3 นายชิตพล จินต์อัจฉริยกุล หวอ-ร. กวอ-ร.

5.4 นางสาวจากรุวรรณ พิพัฒน์มิ่งคลพร หอต-ร. กวอ-ร.

5.5 นายรุหาญ รุจิธัญธาร กวป-ร.

5.6 นายมณฑิร จำปาอ่อน กวธ-ร.

5.7 น.ส.เอกอุพาร เทวารุทธ กวส-ส. อรส.

**หมายเหตุ** ค่าใช้จ่ายอื่นๆ ได้แก่ ค่าใช้จ่ายที่ กฟผ. ต้องจ่ายตามวิธีการพิจารณาเปรียบเทียบราคาที่กำหนดไว้  
ในเอกสารประกวดราคา เช่น อกรขาเข้า เป็นต้น

MEDIUM COST FOR BID NO. TIEC-S-06

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500/230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)  
AND EXPANSION OF 500 KV CHAIYAPHUM 2 (GIS) AND 230 KV NAKHON RATCHASIMA 3 SUBSTATIONS

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht			
			Amount	Amount			
1	500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)	THB	801,318,250.03				
				211,271,458.41	398,313,726.15	290,346.08	124,530,835.34
2	230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)	THB	312,164,716.10				
				56,194,914.45	132,444,368.00	163,577.71	42,584,393.25
3	500 KV CHAIYAPHUM 2 SUBSTATION (GIS)	THB	23,064,212.20				
				21,351,491.30	2,179,365.00	48,241.27	7,733,946.19



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MEDIUM COST FOR BID NO. TIEC-S-06

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500/230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)  
AND EXPANSION OF 500 KV CHAIYAPHUM 2 (GIS) AND 230 KV NAKHON RATCHASIMA 3 SUBSTATIONS

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht			
			Amount	Amount			
4	230 KV NAKHON RATCHASIMA 3 SUBSTATION	THB	18,075,705.50				
				20,350,917.61	4,909,740.00		7,350,154.74
BID PRICE		THB	1,154,622,883.83	Baht	Baht	Baht	Baht
				309,168,781.77	537,847,199.15	502,165.06	182,199,329.52
OTHER EXPENSES		THB	23,092,457.68				

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MEDIUM COST FOR BID NO. TIEC-S-06

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500/230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)  
AND EXPANSION OF 500 KV CHAIYAPHUM 2 (GIS) AND 230 KV NAKHON RATCHASIMA 3 SUBSTATIONS

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Schedule	Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht				
			Foreign Supply	Local Supply							
			CIF Thai Port	Ex-works Price (excluding VAT) Baht							
			Amount	Amount							
	VAT		82,440,073.91	Baht	21,641,814.72	Baht	37,649,303.94	Baht	35,151.55	Baht	12,753,953.07
	SUMMARY OF BID PRICE	THB	1,260,155,415.42	Baht	330,810,596.49	Baht	575,496,503.09	Baht	537,316.61	Baht	194,953,282.59
	TOTAL MEDIUM COST	THB					2,361,953,114.20				
	TOTAL MEDIUM COST (ROUNDED)	THB					2,360,000,000.00				

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**MEDIUM COST FOR BID NO. TIEC-S-06****SCHEDULE 1 : 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)****SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	796,529,368.70	207,308,834.51			124,530,835.34
PART 1C : CIVIL WORK				398,313,726.15		
PART 1D : SUPPLY OF SPARE PARTS	THB	4,788,881.33	3,962,623.90		290,346.08	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>801,318,250.03</b>	<b>Baht</b> 211,271,458.41	<b>Baht</b> 398,313,726.15	<b>Baht</b> 290,346.08	<b>Baht</b> 124,530,835.34




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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB2 : Distribution Transformer	THB		2,892,813.00	289,281.30
Schedule 1AB4 : Surge Arrester	THB	7,843,096.80	865,800.00	870,889.68
Schedule 1AB5 : Current Transformer and Junction Box	THB	927,069.00	101,332.00	102,840.10
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	9,678,330.20	1,424,477.60	1,110,280.78


  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	726,352,092.00		72,635,209.20
Schedule 1AB9 : Power Circuit Breaker	THB	26,750,142.40	6,873,923.10	3,362,406.55
Schedule 1AB10 : Disconnecting Switch	THB	10,161,285.20	1,034,756.00	1,119,604.12
Schedule 1AB11 : Power Fuse, Fuse Link and Hook Stick	THB	1,317,571.20		131,757.12


  
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**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			6,800,076.51	680,007.65
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	6,841,634.80	2,895,538.80	973,717.36
Schedule 1AB14 : Substation Steel Structure			28,185,650.00	7,046,412.50
Schedule 1AB15 : Insulator				162,341.30


  
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**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB16 : Cable Terminations	THB	241,447.80		60,361.95
Schedule 1AB17 : XLPE Power Cable			475,200.00	118,800.00
Schedule 1AB18 : Low Voltage Cable and Conductor			102,282,841.10	25,570,710.28
Schedule 1AB19 : Switchyard Lighting Fixtures			1,810,286.50	452,571.63


  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	835,045.20	413,900.30	312,236.38
Schedule 1AB21 : Bus Fitting	THB	2,845,368.90		711,342.23
Schedule 1AB22 : Grounding Material	THB	2,422,506.90	2,275,979.20	1,174,621.53
Schedule 1AB23 : Substation Miscellaneous	THB	313,778.30	616,284.40	232,515.68

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB24 : Control and Protection System			43,823,554.00	4,540,381.00
Schedule 1AB25 : Fault Recording System				
			4,536,422.00	476,302.00
Schedule 1AB38 : Remote Terminal Unit				
				996,245.00



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 1AB39 : Commissioning				1,400,000.00
<b>PART 1AB</b>	<b>THB</b>	<b>796,529,368.70</b>	<b>Baht</b>	<b>124,530,835.34</b>
			<b>207,308,834.51</b>	



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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 1C : CIVIL WORK

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Local Currency ( excluding VAT ) Baht
	Amount
Schedule 1C1 : Foundation Work	33,995,812.00
Schedule 1C2 : Cable Trench	11,428,328.00
Schedule 1C3 : Building	244,810,571.15
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	11,856,656.00
Schedule 1C5 : Water Supply System	88,786.00
Schedule 1C6 : Drainage System	28,095,497.00
Schedule 1C7 : Special Construction Works	15,268,518.00
Schedule 1C8 : Miscellaneous	6,736,694.00
Schedule 1C9 : Fire Protection System	46,032,864.00
<b>PART 1C</b>	<b>Baht 398,313,726.15</b>



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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 1D : SUPPLY OF SPARE PARTS

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	( excluding VAT ) Baht
		Amount	Amount	Amount
Schedule 1D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	2,180,834.70		109,041.74
Schedule 1D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	140,756.53		7,037.83
Schedule 1D12 : Spare Parts for AC&DC Distribution Board and Termination Box			400,959.90	20,048.00
Schedule 1D22 : Spare Parts for Grounding Material	THB	2,467,290.10		123,364.51

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 1D : SUPPLY OF SPARE PARTS**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation ( excluding VAT ) Baht
		Foreign Supply CIF Thai Port	Local Supply Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	Amount
		Schedule 1D24 : Spare Parts for Control and Protection System		
Schedule 1D25 : Spare Parts for Fault Recording System			529,221.00	12,141.00
<b>PART 1D</b>	<b>THB</b>	<b>4,788,881.33</b>	<b>Baht 3,962,623.90</b>	<b>Baht 290,346.08</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06****SCHEDULE 2 : 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)****SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	309,446,242.10	53,852,136.45			42,584,393.25
PART 2C : CIVIL WORK				132,444,368.00		
PART 2D : SUPPLY OF SPARE PARTS	THB	2,718,474.00	2,342,778.00		163,577.71	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>312,164,716.10</b>	<b>Baht</b> 56,194,914.45	<b>Baht</b> 132,444,368.00	<b>Baht</b> 163,577.71	<b>Baht</b> 42,584,393.25



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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT ) Baht	
		Amount	Amount	
Schedule 2AB4 : Surge Arrester	THB	882,466.20	169,764.00	105,223.02
Schedule 2AB7 : SF6 Gas Insulated Switchgear	THB	304,355,034.00		30,435,503.40
Schedule 2AB12 : AC&DC Distribution Board and Termination Box			1,551,882.95	155,188.30
Schedule 2AB13 : Stationary Battery and Battery Charger	THB	3,420,817.40	1,930,359.20	535,117.66


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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 2AB14 : Substation Steel Structure			4,520,914.00	1,130,228.50
Schedule 2AB15 : Insulator				71,512.65
Schedule 2AB18 : Low Voltage Cable and Conductor			18,698,484.20	4,674,621.05
Schedule 2AB19 : Switchyard Lighting Fixtures			888,583.30	222,145.83

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT ) Baht	
		Amount	Amount	
Schedule 2AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			391,102.80	97,775.70
Schedule 2AB21 : Bus Fitting	THB	531,111.90		132,777.98
Schedule 2AB22 : Grounding Material	THB	234,042.60	432,191.10	166,558.43
Schedule 2AB23 : Substation Miscellaneous	THB	22,770.00	105,600.90	32,092.73

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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB24 : Control and Protection System			17,231,954.00	1,800,674.00
Schedule 2AB25 : Fault Recording System			2,459,108.00	263,118.00
Schedule 2AB33 : CCTV			3,771,192.00	464,645.00
Schedule 2AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel			1,336,000.00	101,000.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 2AB35 : Communication Cable			365,000.00	589,000.00
Schedule 2AB38 : Remote Terminal Unit				607,211.00
Schedule 2AB39 : Commissioning				1,000,000.00
<b>PART 2AB</b>	<b>THB</b>	<b>309,446,242.10</b>	<b>Baht</b>	<b>Baht</b>
			<b>53,852,136.45</b>	<b>42,584,393.25</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 2C : CIVIL WORK**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Local Currency (excluding VAT) Baht
	Amount
Schedule 2C1 : Foundation Work	5,601,601.00
Schedule 2C2 : Cable Trench	3,671,918.00
Schedule 2C3 : Building	90,294,241.00
Schedule 2C4 : Earth Work, Road and Crushed Rock Surfacing	9,384,201.00
Schedule 2C5 : Water Supply System	1,058,556.00
Schedule 2C6 : Drainage System	7,680,471.00
Schedule 2C7 : Special Construction Works	6,191,587.00
Schedule 2C8 : Miscellaneous	80,100.00
Schedule 2C9 : Fire Protection System	8,481,693.00
<b>PART 2C</b>	<b>Baht 132,444,368.00</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 2D : SUPPLY OF SPARE PARTS**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation ( excluding VAT ) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 2D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	2,180,834.70		109,041.74
Schedule 2D22 : Spare Parts for Grounding Material	THB	537,639.30		26,881.97
Schedule 2D24 : Spare Parts for Control and Protection System			1,813,557.00	15,513.00
Schedule 2D25 : Spare Parts for Fault Recording System			529,221.00	12,141.00
<b>PART 2D</b>	<b>THB</b>	<b>2,718,474.00</b>	<b>Baht</b>  <b>2,342,778.00</b>	<b>Baht</b> <b>163,577.71</b>

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## MEDIUM COST FOR BID NO. TIEC-S-06

## SCHEDULE 3 : 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

## SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

## TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht	Local Transportation (excluding VAT) Baht	Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	22,099,386.80	21,351,491.30			7,733,946.19
PART 3C : CIVIL WORK				2,179,365.00		
PART 3D : SUPPLY OF SPARE PARTS	THB	964,825.40			48,241.27	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>23,064,212.20</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>
			<b>21,351,491.30</b>	<b>2,179,365.00</b>	<b>48,241.27</b>	<b>7,733,946.19</b>

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 3AB4 : Surge Arrester	THB	2,614,365.60	288,600.00	319,326.22
Schedule 3AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	4,147,855.80	371,640.80	497,144.63
Schedule 3AB9 : Power Circuit Breaker	THB	13,375,071.20	3,552,648.00	1,862,049.11
Schedule 3AB10 : Disconnecting Switch				615,782.27

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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 3AB15 : Insulator				64,439.76
Schedule 3AB18 : Low Voltage Cable and Conductor			8,724,861.20	2,399,336.83
Schedule 3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	357,258.00		98,245.95
Schedule 3AB21 : Bus Fitting	THB	790,005.70		217,251.57

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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

## SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	
Schedule 3AB22 : Grounding Material	THB	751,582.70	196,597.50	260,749.56
Schedule 3AB23 : Substation Miscellaneous	THB	63,247.80	121,247.80	50,736.29
Schedule 3AB24 : Control and Protection System			8,010,396.00	853,884.00
Schedule 3AB25 : Fault Recording System				25,200.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 3AB35 : Communication Cable			85,500.00	131,400.00
Schedule 3AB38 : Remote Terminal Unit				33,400.00
Schedule 3AB39 : Commissioning				180,000.00



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht Amount
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 3AB40 : Installation of Equipment and Steel Structure Supplied by EGAT				125,000.00
<b>PART 3AB</b>	<b>THB</b>	<b>22,099,386.80</b>	<b>Baht</b>	<b>Baht</b>
			<b>21,351,491.30</b>	<b>7,733,946.19</b>



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## MEDIUM COST FOR BID NO. TIEC-S-06

## PART 3C : CIVIL WORK

## SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Local Currency ( excluding VAT ) Baht
	Amount
Schedule 3C1 : Foundation Work	76,584.00
Schedule 3C7 : Special Construction Works	124,564.00
Schedule 3C9 : Fire Protection System	1,978,217.00
<b>PART 3C</b>	<b>Baht</b> <b>2,179,365.00</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 3D : SUPPLY OF SPARE PARTS**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Transportation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	( excluding VAT ) Baht
		Amount	Amount	Amount
Schedule 3D22 : Spare Parts for Grounding Material	THB	964,825.40		48,241.27
<b>PART 3D</b>	<b>THB</b>	<b>964,825.40</b>	<b>Baht</b>	<b>Baht</b>  <b>48,241.27</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**SCHEDULE 4 : 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Currency	Supply of Equipment		Local Currency (excluding VAT) Baht Amount	Local Transportation (excluding VAT) Baht Amount	Local Transportation, Construction and Installation (excluding VAT) Baht Amount
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht			
		Amount	Amount			
PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	18,075,705.50	20,350,917.61			7,350,154.74
PART 4C : CIVIL WORK				4,909,740.00		
<b>TOTAL PRICE</b>	<b>THB</b>	<b>18,075,705.50</b>	<b>Baht</b> 20,350,917.61	<b>Baht</b> 4,909,740.00	<b>Baht</b>	<b>Baht</b> 7,350,154.74



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**  
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 4AB5 : Current Transformer and Junction Box	THB	3,250,288.80	561,792.40	419,328.93
Schedule 4AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	1,765,005.00	215,291.60	217,832.63
Schedule 4AB9 : Power Circuit Breaker	THB	6,110,388.40		672,142.72
Schedule 4AB10 : Disconnecting Switch	THB	5,491,981.00	1,212,600.00	737,503.91



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**  
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 4AB12 : AC&DC Distribution Board and Termination Box			19,886.91	2,187.56
Schedule 4AB14 : Substation Steel Structure			4,168,008.00	1,146,202.20
Schedule 4AB15 : Insulator				191,390.54
Schedule 4AB18 : Low Voltage Cable and Conductor			5,440,134.70	1,496,037.04



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**PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**  
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 4AB19 : Switchyard Lighting Fixtures			63,412.80	17,438.52
Schedule 4AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			1,777,021.40	488,680.89
Schedule 4AB21 : Bus Fitting	THB	1,143,675.50		314,510.76
Schedule 4AB22 : Grounding Material	THB	182,256.80	315,176.40	136,794.13



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**  
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 4AB23 : Substation Miscellaneous	THB	132,110.00	326,682.40	126,167.91
Schedule 4AB24 : Control and Protection System			3,683,303.00	581,401.00
Schedule 4AB25 : Fault Recording System			2,459,108.00	266,336.00
Schedule 4AB35 : Communication Cable			108,500.00	188,800.00



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**PART 4AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**  
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation ( excluding VAT ) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price ( excluding VAT ) Baht	
		Amount	Amount	
Schedule 4AB38 : Remote Terminal Unit				27,400.00
Schedule 4AB39 : Commissioning				320,000.00
<b>PART 4AB</b>	<b>THB</b>	<b>18,075,705.50</b>	<b>Baht</b>	<b>7,350,154.74</b>
			<b>20,350,917.61</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**PART 4C : CIVIL WORK**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Description	Local Currency
	( excluding VAT ) Baht Amount
Schedule 4C1 : Foundation Work	2,956,458.00
Schedule 4C2 : Cable Trench	1,946,782.00
Schedule 4C7 : Special Construction Works	6,500.00
<b>PART 4C</b>	<b>Baht</b> <b>4,909,740.00</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB2 : Distribution Transformer**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB2-1	500 kVA, 22000-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX2712	2		THB			1,186,883.50	2,373,767.00	XXXXX	XXXXX		
1AB2-2	150 kVA, 400-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX0403	1		THB			519,046.00	519,046.00	XXXXX	XXXXX		
1AB2-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB2-1 thru 1AB2-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	289,281.30	289,281.30		
				<b>THB</b>			<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB2</b>							<b>2,892,813.00</b>		<b>289,281.30</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB4 : Surge Arrester**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB4-1	396 kV Surge Arrester completed with corona ring, grading ring as per Ratings and Features RF SA9Y11	18		THB	435,727.60	7,843,096.80			XXXXX	XXXXX		
1AB4-2	Steel Supporting Structure for SA9Y11 ( for Item No. 1AB4-1 ), H=9.00 m as per Dwg. No. ST-LA-9-01 and SD-AB-0-01	18		THB			48,100.00	865,800.00	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	870,889.68	870,889.68		
				<b>THB</b>	<b>7,843,096.80</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB4</b>							<b>865,800.00</b>		<b>870,889.68</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB5 : Current Transformer and Junction Box**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB5-1	22 kV CT, 150 kV BIL, 2000/4000/6000:1//1//1A, 13 kA, oil filled as per Rating and Features RF CT27B1	6		THB	154,511.50	927,069.00			XXXXX	XXXXX		
1AB5-2	Junction Box type CT7 ( for Item No. 1AB5-1 ) as per Dwg. No. TP-E-18.2 and TP-E-18.4	2		THB			50,666.00	101,332.00	XXXXX	XXXXX		
1AB5-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB5-1 thru 1AB5-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	102,840.10	102,840.10		
				<b>THB</b>	<b>927,069.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB5</b>							<b>101,332.00</b>		<b>102,840.10</b>			

  
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 02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

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

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB6-1	525 kV CCVT, 1550 kV BIL, 287500:115/63.9&115/63.9&115/63.9 V with carrier accessories, oil filled as per Ratings and Features RF PD9W11	12		THB	691,309.30	8,295,711.60			XXXXX	XXXXX		
1AB6-2	525 kV CCVT, 1550 kV BIL, 287500:115/63.9&115/63.9&115/63.9 V without carrier accessories, oil filled as per Ratings and Features RF PD9011	2		THB	691,309.30	1,382,618.60			XXXXX	XXXXX		
1AB6-3	22 kV VT, 150 kV BIL, 22000/ $\sqrt{3}$ : 110/ $\sqrt{3}$ &110/ $\sqrt{3}$ Voil filled as per Ratings and Features RF VT 2012	6		THB			81,539.70	489,238.20	XXXXX	XXXXX		
1AB6-4	Steel Supporting Structure for PD9W11 ( for Item 1AB6-1 ) H=9.00 m. as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	12		THB			48,504.00	582,048.00	XXXXX	XXXXX		
1AB6-5	Steel Supporting Structure for PD9011 ( for Item 1AB6-2 ) H=9.00 m. as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	2		THB			48,504.00	97,008.00	XXXXX	XXXXX		

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02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

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

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB6-6	Junction Box type PT7 ( for Item 1AB6-1 ) as per Dwg. No. TP-E-18.1-3/4, TP-E-18.4 and TP-E-18.5	4		THB			40,308.40	161,233.60	XXXXX	XXXXX		
1AB6-7	Junction Box type PT8 ( for Item 1AB6-2 ) as per Dwg. No. TP-E-18.1-3/4, TP-E-18.4 and TP-E-18.5	2		THB			18,114.80	36,229.60	XXXXX	XXXXX		
1AB6-8	Junction Box type PT6 ( for Item 1AB6-3 ) as per Dwg. No. TP-E-18.1-2/4, TP-E-18.1-3/4 and TP-E-18.4	2		THB			29,360.10	58,720.20	XXXXX	XXXXX		
1AB6-9	Cost of Local Transportation, Construction and Installation for Item No. 1AB6-1 thru 1AB6-8	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,110,280.78	1,110,280.78		
				<b>THB</b>			<b>9,678,330.20</b>	<b>Baht</b>				
<b>Total Price for Schedule 1AB6</b>								<b>1,424,477.60</b>	<b>Baht 1,110,280.78</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB7-1	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02 (LINE NO.1 TO WANG NOI & LINE NO.2 TO UBON RATCHATHANI 3)	1		THB	181,588,023.00	181,588,023.00			XXXXXX	XXXXXX		
1AB7-2	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02 (LINE NO.2 TO WANG NOI & LINE NO.1 TO UBON RATCHATHANI 3)	1		THB	181,588,023.00	181,588,023.00			XXXXXX	XXXXXX		
1AB7-3	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02 (LINE NO.2 TO CHAIYAPHUM 2 & KT1A)	1		THB	181,588,023.00	181,588,023.00			XXXXXX	XXXXXX		
1AB7-4	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02 (LINE NO.1 TO CHAIYAPHUM 2 & KT2A)	1		THB	181,588,023.00	181,588,023.00			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation ( excluding VAT ) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB7-5	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included			XXXXXX	XXXXXX		
1AB7-6	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) outdoor type (GIB) as per DWG. No. NR4-S-1-01/03, NR4-S-1-02/03, NR4-S-2-01/01 and TYP1A-S-3-01/02	1	lot	THB	included	included			XXXXXX	XXXXXX		
1AB7-7	Local control cubicle for IS9450 for item 1AB7-1 thru 1AB7-6*	12		THB	included	included			XXXXXX	XXXXXX		
1AB7-8	Steel Supporting Structure for IS9450*	1	lot	THB	included	included			XXXXXX	XXXXXX		
1AB7-9	Removable service platform and removable ladder for GIS inspection*	1	lot	THB	included	included			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-10	Cost of Local Transportation, Construction and Installation for Item No. 1AB7-1 thru 1AB7-9	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	72,635,209.20	72,635,209.20		
	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.											
<b>Total Price for Schedule 1AB7</b>				<b>THB</b>	<b>726,352,092.00</b>		<b>Baht</b>	<b>72,635,209.20</b>				

\* The design of these equipment/devices shall be verified by Gas Insulated Switchgear manufacturer.

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**


**1AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB9-1	550 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 550 kV 110 Mvar Y-connected five-limbed core type shunt reactor with 110 kV 2.18 Mvar neutral reactor with earthed neutral )	4		THB	6,555,038.60	26,220,154.40			XXXXX	XXXXX		
1AB9-2	Circuit breaker marshalling KIOSK for Item No. 1AB9-1 (Designed by Contractor)	4					664,470.40	2,657,881.60	XXXXX	XXXXX		
1AB9-3	Steel Supporting Structure for CB995R(IEC)* for Item No. 1AB9-1	4		THB	132,497.00	529,988.00			XXXXX	XXXXX		
1AB9-4	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with four Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 1AB9-1	1					4,216,041.50	4,216,041.50	XXXXX	XXXXX		
1AB9-5	Cost of Local Transportation, Construction and Installation for Item No. 1AB9-1 thru 1AB9-4	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,362,406.55	3,362,406.55		
<b>Total Price for Schedule 1AB9</b>				THB	<b>26,750,142.40</b>		<b>Baht</b>		<b>Baht</b>			
								<b>6,873,923.10</b>		<b>3,362,406.55</b>		

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

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB10 : Disconnecting Switch**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB10-1	550 kV 4000 A air switch with grounding blade (high creepage) motor operated as per Ratings and Features RF DS99KI(IEC) (phase spacing = 7.50 m.)	4		THB	2,540,321.30	10,161,285.20			XXXXX	XXXXX		
1AB10-2	Steel Supporting Structure for DS99KI(IEC) as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m. (The structure shall have three phases per set and shall be suitable for connecting with an earth fixed point (Item no. 1AB22-5) on the opposite side of grounding blade)	4					258,689.00	1,034,756.00	XXXXX	XXXXX		
1AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB10-1 thru 1AB10-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,119,604.12	1,119,604.12		
<b>Total Price for Schedule 1AB10</b>				THB	<b>10,161,285.20</b>		Baht		<b>1,119,604.12</b>			
							<b>1,034,756.00</b>		<b>1,119,604.12</b>			

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02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB11 : Power Fuse, Fuse Link and Hook Stick**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB11-1	22 kV 100 A 12.5 kA 1-pole dropout fuse as per Ratings and Features RF PF2111 (Not including fuse link or refill unit)	6		THB	201,654.20	1,209,925.20			XXXXX	XXXXX		
1AB11-2	Fuse link or refill unit 20E for 22 kV power fuse (standard speed)	6		THB	17,941.00	107,646.00			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	131,757.12	131,757.12		
				THB	<b>1,317,571.20</b>		Baht		Baht			
<b>Total Price for Schedule 1AB11</b>									<b>131,757.12</b>			

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-1	400/230 Vac Load Center Unit Substation (LCUS) as per Dwg. No. SE-LCUS-0-01 and TYP1A-L-5-01-01 (Designed by contractor)	1					1,438,300.60	1,438,300.60	XXXXX	XXXXX		
1AB12-2	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					130,342.30	130,342.30	XXXXX	XXXXX		
1AB12-3	Safety switch 600 Vac 800 A, 4 wire, S/N, 3 blades, 3 fuses time lag type, outdoor enclosure (Galvannealed steel or painted stainless steel, IP43, at least 2 mm thickness) completed with 800 A fuses. The terminal lug shall be suitable for ; - Incoming cable size : 2(3-1/C x 240 Sq.mm) Power Cable (Copper). 1(1-1/C x 240 Sq.mm) Power Cable (Copper) for Neutral. - Outgoing cable size : 2(3-1/C x 240 Sq.mm) Power Cable (Copper). 1(1-1/C x 240 Sq.mm) Power Cable (Copper) for Neutral.	2					443,511.20	887,022.40	XXXXX	XXXXX		
1AB12-4	Termination Box type TB1 as per Dwg No. LT-TB-0-01	12					6,628.97	79,547.64	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-5	Outdoor Receptacle Box type ORB1 as per Dwg. No. SE-ORB-0-01(for oil separator)	2					54,809.33	109,618.66	XXXXX	XXXXX		
1AB12-6	Outdoor Receptacle Box type ORB2 as per Dwg. No. SE-ORB-0-01(for general purpose)	3					75,473.93	226,421.79	XXXXX	XXXXX		
1AB12-7	Common cubicle for maintenance type 1 as per Dwg. No. SE-CCM-0-01	1					73,453.60	73,453.60	XXXXX	XXXXX		
1AB12-8	Molded Case Selector Switch 125Vdc as per DWG. SE-MSS-0-01 REV. 0 (FOR INFORMATION)	1					112,433.20	112,433.20	XXXXX	XXXXX		
1AB12-9	22kV 100A 12.5kA Load break switch with Cable Termination as per Ratings and Features RF LB2110 Manually operate, 3 phase, outdoor type with cable termination suitable for - Incoming cable size of 3x35 sq.mm, 22 kV XLPE Power Cable as per Rating and Features RF PC2110, 1 hole NEMA Pad - Outgoing cable size of 3x35 sq.mm, 22 kV XLPE Power Cable as per Rating and Features RF PC2110, 1 hole NEMA Pad	2					646,385.30	1,292,770.60	XXXXX	XXXXX		

**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-10	Power Box (PRB-1 Type I) as per Dwg. No.LT-EQ-0-01 For INCOMING : L - 3-1x1C 240 sq.mm. NYY, N - 1x1C 240 sq.mm. NYY For OUTGOING : L - 4-1x1C 240 sq.mm. NYY, N - 1x1C 240 sq.mm. NYY	1					94,339.33	94,339.33	XXXXX	XXXXX		
1AB12-11	Power Box (PRB-2 ) as per Dwg. No.LT-EQ-0-01 For INCOMING : L - 2(1-1/C x 240 sq.mm.) NYY, N - 1-1/C x 240 sq.mm. NYY For OUTGOING : L - 2(1-1/C x 6 sq.mm.) NYY, N - 2(1-1/C x 6 sq.mm.) NYY	1					94,339.33	94,339.33	XXXXX	XXXXX		
1AB12-12	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For Control Building designed by Contractor)	1					251,023.30	251,023.30	XXXXX	XXXXX		
1AB12-13	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Building, designed by Contractor)	1					251,023.30	251,023.30	XXXXX	XXXXX		
1AB12-14	125 Vdc Power Panel as per Dwg. No. TP-E-4.4 (For Control Building, designed by Contractor)	2					529,984.03	1,059,968.06	XXXXX	XXXXX		

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02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB12-15	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For Control Building, designed by Contractor)	2					174,868.10	349,736.20	XXXXX	XXXXX		
1AB12-16	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Building, designed by Contractor)	2					174,868.10	349,736.20	XXXXX	XXXXX		
1AB12-17	Cost of Local Transportation, Construction and Installation for Item No. 1AB12-1 thru 1AB12-16	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	680,007.65	680,007.65		
<b>Total Price for Schedule 1AB12</b>									<b>Baht 6,800,076.51</b>	<b>Baht 680,007.65</b>		

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filename : TIEC-S-06-1 (500 kV NR4)

02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB13 : Stationary Battery and Battery Charger**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (for 500 kV Substation) (Designed by Contractor, not less than 1600 Ah / Set)											
1AB13-1a	a) Battery	2	set	THB	3,246,378.30	6,492,756.60			XXXXX	XXXXX		
1AB13-1b	b) Electrolyte	2	set	THB	57,278.10	114,556.20			XXXXX	XXXXX		
1AB13-1c	c) Battery Rack	2	set	THB	117,161.00	234,322.00			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	3					965,179.60	2,895,538.80	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	973,717.36	973,717.36		
<b>Total Price for Schedule 1AB13</b>				<b>THB</b>	<b>6,841,634.80</b>		<b>Baht</b>		<b>Baht</b>			
								<b>2,895,538.80</b>		<b>973,717.36</b>		

## MEDIUM COST FOR BID NO. TIEC-S-06

## 1AB14 : Substation Steel Structure

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

## TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-1	500 kV take-off structure (B1) as per Dwg. No. ST-1-01/01, H = 35.00 m (Designed by contractor)	8					1,513,653.00	12,109,224.00	XXXXX	XXXXX		
1AB14-2	500 kV transformer structure column (ST-2) as per Dwg. No. WN-ST-2, H = 21.00 m (Designed by contractor)	8					358,122.00	2,864,976.00	XXXXX	XXXXX		
1AB14-3	500 kV beam (B1-2) as per Dwg. No. ST-1-01/01, H = 28.00 m (Designed by contractor)	6					1,653,103.00	9,918,618.00	XXXXX	XXXXX		
1AB14-4	500 kV transformer structure beam (B2-2) as per Dwg. No. WN-ST-2, H = 10.00 m (Designed by contractor)	6					113,176.00	679,056.00	XXXXX	XXXXX		
1AB14-5	500 kV bus pole structure (BP901) as per Dwg. No. ST-BP-9-01	4					76,176.00	304,704.00	XXXXX	XXXXX		
1AB14-6	22 kV bus pole structure (BP203) as per Dwg. No. ST-BP-2-02	4					20,978.00	83,912.00	XXXXX	XXXXX		
1AB14-7	22 kV bus support structure (BS203) as per Dwg. No. ST-BS-2-03 (Designed by contractor, see detail in scope of work)	4					68,310.00	273,240.00	XXXXX	XXXXX		
1AB14-8	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	12					10,105.00	121,260.00	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-9	Metering structure (MS402) as per Dwg. No. ST-MS-4-02 (01/02-02/02) (Designed by contractor, see detail in scope of work)	2					662,263.00	1,324,526.00	XXXXX	XXXXX		
1AB14-10	Telecommunication Tower Type WSA (H = 30.00 m) as per Dwg. No. UWC-06-WSA-501,502,503&504	1					420,369.00	420,369.00	XXXXX	XXXXX		
1AB14-11	Neutral bus support structure single type (NS201) as per Dwg. No. UA-03-ST447-1B1-9	8					1,374.00	10,992.00	XXXXX	XXXXX		
1AB14-12	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	3					8,892.00	26,676.00	XXXXX	XXXXX		
1AB14-13	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	7					6,871.00	48,097.00	XXXXX	XXXXX		
1AB14-14	Cost of Local Transportation, Construction and Installation for Item No. 1AB14-1 thru 1AB14-13	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	7,046,412.50	7,046,412.50	
<b>Total Price for Schedule 1AB14</b>								<b>Baht</b>	<b>Baht</b>	<b>28,185,650.00</b>	<b>7,046,412.50</b>	

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB15 : Insulator**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB15-1	Suspension insulator fog type (17" minimum leakage distance and 36,000 lb minimum combined M&E strength) as per Specification attached. (For 500kV insulator assembly, 28 units per string consisting of 26 brown-glazed discs and 2 light gray-glazed discs)	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB15-2	500 kV station post insulator ANSI TR. No. 391, high creepage distance of not less than 13,750 mm. as per Specification attached	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB15-3	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	XXXXXX	XXXXXX		
1AB15-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB15-1 thru 1AB15-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	162,341.30	162,341.30		
<b>Total Price for Schedule 1AB15</b>							<b>Baht</b>		<b>Baht</b> <b>162,341.30</b>			

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB16 : Cable Terminations**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB16-1	22 kV cable terminations for 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF TN212H	6		THB	7,617.50	45,705.00			XXXXX	XXXXX		
1AB16-2	Cable Cleats with necessary miscellaneous hardware for Item No. 1AB17-1 TREFOIL formation 3-phase set (Design by Contractor) as per Ratings and Features RF TNAC1	Lump sum	Lump sum	THB	191,400.00	191,400.00			XXXXX	XXXXX		
1AB16-3	Cable Cleats with necessary miscellaneous hardware for Item No. 1AB17-1 flat formation (Design by Contractor) as per Ratings and Feature RF TNAC1	Lump sum	Lump sum	THB	4,342.80	4,342.80			XXXXX	XXXXX		
1AB16-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB16-1 and 1AB16-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	60,361.95	60,361.95		
<b>Total Price for Schedule 1AB16</b>				<b>THB</b>	<b>241,447.80</b>		<b>Baht</b>		<b>Baht 60,361.95</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB17 : XLPE Power Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB17-1	22 kV 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF PC2110	Lump sum	Lump sum				475,200.00	475,200.00	XXXXX	XXXXX		
1AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB17-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	118,800.00	118,800.00		
<b>Total Price for Schedule 1AB17</b>								<b>Baht</b> 475,200.00	<b>Baht</b> 118,800.00			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB18 : Low Voltage Cable and Conductor**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				16,879,896.00	16,879,896.00	XXXXX	XXXXX		
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				64,179,764.00	64,179,764.00	XXXXX	XXXXX		
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				20,900.00	20,900.00	XXXXX	XXXXX		
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				3,488,980.00	3,488,980.00	XXXXX	XXXXX		
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				17,084,241.90	17,084,241.90	XXXXX	XXXXX		
1AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				629,059.20	629,059.20	XXXXX	XXXXX		
1AB18-7	Cost of Local Transportation, Construction and Installation for Item No. 1AB18-1 thru 1AB18-6	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	25,570,710.28	25,570,710.28	
<b>Total Price for Schedule 1AB18</b>							<b>Baht</b>	<b>102,282,841.10</b>	<b>Baht</b>	<b>25,570,710.28</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB19 : Switchyard Lighting Fixtures**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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					10,568.80	253,651.20	XXXXX	XXXXX
1AB19-2	Solar lighting fixture for fence and access road, LED, All in one type as per Ratings and Features RF LX01L1 and Dwg. No. LT-FX-0-03	47					13,390.30	629,344.10	XXXXX	XXXXX
1AB19-3	Tapered galvanized steel lamp post H = 4500 mm. complete with anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	47					19,729.60	927,291.20	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	452,571.63	452,571.63
<b>Total Price for Schedule 1AB19</b>							<b>Baht 1,810,286.50</b>		<b>Baht 452,571.63</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB20-1	Aluminum tube as per Specification attached	Lump sum	Lump sum				255,539.90	255,539.90	XXXXX	XXXXX		
1AB20-2	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	637,942.80	637,942.80			XXXXX	XXXXX		
1AB20-3	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	197,102.40	197,102.40			XXXXX	XXXXX		
1AB20-4	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				20,776.80	20,776.80	XXXXX	XXXXX		
1AB20-5	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				137,583.60	137,583.60	XXXXX	XXXXX		
1AB20-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB20-1 thru 1AB20-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	312,236.38	312,236.38		
<b>Total Price for Schedule 1AB20</b>					<b>THB</b>	<b>835,045.20</b>	<b>Baht</b>	<b>413,900.30</b>	<b>Baht</b>	<b>312,236.38</b>		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	2,419,124.40	2,419,124.40			XXXXX	XXXXX		
1AB21-2	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	426,244.50	426,244.50			XXXXX	XXXXX		
1AB21-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB21-1 thru 1AB21-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	711,342.23	711,342.23		
				<b>THB</b>	<b>2,845,368.90</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB21</b>									<b>711,342.23</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	241,223.40	241,223.40			XXXXX	XXXXX		
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				2,275,979.20	2,275,979.20	XXXXX	XXXXX		
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	1,365,014.20	1,365,014.20			XXXXX	XXXXX		
1AB22-4	Disconnecting switch safety Mats	12		THB	14,864.30	178,371.60			XXXXX	XXXXX		
1AB22-5	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	637,897.70	637,897.70			XXXXX	XXXXX		
1AB22-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB22-1 thru 1AB22-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,174,621.53	1,174,621.53		
<b>Total Price for Schedule 1AB22</b>				<b>THB</b>	<b>2,422,506.90</b>		<b>Baht</b>	<b>2,275,979.20</b>		<b>Baht</b>	<b>1,174,621.53</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum					304,484.40	304,484.40	XXXXX	XXXXX	
1AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	226,404.20	226,404.20				XXXXX	XXXXX	
1AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum					79,800.00	79,800.00	XXXXX	XXXXX	
1AB23-4	Heat shrinkable insulation material as per Specification attached	Lump sum	Lump sum	THB	87,374.10	87,374.10				XXXXX	XXXXX	
1AB23-5	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum					232,000.00	232,000.00	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	232,515.68	232,515.68	
<b>Total Price for Schedule 1AB23</b>					<b>THB</b>	<b>313,778.30</b>	<b>Baht</b>		<b>616,284.40</b>	<b>Baht</b>	<b>232,515.68</b>	

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MEDIUM COST FOR BID NO. TIEC-S-06

1AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
IAB24-1	500 KV BUS PROTECTION (LOW IMPEDANCE, 8 FEEDERS)	Panel Nos. 1R, 2R, 3R and 4R To be Installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	4	SET			1,391,103.00	5,564,412.00	XXXXXX	XXXXXX			
IAB24-2	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos. 5R, 8R, 11R and 18R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	4	EA			1,678,975.00	6,715,900.00	XXXXXX	XXXXXX			
IAB24-3	500 kV LINE PROTECTION (21P, 59L, 2-BF)	Panel Nos. 6R and 9R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	2	EA			2,046,998.00	4,093,996.00	XXXXXX	XXXXXX			

  
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1AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-4	500 kV LINE PROTECTION (21P, 59L, 2-BF)	Panel Nos. 12R and 19R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	2	EA			2,103,188.00	4,206,376.00	XXXXX	XXXXX			
1AB24-5	500 kV SHUNT REACTOR PROTECTION	Panel Nos. 7R, 10R, 13R and 20R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	4	EA			1,280,687.00	5,122,748.00	XXXXX	XXXXX			
1AB24-6	500/230 kV TRANSFORMER PROTECTION (5 RESTRAINS, 1-BF)	Panel Nos. 14R and 16R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	2	EA			1,123,555.00	2,247,110.00	XXXXX	XXXXX			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-7	500/230 kV TRANSFORMER PROTECTION (5 RESTRAINS, 4-51, 24K, 59)	Panel Nos. 15R and 17R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	2	EA			1,871,899.00	3,743,798.00	XXXXXX	XXXXXX			
1AB24-8	500 kV TRIP CIRCUIT SUPERVISION (6-BKR)	Panel Nos. 21R, 22R and 23R to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	3	EA			737,146.00	2,211,438.00	XXXXXX	XXXXXX			

  
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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-9	MARSHALLING PANEL FOR TELEPROTECTION (500 kV)	Panel Nos. MP-TELE1 to be installed at 500/230 kV Control Building. Specification No. 1005. Drawing Nos.NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and DW-TPS-D01-115-01 P.1-6. Scope of work.	1	EA			377,790.00	377,790.00	XXXXX	XXXXX			
1AB24-10	MARSHALLING PANEL FOR RTU	Panel Nos. MP-RTU1, MP-RTU2 and MP-RTU3 to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.3. Scope of work.	3	EA			344,331.00	1,032,993.00	XXXXX	XXXXX			

  
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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price ( excluding VAT ) Baht		( excluding VAT ) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
IAB24-11	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel Nos. MPC1 and MPC2 to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.3. Scope of work.	2	EA				340,597.00	681,194.00	XXXXX	XXXXX		
IAB24-12	MARSHALLING PANEL FOR FRS	Panel Nos. MP-FRS1 to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.3. Scope of work.	1	EA				352,081.00	352,081.00	XXXXX	XXXXX		

  
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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price ( excluding VAT ) Baht		( excluding VAT ) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-13	TRANSDUCER PANEL	Panel No.TDR1 including 8-V TDR 1ph. 2-A TDR 1ph. 6-TS. 6-W&VAR TDR. 1-DC TDR(48VDC). 7-T TDR. 6-R TDR. 1-27VTR. 2-F TDR. to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.2. Scope of work.	1	EA					1,841,739.00	1,841,739.00	XXXXX	XXXXX	

  
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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-14	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel Nos.S1 to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.1. Scope of work.	1	EA			512,463.00	512,463.00	XXXXX	XXXXX			
1AB24-15	GPS RECEIVER PANEL	Panel Nos.GPS1 to be installed at 500/230 kV Control Building. Including Set of GPS Receiver, GPS Antena, Ethernet Switch and Accessories (Port of Ethernet Switch shall not be less than 192 port) Specification No. 1005 DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.15. Scope of work.	1	EA			3,234,480.00	3,234,480.00	XXXXX	XXXXX			

  
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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB24-16	INTERPOSING PANEL TYPE IP7	Panel Nos.IP1 and IP2 to be installed at 500/230 kV Control Building. Specification No. 1005. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.2. Scope of work.	2	EA			942,518.00	1,885,036.00	XXXXXX	XXXXXX			
1AB24-17	Cost of Local Transportation, Construction and Installation for Item Nos. 1AB24-1 thru 1AB24-16		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	4,540,381.00	4,540,381.00		
<b>Total Price for Schedule 1AB24</b>								<b>Baht</b>	<b>43,823,554.00</b>	<b>Baht</b>	<b>4,540,381.00</b>		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

1AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
IAB25-1	FAULT RECORDING SYSTEM, 96 ANALOG INPUT, 480 DIGITAL INPUT.	To be Installed at 500/230 kV Control Building. Specification No. 1003. DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2 and TP-E-10.2. Scope of work.	1	SET			4,536,422.00	4,536,422.00	XXXXXX	XXXXXX			
IAB25-2	Cost of Local Transportation, Construction and Installation for Item No.1AB25-1		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	476,302.00	476,302.00		
<b>Total Price for Schedule 1AB25</b>								<b>Baht</b>	<b>4,536,422.00</b>	<b>Baht</b>	<b>476,302.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB38 : Remote Terminal Unit**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
1AB38-1	DESIGN AND INSTALLATION OF EGAT'S APPLICATION SOFTWARE	DWG. Nos. NR4-E-1.1 sh.1-2, NR4-E-2.1 sh.1-2, NR4-E-3.1 sh.1-2. Scope of work.	1	SET		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB38-2	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	Installed in 500kV Control building. Scope of work.	1	SET		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB38-3	EGAT RTU TYPE 621M	Installed in 500kV Control building. Scope of work.	1	EA		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB38-4	EGAT RTU TYPE 621	Installed in 500kV Control building. Scope of work.	1	EA		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
1AB38-5	EGAT RTU TYPE 16D	Installed in 500kV Control building. Scope of work.	2	EA		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

1AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB38-6	Cost of Local Transportation, Construction and Installation for Item No.1AB38-1 thru 1AB38-5		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	996,245.00	996,245.00		
<b>Total Price for Schedule 1AB38</b>									<b>Baht</b>	<b>Baht</b>	<b>996,245.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	1,400,000.00	1,400,000.00		
							<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB39</b>									<b>1,400,000.00</b>			

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## 1C1 : Foundation Work

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-1	500 kV Take off structure foundation ( TS901 ) pile type	FD-TS-9-02	8	set	902,469.00	7,219,752.00
1C1-2	500 kV Take off with fire wall foundation (ST-2)	FD-FW-9-02	8	set	583,100.00	4,664,800.00
1C1-3	Transformer Foundation (T-200) Pile Type	FD-TX-8-02	6	set	185,279.00	1,111,674.00
1C1-4	500 kV Shunt reactor foundation (SR901) pile type	FD-SR-9-02	4	set	160,689.00	642,756.00
1C1-5	500 kV Neutral reactor foundation ( NR901 ) pile type	FD-NR-9-02	4	set	37,595.00	150,380.00
1C1-6	500 kV Power circuit breaker foundation ( CB901 ) pile type	FD-CB-9-02	12	set	44,780.00	537,360.00
1C1-7	500kV General equipment support structure foundation (CT901,VT901,LA901,BP901,BP902) pile type (LA901 only)	FD-GE-9-02	18	set	52,285.00	941,130.00
1C1-8	500kV General equipment support structure foundation (CT901,VT901,LA901,BP901,BP902) pile type (VT901 only)	FD-GE-9-02	14	set	52,285.00	731,990.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-9	500 kV Disconnecting switch foundation ( DS901 ) pile type	FD-DS-9-02	12	set	54,438.00	653,256.00
1C1-10	500kV General equipment support structure foundation (CT901,VT901,LA901,BP901,BP902) pile type (BP901 only)	FD-GE-9-02	4	set	52,769.00	211,076.00
1C1-11	500 kV GIB Air bushing support structure foundation (GBS901) pile type	FD-GBS-9-01	24	set	39,103.00	938,472.00
1C1-12	500 kV GIB support structure foundation ( Pile type ) (GIB901)	Designed by contractor RE2-GIB-9-01 See scope of work	Lump sum	Lump sum	2,715,088.00	2,715,088.00
1C1-13	22 kV Bus pole support structure foundation (BP 201, BP202, BP203) Pile Type (BP203 only)	FD-BP-2-02	4	set	4,739.00	18,956.00
1C1-14	22 kV Bus support structure foundation (BS201,BS202,BS203,BS204) Pile Type (BS203 only)	FD-BS-2-02	4	set	14,410.00	57,640.00
1C1-15	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02	12	set	2,514.00	30,168.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-16	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03	3	set	7,538.00	22,614.00
1C1-17	Junction Box Structure foundation (JB003) Pile Type	FD-JB-0-06	7	set	4,347.00	30,429.00
1C1-18	Circuit breaker marshalling kiosk foundation ( MK ) pad type	Designed by contractor MM3-MK-9-01 See scope of work	4	set	2,780.00	11,120.00
1C1-19	Common control cubicle foundation (CCC) pad type	Designed by contractor ABB/PDG-CCC-9-01 See scope of work	2	set	21,293.00	42,586.00
1C1-20	22&33 kV Distribution Transformer foundation (DX402) Pad Type	FD-DX-4-01	2	set	10,466.00	20,932.00
1C1-21	Load break switch structure foundation (LBS)	Designed by contractor MTG-LBS-0-01 See scope of work	2	set	26,620.00	53,240.00
1C1-22	Lighting Relay Panel foundation (RP002) Pile Type	FD-RP-0-02	1	set	5,549.00	5,549.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-23	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type	FD-LP-0-05	47	set	9,511.00	447,017.00
1C1-24	Telecommunication tower foundation (WSA) pile type	FD-TT-0-08	1	set	110,799.00	110,799.00
1C1-25	22&33 kV Metering Structure foundation (MS402) Pile Type	FD-MS-4-04	2	set	17,999.00	35,998.00
1C1-26	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	12,591,030.00	12,591,030.00
<b>Total Price for Schedule 1C1</b>					<b>Baht 33,995,812.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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, NR4-C-3	Lump sum	Lump sum	5,981,062.00	5,981,062.00
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02, NR4-C-3	Lump sum	Lump sum	106,658.00	106,658.00
1C2-3	Cable trench, steel cover included (Type"A")	Designed by contractor SD-CE-0-02, NR4-C-3 See Scope of work	Lump sum	Lump sum	4,973,473.00	4,973,473.00
1C2-4	Cable trench, steel cover included (Type"B")	Designed by contractor SD-CE-0-02, NR4-C-3 See Scope of work	Lump sum	Lump sum	143,353.00	143,353.00
1C2-5	Reinforcement of standard handhole	SD-HH-0-01	26	set	8,607.00	223,782.00
<b>Total Price for Schedule 1C2</b>					<b>Baht 11,428,328.00</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-1	500kV GIS Building	Designed by contractor SD-GIS-9-02A, SD-GIS-9-02L, SD-GIS-9-02M See scope of work	Lump sum	Lump sum	193,557,153.00	193,557,153.00
1C3-1.1	Ventilation system	-	Lump sum	Lump sum	Included in 1C3-1	Included in 1C3-1
1C3-1.2	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	10,606,365.00	10,606,365.00
1C3-2	500 kV Control Building	SD-CD-0-01C, SD-CD-0-01A, SD-CD-0-01L, SD-CD-0-01M, SD-CD-0-01ME, SD-CD-0-01SN, SD-CD-0-01FP	Lump sum	Lump sum	35,346,096.00	35,346,096.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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	26,728.97	26,728.97
1C3-2.1.2	Minimum 36,000 BTU split-type air conditioner, including installation fee ( Not Higher than the price specified by the Bureau of the Budget www.bb.go.th )	-	1	set	42,523.36	42,523.36
1C3-2.1.3	Minimum 48,000 BTU split-type air conditioner (Invertor), including installation fee ( Not Higher than the price specified by the Bureau of the Budget www.bb.go.th )	-	22	set	56,915.89	1,252,149.58
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	67,422.62	134,845.24

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	1,324,710.00	1,324,710.00
1C3-2.3	Solar rooftop system	-	Lump sum	Lump sum	2,520,000.00	2,520,000.00
<b>Total Price for Schedule 1C3</b>					<b>Baht 244,810,571.15</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C4 : Earth Work, Road and Crushed Rock Surfacing**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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, NR4-C-6	Lump sum	Lump sum	6,598,739.00	6,598,739.00
1C4-2	Transformer loading	SD-RD-0-03, NR4-C-6	Lump sum	Lump sum	1,066,009.00	1,066,009.00
1C4-3	Crushed rock surfacing 0.10 m thickness	NR4-C-1	Lump sum	Lump sum	4,191,908.00	4,191,908.00
<b>Total Price for Schedule 1C4</b>					<b>Baht</b>	<b>11,856,656.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C5 : Water Supply System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C5-1	Laying of water supply : HDPE. pipe (PN10) with valve & fittings	Designed by contractor See Dwg No. NR4-C-9 See scope of work	Lump sum	Lump sum	49,678.00	49,678.00
1C5-2	Laying of water supply : Galvanized steel pipe (ClassB) with valve & fittings	Designed by contractor See Dwg No. NR4-C-9 See scope of work	Lump sum	Lump sum	39,108.00	39,108.00
<b>Total Price for Schedule 1C5</b>					<b>Baht</b>	<b>88,786.00</b>

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## 1C6 : Drainage System

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C6-1	Oil separator (Pile type)	SD-OS-0-02	2	set	1,760,997.00	3,521,994.00
1C6-2	Drainage System	Designed by Contractor See Dwg No.NR4-C-6 See Scope of work	Lump sum	Lump sum	12,446,374.00	12,446,374.00
1C6-3	Dia. 0.50 m Black steel pipe (Spiral-Seam) TIS 427-2562 or lastest edition	WD-DN-0-01	Lump sum	Lump sum	6,347,960.00	6,347,960.00
1C6-4	Oil pit with steel grating	WD-DN-0-04	Lump sum	Lump sum	5,763,967.00	5,763,967.00
1C6-5	Dia. 0.15m PVC. Pipe (Class 8.5)	WD-DN-0-01	Lump sum	Lump sum	15,202.00	15,202.00
<b>Total Price for Schedule 1C6</b>					<b>Baht</b>	<b>28,095,497.00</b>



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## MEDIUM COST FOR BID NO. TIEC-S-06

## 1C7 : Special Construction Works

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C7-1	64 sq.m Site office	See Scope of work	1	set	798,846.00	798,846.00
1C7-2	Architectural,Engineering design work and 3D Animation presentation file	-	Lump sum	Lump sum	12,080,818.00	12,080,818.00
1C7-3	Fire Protection design work	-	Lump sum	Lump sum	775,494.00	775,494.00
1C7-4	Test and commissioning for fire protection system in switchyard	-	Lump sum	Lump sum	120,990.00	120,990.00
1C7-5	Test and commissioning for fire pump system	-	Lump sum	Lump sum	64,665.00	64,665.00
1C7-6	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)	-	10	set	42,500.00	425,000.00
1C7-7	Test and commissioning for GIS Building fire protection system	-	Lump sum	Lump sum	44,036.00	44,036.00



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C7-8	Test and commissioning for inert gas system (Test in Electrical room)	-	Lump sum	Lump sum	70,000.00	70,000.00
1C7-9	Dynamic Pile load test	See Scope of work	Lump sum	Lump sum	709,080.00	709,080.00
1C7-10	Static pile load test	See Scope of work	1	set	179,589.00	179,589.00
<b>Total Price for Schedule 1C7</b>					<b>Baht</b>	<b>15,268,518.00</b>

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## 1C8 : Miscellaneous

## SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-1	Sub-soil investigation including field and laboratory tests (according to Spec.no.3001) (min 10.00m depth)	-	9	set	13,350.00	120,150.00
1C8-2	Wire mesh fence with piling work	SD-CF-0-01	Lump sum	Lump sum	5,050,714.00	5,050,714.00
1C8-3	Switchyard Entrance Gate (sliding gate) with piling work	SD-SG-0-02	1	set	275,170.00	275,170.00
1C8-4	Main entrance gate 8.00m width (sliding) with piling work	SD-SG-0-03	1	set	391,460.00	391,460.00
1C8-5	Standard symbol and sign letters of substation	TP.655A-MS-A-1/1	1	set	418,050.00	418,050.00
1C8-6	Sign Board Structure & foundation with piling work	SD-SB-0-08	1	set	215,757.00	215,757.00
1C8-7	Garage (5.50x12.00m)	HS-PS-0-02	1	set	265,393.00	265,393.00
<b>Total Price for Schedule 1C8</b>					<b>Baht 6,736,694.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-1	Fire Protection System for 500kV Control Building	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	14,392,648.00	14,392,648.00
1C9-2	Fire Protection System for 500kV GIS Building	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	6,191,033.00	6,191,033.00
1C9-3	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04	3	set	233,198.00	699,594.00
1C9-4	Fire pump house with piling work	SD-FPH-8-01	1	set	1,077,534.00	1,077,534.00
1C9-5	Foam house with piling work	SD-FH-8-01	2	set	966,107.00	1,932,214.00
1C9-6	Water storage tank min. capacity 350 cu.m. with piling work	Designed by contractor Dwg no. NR4-C-9 See scope of work	1	set	2,528,999.00	2,528,999.00
1C9-7	Fire pump system	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	5,087,500.00	5,087,500.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C9-8	Fire Protection System for transformer / shunt reactor	Designed by contractor Dwg no. NR4-C-9 See scope of work	10	set	660,126.00	6,601,260.00
1C9-9	Bladder tank proportioning system and components	Designed by contractor Dwg no. NR4-C-9 See scope of work	2	set	1,012,115.00	2,024,230.00
1C9-10	Fire Protection System for switchyard	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	4,839,887.00	4,839,887.00
1C9-11	Fire Protection environmental monitoring system	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	657,965.00	657,965.00
<b>Total Price for Schedule 1C9</b>					<b>Baht 46,032,864.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation ( excluding VAT ) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
1D7-1	Note: detail and breakdown price of each equipment for each item shall be submitted together with tender documents during the bidding Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	39,959.70	39,959.70			XXXXXX	XXXXXX		
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	69,006.30	69,006.30			XXXXXX	XXXXXX		
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	31,183.90	31,183.90			XXXXXX	XXXXXX		
1D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	59,615.60	59,615.60			XXXXXX	XXXXXX		
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	58,325.30	58,325.30			XXXXXX	XXXXXX		
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	258,756.30	258,756.30			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D7-7	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	564,173.50	564,173.50			XXXXX	XXXXX
1D7-8	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)	3	set	THB	137,943.30	413,829.90			XXXXX	XXXXX
1D7-9	Operating Analyzer Fitting Means accessories for GIS (1 EA of Fitting Means/1 set)	3	set	THB	228,661.40	685,984.20			XXXXX	XXXXX
1D7-10	Cost of Local Transportation for Item No. 1D7-1 thru 1D7-9	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	109,041.74	109,041.74
<b>Total Price for Schedule 1D7</b>				<b>THB</b>	<b>2,180,834.70</b>		<b>Baht</b>		<b>Baht</b> <b>109,041.74</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

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

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D11-1	Fuse link or refill unit 20E for 22 kV power fuse	6		THB	17,941.00	107,646.00			XXXXXX	XXXXXX
1D11-2	6.10 m. (20 ft.) hook stick combination operating hook stick and fuse remover, (14 ft universal with male pin and 6 ft pole extention with female pin) for use with the power fuse item no. 1AB11-1	1		THB	33,110.53	33,110.53			XXXXXX	XXXXXX
1D11-3	Cost of Local Transportation for Item No. 1D11-1 thru 1D11-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	7,037.83	7,037.83
				THB	140,756.53		Baht		Baht	
<b>Total Price for Schedule 1D11</b>									<b>7,037.83</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

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

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D12-1	Fuse time lag type 800 A	6				66,826.65	400,959.90	XXXXX	XXXXX	
1D12-2	Cost of Local Transportation for Item No. 1D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	20,048.00	20,048.00
<b>Total Price for Schedule 1D12</b>							<b>Baht</b> 400,959.90	<b>Baht</b> 20,048.00		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**1D22 : Spare Parts for Grounding Material**

**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation			
					Foreign Supply		Local Supply		( excluding VAT ) Baht		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	537,639.30	537,639.30			XXXXX	XXXXX		
1D22-2	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	2	set	THB	964,825.40	1,929,650.80			XXXXX	XXXXX		
1D22-3	Cost of Local Transportation for Item No. 1D22-1 thru 1D22-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	123,364.51	123,364.51		
				<b>THB</b>	<b>2,467,290.10</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1D22</b>									<b>123,364.51</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		Local Transportation ( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-1	BUS DIFFERENTIAL RELAY (Low Impedance- Switching Zone)	Supply as spare part for 8 feeders current rating 1A. Same model type as supplied in item no. 1AB24-1.	1	EA			740,182.00	740,182.00	XXXXXX	XXXXXX	
1D24-2	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply as spare part. Same model type as supplied in item no. 1AB24-2 (Primary Protection).	1	EA			353,291.00	353,291.00	XXXXXX	XXXXXX	
1D24-3	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply as spare part. Same model type as supplied in item no. 1AB24-3 (Secondary Protection).	1	EA			353,291.00	353,291.00	XXXXXX	XXXXXX	
1D24-4	AUTO RECLOSING AND SYNCHRONISM CHECK RELAY (79+25)	Supply as spare part. Same model type as supplied in item no. 1AB24-2.	1	EA			147,759.00	147,759.00	XXXXXX	XXXXXX	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		Local Transportation ( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-5	REACTOR DIFFERENTIAL RELAY (87R)	Supply as spare part. Same model type as supplied in item no. 1AB24-5.	1	EA			267,382.00	267,382.00	XXXXXX	XXXXXX	
1D24-6	NEUTRAL REACTOR DIFFERENTIAL RELAY (87RN)	Supply as spare part. Same model type as supplied in item no. 1AB24-5.	1	EA			267,382.00	267,382.00	XXXXXX	XXXXXX	
1D24-7	TRANSFORMER DIFFERENTIAL RELAY (87K, 5 restraint windings)	Supply as spare part. Same model type as supplied in item no. 1AB24-6 and 1AB24-7.	1	EA			348,408.00	348,408.00	XXXXXX	XXXXXX	
1D24-8	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Supply as spare part. Same model type as supplied in item no. 1AB24-7.	1	EA			114,148.00	114,148.00	XXXXXX	XXXXXX	
1D24-9	OVERCURRENT GROUND BACKUP RELAY (51GB)	Supply as spare part. Same model type as supplied in item no. 1AB24-7.	1	EA			114,148.00	114,148.00	XXXXXX	XXXXXX	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE**  
**SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation			
						Foreign Supply		Local Supply		( excluding VAT ) Baht		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1D24-10	OVERVOLTAGE RELAY (59N,59C)	Supply as spare part. Same model type as supplied in item no. 1AB24-3.	1	EA			186,758.00	186,758.00	XXXXX	XXXXX			
1D24-11	BREAKER FAILURE RELAY (50BF+62BF)	Supply as spare part. Same model type as supplied in item no. 1AB24-3.	1	EA			139,694.00	139,694.00	XXXXX	XXXXX			
1D24-12	Cost of Local Transportation for Item No.1D24-1 thru 1D24-11		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	18,713.00	18,713.00		
<b>Total Price for Schedule 1D24</b>								<b>Baht</b>	<b>3,032,443.00</b>	<b>Baht</b>	<b>18,713.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		Local Transportation ( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D25-1	ANALOG ISOLATOR CARD	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA			78,075.00	78,075.00	XXXXXX	XXXXXX	
1D25-2	POWER SUPPLY	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA			32,301.00	32,301.00	XXXXXX	XXXXXX	
1D25-3	ACQUISITION UNIT	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA			22,954.00	22,954.00	XXXXXX	XXXXXX	
1D25-4	CPU & MEMORY MODULE 1	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA			76,539.00	76,539.00	XXXXXX	XXXXXX	
1D25-5	ANALOG ISOLATOR FOR VOLTAGE	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA			76,539.00	76,539.00	XXXXXX	XXXXXX	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE**  
**SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D25-6	ANALOG ISOLATOR FOR CURRENT	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA				76,539.00	76,539.00	XXXXX	XXXXX
1D25-7	DIGITAL ISOLATOR MODULE	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA				74,435.00	74,435.00	XXXXX	XXXXX
1D25-8	HARD DISK & HARD DISK CONTROLLER	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA				68,885.00	68,885.00	XXXXX	XXXXX
1D25-9	TELE- COMMUNICATION BOARD	Supply as spare part. Same model type as supplied in item no. 1AB25-1.	1	EA				22,954.00	22,954.00	XXXXX	XXXXX

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**1D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 500 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation			
						Foreign Supply		Local Supply		Ex-works Price ( excluding VAT ) Baht		( excluding VAT ) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1D25-10	Cost of Local Transportation for Item No.1D25-1 thru 1D25-9		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	12,141.00	12,141.00		
<b>Total Price for Schedule 1D25</b>									<b>Baht</b>	<b>529,221.00</b>	<b>Baht</b> <b>12,141.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB4 : Surge Arrester**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB4-1	192 kV Surge Arrester as per Ratings and Features RF SA8Y11	6		THB	147,077.70	882,466.20			XXXXX	XXXXX		
2AB4-2	Steel Supporting Structure for SA8Y11 ( for Item No. 2AB4-1 ), H=5.50 m as per Dwg. No. ST-LA-8-01 and SD-AB-0-01	6		THB			28,294.00	169,764.00	XXXXX	XXXXX		
2AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB4-1 thru 2AB4-2	Lumpsum	Lumpsum		XXXXX	XXXXX	XXXXX	XXXXX	105,223.02	105,223.02		
				<b>THB</b>	<b>882,466.20</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 2AB4</b>							<b>169,764.00</b>		<b>105,223.02</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount				
2AB7-1	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and DWG. No. NR4-S-1-03/03, NR4-S-2-01/01 and TYP1A-S-3-02/02 (KT1A and LINE NO. 2 TO STATCOM)	1		THB	101,451,678.00	101,451,678.00			XXXXXX	XXXXXX		
2AB7-2	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and DWG. No. NR4-S-1-03/03, NR4-S-2-01/01 and TYP1A-S-3-02/02 (LINE NO.1 TO STATCOM and LINE NO. 2 TO NAKHON RATCHASIMA 3)	1		THB	101,451,678.00	101,451,678.00			XXXXXX	XXXXXX		
2AB7-3	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and DWG. No. NR4-S-1-03/03, NR4-S-2-01/01 and TYP1A-S-3-02/02 (KT2A and LINE NO.1 TO NAKHON RATCHASIMA 3)	1		THB	101,451,678.00	101,451,678.00			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount				
2AB7-4	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) and DWG. No. NR4-S-1-03/03, NR4-S-2-01/01 and TYP1A-S-3-02/02 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-5	245 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS8450(IEC) outdoor type (GIB) as per DWG. No. NR4-S-1-03/03, NR4-S-2-01/01 and TYP1A-S-3-02/02	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-6	Local control cubicle for IS8450 for item 2AB7-1 thru 2AB7-5*	9		THB	included	included			XXXXX	XXXXX		
2AB7-7	Steel Supporting Structure for IS8450*	1	lot	THB	included	included			XXXXX	XXXXX		
2AB7-8	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. TIEC-S-06**

**2AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB7-9	Cost of Local Transportation, Construction and Installation for Item No. 2AB7-1 thru 2AB7-8	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	30,435,503.40	30,435,503.40		
	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.											
<b>Total Price for Schedule 2AB7</b>				<b>THB</b>	<b>304,355,034.00</b>		<b>Baht</b>		<b>Baht 30,435,503.40</b>			

\* The design of these equipment/devices shall be verified by Gas Insulated Switchgear manufacturer.

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB12-1	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					130,342.30	130,342.30	XXXXX	XXXXX		
2AB12-2	Termination Box type TB1 as per Dwg No. LT-TB-0-01	6					6,628.97	39,773.82	XXXXX	XXXXX		
2AB12-3	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For Control Building, designed by Contractor)	1					251,023.30	251,023.30	XXXXX	XXXXX		
2AB12-4	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Building, designed by Contractor)	1					251,023.30	251,023.30	XXXXX	XXXXX		
2AB12-5	125 Vdc Power Panel as per Dwg. No. TP-E-4.4 (For Control Building, designed by Contractor)	1					529,984.03	529,984.03	XXXXX	XXXXX		
2AB12-6	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For Control Building, designed by Contractor)	1					174,868.10	174,868.10	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB12-7	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Building, designed by Contractor)	1					174,868.10	174,868.10	XXXXX	XXXXX		
2AB12-8	Cost of Local Transportation, Construction and Installation for Item No. 2AB12-1 thru 2AB12-7	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	155,188.30	155,188.30		
<b>Total Price for Schedule 2AB12</b>							<b>Baht 1,551,882.95</b>		<b>Baht 155,188.30</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB13 : Stationary Battery and Battery Charger**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (for 230 kV Substation) (Designed by Contractor, shall be not less than 1600 Ah.)											
2AB13-1a	a) Battery	1	set	THB	3,246,378.30	3,246,378.30			XXXXX	XXXXX		
2AB13-1b	b) Electrolyte	1	set	THB	57,278.10	57,278.10			XXXXX	XXXXX		
2AB13-1c	c) Battery Rack	1	set	THB	117,161.00	117,161.00			XXXXX	XXXXX		
2AB13-2	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. 2AB13-1	2					965,179.60	1,930,359.20	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB13 : Stationary Battery and Battery Charger**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB13-1 thru 2AB13-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	535,117.66	535,117.66		
<b>Total Price for Schedule 2AB13</b>				<b>THB</b>	<b>3,420,817.40</b>		<b>Baht</b>	<b>1,930,359.20</b>		<b>535,117.66</b>		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB14-1	230 kV take-off structure (TS802) as per Dwg. No. ST-TS-8-02	10					367,015.00	3,670,150.00	XXXXX	XXXXX		
2AB14-2	230 kV beam (BB802) as per Dwg. No. ST-BB-8-02	6					141,794.00	850,764.00	XXXXX	XXXXX		
2AB14-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB14-1 thru 2AB14-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,130,228.50	1,130,228.50		
<b>Total Price for Schedule 2AB14</b>								<b>Baht</b>	<b>4,520,914.00</b>	<b>Baht</b>	<b>1,130,228.50</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB15 : Insulator**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB15-1	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		
2AB15-2	230 kV station post insulator ANSI TR. No. 308 as per Specification attached	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX		
2AB15-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB15-1 thru 2AB15-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	71,512.65	71,512.65		
<b>Total Price for Schedule 2AB15</b>										<b>71,512.65</b>		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB18 : Low Voltage Cable and Conductor**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				7,278,700.00	7,278,700.00	XXXXX	XXXXX		
2AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				4,221,690.00	4,221,690.00	XXXXX	XXXXX		
2AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				10,450.00	10,450.00	XXXXX	XXXXX		
2AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				181,500.00	181,500.00	XXXXX	XXXXX		
2AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				5,991,130.20	5,991,130.20	XXXXX	XXXXX		
2AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				997,150.00	997,150.00	XXXXX	XXXXX		
2AB18-7	Overhead ground wire as per Specification attached	Lump sum	Lump sum				17,864.00	17,864.00	XXXXX	XXXXX		
2AB18-8	Cost of Local Transportation, Construction and Installation for Item No. 2AB18-1 thru 2AB18-7	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	4,674,621.05	4,674,621.05	
<b>Total Price for Schedule 2AB18</b>								<b>Baht</b>	<b>18,698,484.20</b>	<b>Baht</b>	<b>4,674,621.05</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB19 : Switchyard Lighting Fixtures**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	12					10,568.80	126,825.60	XXXXX	XXXXX		
2AB19-2	Solar lighting fixture for fence and access road, LED, All in one type as per Ratings and Features RF LX01L1 and Dwg. No. LT-FX-0-03	23					13,390.30	307,976.90	XXXXX	XXXXX		
2AB19-3	Tapered galvanized steel lamp post H = 4500 mm. complete with anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	23					19,729.60	453,780.80	XXXXX	XXXXX		
2AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB19-1 thru 2AB19-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	222,145.83	222,145.83		
<b>Total Price for Schedule 2AB19</b>								<b>Baht</b>	<b>888,583.30</b>	<b>Baht</b>	<b>222,145.83</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB20 : Aluminum Tube, Connector and Miscellaneous Hardware**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB20-1	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				253,519.20	253,519.20	XXXXX	XXXXX		
2AB20-2	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				137,583.60	137,583.60	XXXXX	XXXXX		
2AB20-3	Cost of Local Transportation, Construction and Installation for Item No. 2AB20-1 thru 2AB20-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	97,775.70	97,775.70		
<b>Total Price for Schedule 2AB20</b>								<b>Baht 391,102.80</b>	<b>Baht 97,775.70</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB21-1	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	531,111.90	531,111.90			XXXXX	XXXXX		
2AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	132,777.98	132,777.98		
				<b>THB</b>	<b>531,111.90</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 2AB21</b>									<b>132,777.98</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	64,449.00	64,449.00			XXXXX	XXXXX		
2AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				432,191.10	432,191.10	XXXXX	XXXXX		
2AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	169,593.60	169,593.60			XXXXX	XXXXX		
2AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB22-1 thru 2AB22-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	166,558.43	166,558.43		
				THB	234,042.60		Baht		Baht			
<b>Total Price for Schedule 2AB22</b>							432,191.10		166,558.43			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				52,600.90	52,600.90	XXXXX	XXXXX		
2AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	22,770.00	22,770.00			XXXXX	XXXXX		
2AB23-3	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				53,000.00	53,000.00	XXXXX	XXXXX		
2AB23-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB23-1 thru 2AB23-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	32,092.73	32,092.73		
				<b>THB</b>	<b>22,770.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 2AB23</b>								<b>105,600.90</b>	<b>32,092.73</b>			



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MEDIUM COST FOR BID NO. TIEC-S-06

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-1	230 KV BUS PROTECTION (LOW IMPEDANCE, 8 FEEDERS)	Panel nos. 41R - 44R Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-9.1 and TP-E-10.1 Scope of work	4	SET				1,391,103.00	5,564,412.00	XXXXXX	XXXXXX		
2AB24-2	230 kV LINE PROTECTION (87L, 3ph, 79, 51S)	Panel nos. 45R and 47R Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-9.1 and TP-E-10.1 Scope of work	2	EA				1,207,096.00	2,414,192.00	XXXXXX	XXXXXX		
2AB24-3	230 kV LINE PROTECTION (21P, 3ph, 2-BF, DTT)	Panel nos. 46R and 48R Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-9.1 and TP-E-10.1 Scope of work	2	EA				1,457,460.00	2,914,920.00	XXXXXX	XXXXXX		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-4	230 kV BREAKER FAILURE PROTECTION (3-BF)	Panel no. 49R Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-9.1 and TP-E-10.1 Scope of work	1	EA				1,090,778.00	1,090,778.00	XXXXXX	XXXXXX		
2AB24-5	TRANSDUCER PANEL	Panel no. TDR2 including 2-V TDR (1 phase) 4-V TDR (3 phase) 2-W&VAR TDR 2-TS Drawing nos. NR4-E-1.2 sh.1-2 and TP-E-10.2 Scope of work	1	EA				362,984.00	362,984.00	XXXXXX	XXXXXX		
2AB24-6	INTERPOSING PANEL TYPE IP7	Panel no. IP3 and IP4 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-10.2 and TP-E-6.4 Scope of work	2	EA				942,518.00	1,885,036.00	XXXXXX	XXXXXX		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB24-7	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel no. S2 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2, TP-E-10.1 Scope of work	1	EA				512,463.00	512,463.00	XXXXX	XXXXX		
2AB24-8	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel no. MPC3 and MPC4 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2 and TP-E-10.3 Scope of work	2	EA				340,597.00	681,194.00	XXXXX	XXXXX		
2AB24-9	MARSHALLING PANEL FOR TELEPROTECTION (230 kV General)	Panel no. MP-TELE2 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2, TP-E-10.2, DW-TPS-D01-111-01 sh.P1-P11 and DW-TPS-D01-114-01 sh.P1-P8 Scope of work	1	EA				345,988.00	345,988.00	XXXXX	XXXXX		
2AB24-10	MARSHALLING PANEL FOR FRS	Panel no. MP-FRS2 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2 and TP-E-10.3 Scope of work	1	EA				352,081.00	352,081.00	XXXXX	XXXXX		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB24-11	MARSHALLING PANEL FOR RTU	Panel no. MP-RTU4 and MP-RTU5 Specification No. 1002 Drawing nos. NR4-E-1.2 sh.1-2 and TP-E-10.3 Scope of work	2	EA				344,331.00	688,662.00	XXXXX	XXXXX		
2AB24-12	E1 Converter Panel	Panel no. E1 converter 1 set of multimode optical fiber patch cord cable with at least 30 meters length and 1 set of E1 coaxial cable with at least 10 meters length shall be provided. Specification No. 1002 and SD-FOT-P22 Drawing nos. NR4-E-1.2 sh.1-2, NR4-E-2.2, NR4-E-3.2 and TP-E-10.20 Scope of work	1	EA				419,244.00	419,244.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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
2AB24-13	Cost of Local Transportation, Construction and Installation for Item Nos. 2AB24-1 thru 2AB24-12		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	1,800,674.00	1,800,674.00
<b>Total Price for Schedule 2AB24</b>								<b>Baht</b>		<b>Baht</b>	
								<b>17,231,954.00</b>		<b>1,800,674.00</b>	

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB25-1	FAULT RECORDING SYSTEM, 48 ANALOG INPUT, 144 DIGITAL INPUT.	Panel no. FRS3 Specification No. 1003 Drawing nos. NR4-E-1.2 sh.1-2 and TP-E-10.19 Scope of work	1	SET				2,459,108.00	2,459,108.00	XXXXXX	XXXXXX		
2AB25-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB25-1		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	263,118.00	263,118.00		
<b>Total Price for Schedule 2AB25</b>								<b>Baht 2,459,108.00</b>		<b>Baht 263,118.00</b>			

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB34-1	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 600 Ah (Tubular plate) at 10 Hour rated, 24 Cells, Norminal Voltage 2 Volts/Cell, with Rack 1 set (500/230 kV Control Building at Nakhon Ratchasima4 Substation)	1	SET					363,000.00	363,000.00	XXXXX	XXXXX	
2AB34-2	Conventional Type Charger 48VDC, 150 A (500/230 kV Control Building at Nakhon Ratchasima4 Substation)	2	SET					415,000.00	830,000.00	XXXXX	XXXXX	
2AB34-3	48Vdc. Load Center Type1: 60 Breaker (500/230 kV Control Building at Nakhon Ratchasima4 Substation)	1	SET					143,000.00	143,000.00	XXXXX	XXXXX	
2AB34-4	Local Transportation, Construction and Installation for item 2AB34-1, 2AB34-2 and 2AB34-3	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	101,000.00	101,000.00	
<b>Total Price for Schedule 2AB34</b>								<b>Baht 1,336,000.00</b>		<b>Baht 101,000.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht		
					Foreign Supply		Local Supply		Unit Price	Amount	
					CIF Thai Port		Ex-works Price (excluding VAT) Baht				
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	
2AB35-1	Optical fiber cable from joint box at 500 kV Chaiyaphum2 CCT. 1 take-off structure to fiber frame termination cabinet at 500/230 kV Control Building at Nakhon Ratchasima4 substation										
2AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 300 meters) (b) Rigid steel conduit for optical fiber cable (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 Pigtailes (1.5 meters) (1 set)	1	LOT					123,000.00	123,000.00	XXXXX	XXXXX
2AB35-1.2	Local transportation, Construction and Installation for item 2AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	179,400.00	179,400.00

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB35-2	Optical fiber cable from joint box at 500 kV Wang Noi CCT. 1 take-off structure to fiber frame termination cabinet at 500/230 kV Control Building at Nakhon Ratchasima4 substation											
2AB35-2.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 400 meters) (b) Rigid steel conduit for optical fiber cable (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 meters) (1 set)	1	LOT				121,000.00	121,000.00	XXXXX	XXXXX		
2AB35-2.2	Local transportation, Construction and Installation for item 2AB35-2.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	204,800.00	204,800.00		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB35-3	Optical fiber cable from joint box at 230 kV Nakhon Ratchasima3 CCT. 1 take-off structure to fiber frame termination cabinet at 500/230 kV Control Building at Nakhon Ratchasima4 substation											
2AB35-3.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 400 meters) (b) Rigid steel conduit for optical fiber cable (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 Pigtailes (1.5 meters) (1 set)	1	LOT				121,000.00	121,000.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB35-3.2	Local transportation, Construction and Installation for item 2AB35-3.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	204,800.00	204,800.00		
	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.											
<b>Total Price for Schedule 2AB35</b>								<b>Baht</b>	<b>365,000.00</b>	<b>Baht</b>	<b>589,000.00</b>	

  
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MEDIUM COST FOR BID NO. TIEC-S-06

2AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation ( excluding VAT ) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2AB38-1	DESIGN AND INSTALLATION OF EGAT'S APPLICATION SOFTWARE	Drawing nos. NR4-E-1.2 sh.1-2 Scope of work	1	SET		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
2AB38-2	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	Drawing nos. NR4-E-1.2 sh.1-2 Scope of work	1	SET		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
2AB38-3	EGAT RTU TYPE 621M	Drawing nos. NR4-E-1.2 sh.1-2 Scope of work	1	EA		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
2AB38-4	EGAT RTU TYPE 16D	Drawing nos. NR4-E-1.2 sh.1-2 Scope of work	1	EA		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
2AB38-5	Cost of Local Transportation, Construction and Installation for Item Nos. 2AB38-1 thru 2AB38-4		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	607,211.00	607,211.00		
<b>Total Price for Schedule 2AB38</b>										<b>Baht</b>	<b>607,211.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	1,000,000.00	1,000,000.00		
<b>Total Price for Schedule 2AB39</b>									<b>Baht</b>	<b>1,000,000.00</b>		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C1-1	230 kV Take off Structure Foundation (TS801&TS802) Pile Type	FD-TS-8-08	10	set	170,027.00	1,700,270.00
2C1-2	115/230 kV General equipment support structure foundation (BP701,BP801,CC704,CT702,CT802,VT703,VT803,LA401,LA402,LA701,LA801,LA802) Short Pile Type (LA802 only)	FD-GE-0-02	6	set	6,276.00	37,656.00
2C1-3	230 kV GIS Bushing support structure foundation (GTS801)	Designed by contractor TT/KK4-GTS-8-01 See scope of work	18	set	7,666.00	137,988.00
2C1-4	230kV GIB support structure foundation (GIB801)	Designed by contractor TT/KK4-GIB-8-01, TT/KK4-GIB-8-02, TT/KK4-GIB-8-03 See scope of work	Lump sum	Lump sum	422,021.00	422,021.00
2C1-5	Lighting Relay Panel foundation (RP002) Pile Type	FD-RP-0-02	1	set	5,549.00	5,549.00

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C1-6	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type	FD-LP-0-05	23	set	9,511.00	218,753.00
2C1-7	Isolating Transformer Foundation (IST) Pile Type	FD-TX-0-02	1	set	20,509.00	20,509.00
2C1-8	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	3,058,855.00	3,058,855.00
<b>Total Price for Schedule 2C1</b>					<b>Baht 5,601,601.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02, NR4-C-3	Lump sum	Lump sum	1,094,738.00	1,094,738.00
2C2-2	Cable trench, steel cover included (Type"A")	Designed by contractor SD-CE-0-02, NR4-C-3 See Scope of work	Lump sum	Lump sum	2,433,827.00	2,433,827.00
2C2-3	Cable trench, steel cover included (Type"B")	Designed by contractor SD-CE-0-02, NR4-C-3 See Scope of work	Lump sum	Lump sum	143,353.00	143,353.00
<b>Total Price for Schedule 2C2</b>					<b>Baht</b>	<b>3,671,918.00</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C3 : Building**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C3-1	230kV GIS Building	Designed by contractor SD-GIS-8-02A See scope of work	Lump sum	Lump sum	87,087,470.00	87,087,470.00
2C3-1.1	Ventilation system	-	Lump sum	Lump sum	Included in 2C3-1	Included in 2C3-1
2C3-1.2	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	3,206,771.00	3,206,771.00
<b>Total Price for Schedule 2C3</b>					<b>Baht 90,294,241.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C4 : Earth Work, Road and Crushed Rock Surfacing**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C4-1	RC.Road type " E " section 4 - 4	SD-RD-0-01	Lump sum	Lump sum	3,680,838.00	3,680,838.00
2C4-2	RC.Road type " E " section 6 - 6	SD-RD-0-01	Lump sum	Lump sum	4,303,388.00	4,303,388.00
2C4-3	Crushed rock surfacing 0.10 m thickness	NR4-C-1	Lump sum	Lump sum	1,399,975.00	1,399,975.00
<b>Total Price for Schedule 2C4</b>					<b>Baht</b>	<b>9,384,201.00</b>



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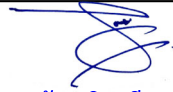
## MEDIUM COST FOR BID NO. TIEC-S-06

## 2C5 : Water Supply System

## SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C5-1	50 cu.m Underground water tank (Pile type) with piling work	WD-UT-0-01	1	set	396,501.00	396,501.00
2C5-2	Water supply system	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	192,724.00	192,724.00
2C5-3	Laying of water supply : HDPE. pipe (PN10) with valve & fittings	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	449,771.00	449,771.00
2C5-4	Laying of water supply : Galvanized steel pipe (ClassB) with valve & fittings	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	19,560.00	19,560.00
<b>Total Price for Schedule 2C5</b>					<b>Baht 1,058,556.00</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C6 : Drainage System**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
2C6-1	Drainage System	Designed by contractor Dwg no. NR4-C-6 See scope of work	Lump sum	Lump sum	7,670,336.00	7,670,336.00
2C6-2	Dia. 0.15m PVC. Pipe (Class 8.5)	Designed by contractor Dwg no. NR4-C-6 See scope of work	Lump sum	Lump sum	10,135.00	10,135.00
<b>Total Price for Schedule 2C6</b>					<b>Baht 7,680,471.00</b>	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C7-1	Architectural and Civil engineering design work	-	Lump sum	Lump sum	5,210,174.00	5,210,174.00
2C7-2	Fire Protection design work	-	Lump sum	Lump sum	154,873.00	154,873.00
2C7-3	Test and commissioning for package booster pump system	-	Lump sum	Lump sum	845.00	845.00
2C7-4	Test and commissioning for fire protection system in switchyard	-	Lump sum	Lump sum	120,990.00	120,990.00
2C7-5	Test and commissioning for GIS Building fire protection system	-	Lump sum	Lump sum	44,036.00	44,036.00
2C7-6	Dynamic Pile load test	See scope of work	Lump sum	Lump sum	481,080.00	481,080.00
2C7-7	Static pile load test	See scope of work	1	set	179,589.00	179,589.00
<b>Total Price for Schedule 2C7</b>					<b>Baht 6,191,587.00</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C8 : Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C8-1	Sub-soil investigation including field and laboratory tests (according to Spec.no.3001)	-	6	set	13,350.00	80,100.00
<b>Total Price for Schedule 2C8</b>					<b>Baht</b>	<b>80,100.00</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
2C9-1	Fire Protection System for 230kV GIS Building	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	3,771,979.00	3,771,979.00
2C9-2	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04	1	set	233,198.00	233,198.00
2C9-3	Fire Protection System for switchyard	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	3,818,551.00	3,818,551.00
2C9-4	Fire Protection environmental monitoring system	Designed by contractor Dwg no. NR4-C-9 See scope of work	Lump sum	Lump sum	657,965.00	657,965.00
<b>Total Price for Schedule 2C9</b>					<b>Baht</b>	<b>8,481,693.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation ( excluding VAT ) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
2D7-1	Note: detail and breakdown price of each equipment for each item shall be submitted together with tender documents during the bidding Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	39,959.70	39,959.70			XXXXXX	XXXXXX		
2D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	69,006.30	69,006.30			XXXXXX	XXXXXX		
2D7-3	Rupture disc of overpressure protection device spare parts for GIS (1EA for each type/each operating pressure)	1	set	THB	31,183.90	31,183.90			XXXXXX	XXXXXX		
2D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	59,615.60	59,615.60			XXXXXX	XXXXXX		
2D7-5	Maintenance closing device for circuit breaker	1	set	THB	58,325.30	58,325.30			XXXXXX	XXXXXX		
2D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	258,756.30	258,756.30			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2D7-7	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	564,173.50	564,173.50			XXXXX	XXXXX
2D7-8	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)	3	set	THB	137,943.30	413,829.90			XXXXX	XXXXX
2D7-9	Operating Analyzer Fitting Means accessories for GIS (1 EA of Fitting Means/1 set)	3	set	THB	228,661.40	685,984.20			XXXXX	XXXXX
2D7-10	Cost of Local Transportation for Item No. 2D7-1 thru 2D7-9	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	109,041.74	109,041.74
<b>Total Price for Schedule 2D7</b>				<b>THB</b>	<b>2,180,834.70</b>		<b>Baht</b>		<b>Baht</b> <b>109,041.74</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2D22 : Spare Parts for Grounding Material**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation ( excluding VAT ) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
2D22-1	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	537,639.30	537,639.30			XXXXXX	XXXXXX		
2D22-2	Cost of Local Transportation for Item No. 2D22-1											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	26,881.97	26,881.97		
				<b>THB</b>	<b>537,639.30</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 2D22</b>									<b>26,881.97</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**2D24 : Spare Parts for Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation ( excluding VAT ) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
2D24-1	BUS DIFFERENTIAL RELAY (Low Impedance- Switching Zone)	Supply as spare part Same type as supplied for item no. 2AB24-1. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				740,182.00	740,182.00	XXXXX	XXXXX		
2D24-2	LINE CURRENT DIFFERENTIAL RELAY (87L)	Supply as spare part Same type as supplied for item no. 2AB24-2. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				359,086.00	359,086.00	XXXXX	XXXXX		
2D24-3	AUTO RECLOSING AND SYNCHRONISM CHECK RELAY (79+25)	Supply as spare part Same type as supplied for item no. 2AB24-2. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				147,759.00	147,759.00	XXXXX	XXXXX		
2D24-4	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Supply as spare part Same type as supplied for item no. 2AB24-2. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				114,148.00	114,148.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2D24-5	DISTANCE RELAY (21) FOR 230 kV, 3ph without 79/25	Supply as spare part Same type as supplied for item no. 2AB24-3. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-2	1	EA			312,688.00	312,688.00	XXXXXX	XXXXXX	
2D24-6	BREAKER FAILURE RELAY (50BF+62BF)	Supply as spare part Same type as supplied for item no. 2AB24-3. 1A for current input. Drawing nos. NR4-E-1.2 sh.1-3	1	EA			139,694.00	139,694.00	XXXXXX	XXXXXX	
2D24-7	Cost of Local Transportation for Item Nos. 2D24-1 thru 2D24-6		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	15,513.00	15,513.00
<b>Total Price for Schedule 2D24</b>								<b>Baht</b> <b>1,813,557.00</b>	<b>Baht</b> <b>15,513.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2D25-1	ANALOG ISOLATOR CARD	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				78,075.00	78,075.00	XXXXX	XXXXX
2D25-2	POWER SUPPLY	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				32,301.00	32,301.00	XXXXX	XXXXX
2D25-3	ACQUISITION UNIT	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				22,954.00	22,954.00	XXXXX	XXXXX

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2D25-4	CPU & MEMORY MODULE 1	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				76,539.00	76,539.00	XXXXX	XXXXX
2D25-5	ANALOG ISOLATOR FOR VOLTAGE	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				76,539.00	76,539.00	XXXXX	XXXXX
2D25-6	ANALOG ISOLATOR FOR CURRENT	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA				76,539.00	76,539.00	XXXXX	XXXXX

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2D25-7	DIGITAL ISOLATOR MODULE	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA			74,435.00	74,435.00	XXXXX	XXXXX	
2D25-8	HARD DISK & HARD DISK CONTROLLER	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA			68,885.00	68,885.00	XXXXX	XXXXX	
2D25-9	TELE- COMMUNICATION BOARD	Supply as spare part Same type as supplied for item no. 2AB25-1. Drawing nos. NR4-E-1.2 sh.1-2	1	EA			22,954.00	22,954.00	XXXXX	XXXXX	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**  
**2D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 230 KV NAKHON RATCHASIMA 4 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply		( excluding VAT ) Baht	
						CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
Unit Price	Amount	Unit Price	Amount	Unit Price	Amount						
2D25-10	Cost of Local Transportation for Item Nos. 2D25-1 thru 2D25-9		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	12,141.00	12,141.00
<b>Total Price for Schedule 2D25</b>								<b>Baht</b>	<b>529,221.00</b>	<b>Baht</b>	<b>12,141.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB4 : Surge Arrester**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB4-1	396 kV Surge Arrester completed with corona ring, grading ring as per Ratings and Features RF SA9Y11	6		THB	435,727.60	2,614,365.60			XXXXX	XXXXX		
3AB4-2	Steel Supporting Structure for SA9Y11 ( for Item No. 3AB4-1 ), H=9.00 m as per Dwg. No. ST-LA-9-01 and SD-AB-0-01	6		THB			48,100.00	288,600.00	XXXXX	XXXXX		
3AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB4-1 thru 3AB4-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	319,326.22	319,326.22		
				THB	2,614,365.60		Baht		Baht			
<b>Total Price for Schedule 3AB4</b>							288,600.00		319,326.22			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB6-1	525 kV CCVT, 1550 kV BIL, 287500:115/63.9&115/63.9&115/63.9 V with carrier accessories, oil filled as per Ratings and Features RF PD9W11	6		THB	691,309.30	4,147,855.80			XXXXX	XXXXX		
3AB6-2	Steel Supporting Structure for PD9W11 ( for Item 3AB6-1 ) H=9.00 m. as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	6		THB			48,504.00	291,024.00	XXXXX	XXXXX		
3AB6-3	Junction Box type PT7 ( for Item 3AB6-1 ) as per Dwg. No. TP-E-18.1-3/4, TP-E-18.4 and TP-E-18.5	2		THB			40,308.40	80,616.80	XXXXX	XXXXX		
3AB6-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB6-1 thru 3AB6-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	497,144.63	497,144.63		
				THB	4,147,855.80		Baht		Baht			
<b>Total Price for Schedule 3AB6</b>							371,640.80		497,144.63			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**


**3AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB9-1	550 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 110 Mvar Y-connected five-limbed core type shunt reactor with 145 kV 3.785 Mvar neutral reactor with earthed neutral )	2		THB	6,555,038.60	13,110,077.20			XXXXX	XXXXX		
3AB9-2	Circuit breaker marshalling KIOSK for Item No. 3AB9-1 (Designed by Contractor)	2					664,470.40	1,328,940.80	XXXXX	XXXXX		
3AB9-3	Steel Supporting Structure for CB995R(IEC)* for Item No. 3AB9-1	2		THB	132,497.00	264,994.00			XXXXX	XXXXX		
3AB9-4	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with two Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 3AB9-1	1					2,223,707.20	2,223,707.20	XXXXX	XXXXX		
3AB9-5	Cost of Local Transportation, Construction and Installation for Item No. 3AB9-1 thru 3AB9-4	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,862,049.11	1,862,049.11		
<b>Total Price for Schedule 3AB9</b>				THB	<b>13,375,071.20</b>		Baht		<b>3,552,648.00</b>			
									<b>1,862,049.11</b>			

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

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB10 : Disconnecting Switch**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation	
					Foreign Supply		Local Supply		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
3AB10-1	550 kV 4000 A air switch with grounding blade (high creepage) motor operated as per Ratings and Features RF DS99KI(IEC) (phase spacing = 7.50 m.)	2			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX
3AB10-2	Steel Supporting Structure for DS99KI(IEC) as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m.	2			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX
3AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB10-1 thru 3AB10-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	615,782.27	615,782.27
<b>Total Price for Schedule 3AB10</b>									<b>Baht</b>	<b>615,782.27</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB15 : Insulator**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB15-1	Suspension insulator fog type (17" minimum leakage distance and 36,000 lb minimum combined M&E strength) as per Specification attached. (For 500kV insulator assembly, 28 units per string consisting of 26 brown-glazed discs and 2 light gray-glazed discs)	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
3AB15-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB15-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	64,439.76	64,439.76		
<b>Total Price for Schedule 3AB15</b>									<b>Baht</b>	<b>64,439.76</b>		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB18 : Low Voltage Cable and Conductor**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				779,350.00	779,350.00	XXXXX	XXXXX		
3AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				6,998,068.00	6,998,068.00	XXXXX	XXXXX		
3AB18-3	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				434,623.20	434,623.20	XXXXX	XXXXX		
3AB18-4	Aluminum conductor as per Specification attached	Lump sum	Lump sum				512,820.00	512,820.00	XXXXX	XXXXX		
3AB18-5	Cost of Local Transportation, Construction and Installation for Item No. 3AB18-1 thru 3AB18-4	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	2,399,336.83	2,399,336.83		
<b>Total Price for Schedule 3AB18</b>									<b>Baht</b>	<b>8,724,861.20</b>	<b>Baht</b>	<b>2,399,336.83</b>



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB20-1	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	269,742.00	269,742.00			XXXXX	XXXXX		
3AB20-2	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	87,516.00	87,516.00			XXXXX	XXXXX		
3AB20-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB20-1 thru 3AB20-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	98,245.95	98,245.95		
				<b>THB</b>	<b>357,258.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3AB20</b>									<b>98,245.95</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

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
3AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	790,005.70	790,005.70			XXXXX	XXXXX
3AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	217,251.57	217,251.57
				THB	790,005.70		Baht		Baht	
<b>Total Price for Schedule 3AB21</b>									217,251.57	



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT)			
					Foreign Supply		Local Supply		Baht		Baht	
					CIF Thai Port		Ex-works Price (excluding VAT)					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
3AB22-1	Thermite welding material as per Specification attached	Lump sum	Lump sum				196,597.50	196,597.50	XXXXXX	XXXXXX		
3AB22-2	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	113,685.00	113,685.00			XXXXXX	XXXXXX		
3AB22-3	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	637,897.70	637,897.70			XXXXXX	XXXXXX		
3AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB22-1 thru 3AB22-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	260,749.56	260,749.56		
				<b>THB</b>	<b>751,582.70</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3AB22</b>								<b>196,597.50</b>	<b>260,749.56</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				74,247.80	74,247.80	XXXXXX	XXXXXX		
3AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	63,247.80	63,247.80			XXXXXX	XXXXXX		
3AB23-3	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				47,000.00	47,000.00	XXXXXX	XXXXXX		
3AB23-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB23-1 thru 3AB23-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	50,736.29	50,736.29		
				<b>THB</b>	<b>63,247.80</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3AB23</b>							<b>121,247.80</b>		<b>50,736.29</b>			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-1	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos. 125R and 127R to be installed at the existing control building Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 and TP-E-10.1 Scope of work	2	EA				1,678,975.00	3,357,950.00	XXXXXX	XXXXXX		
3AB24-2	500 kV LINE PROTECTION (21P, 59L, 1-BF)	Panel No. 128R to be installed at the existing control building Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 and TP-E-10.1 Scope of work	1	EA				2,046,998.00	2,046,998.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-3	500 kV LINE PROTECTION (21P, 59L, 2-BF)	Panel No. 126R to be installed at the existing control building Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 and TP-E-10.1 Scope of work	1	EA				1,742,640.00	1,742,640.00	XXXXX	XXXXX		
3AB24-4	BREAKER FAILURE RELAY (50BF+62BF)	Install in Panel Nos. 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	2	EA				139,694.00	279,388.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount				
3AB24-5	LOCKOUT RELAY (86, 10 contacts)	Install in Panel No. 108R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	1	EA				56,190.00	56,190.00	XXXXXX	XXXXXX		
3AB24-6	LOCKOUT RELAY (86, 20 contacts)	Install in Panel Nos. 108R, 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	3	EA				89,414.00	268,242.00	XXXXXX	XXXXXX		
3AB24-7	PUSH BUTTON	Install in Panel Nos. 108R, 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	3	EA				355.00	1,065.00	XXXXXX	XXXXXX		

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## 3AB24 : Control and Protection System

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE  
SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-8	INDICATING LAMP (R,G,IL,LG)	Install in Panel Nos. 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	2	EA				443.00	886.00	XXXXXX	XXXXXX		
3AB24-9	CUT OFF SWITCH, 4 CONTACTS (50BFC0, SS, EPS, 43RCC)	Install in Panel Nos. 108R, 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	3	EA				1,731.00	5,193.00	XXXXXX	XXXXXX		
3AB24-10	TEST SWITCH (TS, for relays)	Install in Panel Nos. 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	2	EA				11,434.00	22,868.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-11	MCB, 6A, 2 POLE FOR DC SUPPLY	Install in Panel Nos. 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	2	EA				3,587.00	7,174.00	XXXXXX	XXXXXX		
3AB24-12	DC UNDERVOLTAGE RELAY (27XB,27XR)	Install in Panel Nos. 115R and 118R Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	2	EA				13,131.00	26,262.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-13	WATT AND VAR TRANSDUCER (W&VAR-TDR)	Install in Panel TDR Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2 Scope of work.	2	EA				37,528.00	75,056.00	XXXXXX	XXXXXX		
3AB24-14	VOLTAGE TRANSDUCER (V-TDR)	Install in Panel TDR Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2 Scope of work.	2	EA				27,825.00	55,650.00	XXXXXX	XXXXXX		
3AB24-15	TEST SWITCH (FOR METERING)	Install in Panel TDR Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2 Scope of work.	2	EA				29,955.00	59,910.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
						Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						CIF Thai Port							
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB24-16	MCB, 0.5A, 3 POLE FOR PT	Install in Panel TDR Specification No. 1005 Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2 Scope of work.	2	EA				2,462.00	4,924.00	XXXXX	XXXXX		
3AB24-17	Modification of The Existing Control and Protection Panels Associated with Equipment	Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		
3AB24-18	Cost of Local Transportation, Construction and Installation for Item Nos. 3AB24-1 thru 3AB24-17		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	853,884.00	853,884.00		
<b>Total Price for Schedule 3AB24</b>									<b>Baht</b>	<b>8,010,396.00</b>	<b>Baht</b>	<b>853,884.00</b>	

  
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MEDIUM COST FOR BID NO. TIEC-S-06

3AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
Unit Price	Amount	Unit Price	Amount	Unit Price	Amount						
3AB25-1	Modification of The Existing Fault Recording System	Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	Lump Sum	Lump Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	25,200.00	25,200.00
<b>Total Price for Schedule 3AB25</b>									<b>Baht</b>	<b>Baht</b>	<b>25,200.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB35-1	Optical fiber cable from joint box at 500 kV Nakhon Ratchasima4 CCT. 1 take-off structure to fiber frame termination cabinet at 500 kV GIS Building at Chaiyaphum2 substation	1	LOT									
3AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 150 meters) (b) Rigid steel conduit for optical fiber cable (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 Pigtailes (1.5 meters) (1 set)	1	LOT			85,500.00	85,500.00	XXXXXX	XXXXXX			



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB35-1.2	Local transportation, Construction and Installation for item 3AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	131,400.00	131,400.00		
	<p><b>IMPORTANT:</b></p> <p>1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification: Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22).</p> <p>2. The Bidder is required to later break down the unit price for sub-items of this Schedule for consideration.</p>											
<b>Total Price for Schedule 3AB35</b>							<b>Baht 85,500.00</b>		<b>Baht 131,400.00</b>			

  
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MEDIUM COST FOR BID NO. TIEC-S-06

3AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
3AB38-1	Modification of The Existing Remote Terminal Unit System	Dwg. Nos. PSP/CYP2-E-1.1 sh.1-2, PSP/CYP2-E-2.1 sh.1, PSP/CYP2-E-3 sh.1 Scope of work.	Lump Sum	Lump Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	33,400.00	33,400.00		
<b>Total Price for Schedule 3AB38</b>									<b>Baht</b>	<b>Baht</b>	<b>33,400.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

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
3AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	180,000.00	180,000.00
<b>Total Price for Schedule 3AB39</b>									<b>Baht</b>	<b>180,000.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3AB40 : Installation of Equipment and Steel Structure Supplied by EGAT**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
3AB40-1	Dismantlement	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	125,000.00	125,000.00		
							<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3AB40</b>									<b>125,000.00</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
3C1-1	500 kV Neutral reactor foundation ( NR901 ) pad type	FD-NR-9-01	2	set	38,292.00	76,584.00
<b>Total Price for Schedule 3C1</b>					<b>Baht</b>	<b>76,584.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
3C7-1	Fire Protection design work	-	Lump sum	Lump sum	39,564.00	39,564.00
3C7-2	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)	-	2	set	42,500.00	85,000.00
<b>Total Price for Schedule 3C7</b>					<b>Baht 124,564.00</b>	

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
3C9-1	Fire Protection System for transformer / shunt reactor	Designed by contractor Dwg no. CYP2-C-9 See scope of work	2	set	660,126.00	1,320,252.00
3C9-2	Fire Protection environmental monitoring system	Designed by contractor Dwg no. CYP2-C-9 See scope of work	Lump sum	Lump sum	657,965.00	657,965.00
<b>Total Price for Schedule 3C9</b>					<b>Baht</b>	<b>1,978,217.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**3D22 : Spare Parts for Grounding Material**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					Unit Price	Amount	Unit Price	Amount				
3D22-1	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	1	set	THB	964,825.40	964,825.40			XXXXX	XXXXX		
3D22-2	Cost of Local Transportation for Item No. 3D22-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	48,241.27	48,241.27		
				<b>THB</b>	<b>964,825.40</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3D22</b>									<b>48,241.27</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB5 : Current Transformer and Junction Box**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB5-1	230 kV CT, 900 kV BIL, 500/-/4000:1//1//1//1//1 A, 50 kA, oil filled as per Rating and Features RF CT8AF4	12		THB	270,857.40	3,250,288.80			XXXXX	XXXXX		
4AB5-2	Steel Supporting Structure for CT8AF4 ( for Item No. 4AB5-1 ), H=5.50 m as per Dwg. No. ST-CT-4-01 and SD-AB-0-01	12		THB			32,336.00	388,032.00	XXXXX	XXXXX		
4AB5-3	Junction Box type CT6 ( for Item No. 4AB5-1 ) as per Dwg. No. TP-E-18.2 and TP-E-18.4	4		THB			43,440.10	173,760.40	XXXXX	XXXXX		
4AB5-4	Cost of Local Transportation, Construction and Installation for Item No. 4AB5-1 thru 4AB5-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	419,328.93	419,328.93		
				<b>THB</b>	<b>3,250,288.80</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 4AB5</b>							<b>561,792.40</b>		<b>419,328.93</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box  
SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB6-1	230 kV CCVT, 900 kV BIL, 138000:119.5/69 & 119.5/69 V with carrier accessories, oil filled as per Ratings and Features RF PD8W1J	6		THB	294,167.50	1,765,005.00			XXXXXX	XXXXXX		
4AB6-2	Steel Supporting Structure for PD8W1J ( for item no.4AB6-1 ), H = 5.50 m. as per Dwg. No. ST-VT-4-01 and SD-AB-0-01	6		THB			24,252.00	145,512.00	XXXXXX	XXXXXX		
4AB6-3	Junction Box type PT11 ( for Item No. 4AB6-1 ) as per Dwg. No. TP-E-18.1-2/4, 3/4 and TP-E-18.4	2		THB			34,889.80	69,779.60	XXXXXX	XXXXXX		
4AB6-4	Cost of Local Transportation, Construction and Installation for Item No. 4AB6-1 thru 4AB6-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	217,832.63	217,832.63		
				<b>THB</b>	<b>1,765,005.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 4AB6</b>							<b>215,291.60</b>		<b>217,832.63</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT)			
					Foreign Supply		Local Supply		Baht		Baht	
					CIF Thai Port		Ex-works Price (excluding VAT)					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB9-1	245 kV 4000 A 50 kA GCB 3 pole trip as per Ratings and Features RF CB8955(IEC)	4		THB	1,426,547.10	5,706,188.40			XXXXXX	XXXXXX		
4AB9-2	Steel Supporting Structure for CB8955(IEC)* for Item No. 4AB9-1	4		THB	101,050.00	404,200.00			XXXXXX	XXXXXX		
4AB9-3	Cost of Local Transportation, Construction and Installation for Item No. 4AB9-1 thru 4AB9-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	672,142.72	672,142.72		
				<b>THB</b>	<b>6,110,388.40</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 4AB9</b>									<b>672,142.72</b>			

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

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB10 : Disconnecting Switch**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT)			
					Foreign Supply		Local Supply		Baht		Baht	
					CIF Thai Port		Ex-works Price (excluding VAT)					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB10-1	245 kV 4000 A air switch manually gang operated as per Ratings and Features RF DS89B1(IEC) (phase spacing = 3.50 m.)	10		THB	435,047.80	4,350,478.00			XXXXX	XXXXX		
4AB10-2	245 kV 4000 A air switch with grounding blade manually gang operated as per Ratings and Features RF DS89B2(IEC) (phase spacing = 3.50 m.)	2		THB	570,751.50	1,141,503.00			XXXXX	XXXXX		
4AB10-3	Steel Supporting Structure for DS89B1(IEC) as per EGAT's Dwg. No. ST-DS-4-01 and SD-AB-0-01, H = 6.00 m.	10					101,050.00	1,010,500.00	XXXXX	XXXXX		
4AB10-4	Steel Supporting Structure for DS89B2(IEC) as per EGAT's Dwg. No. ST-DS-4-01 and SD-AB-0-01, H = 6.00 m.	2					101,050.00	202,100.00	XXXXX	XXXXX		
4AB10-5	Cost of Local Transportation, Construction and Installation for Item No. 4AB10-1 thru 4AB10-4	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	737,503.91	737,503.91		
<b>Total Price for Schedule 4AB10</b>				<b>THB</b>	<b>5,491,981.00</b>		<b>Baht</b>		<b>Baht</b>			
								<b>1,212,600.00</b>		<b>737,503.91</b>		

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB12 : AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB12-1	Termination Box type TB1 as per Dwg No. LT-TB-0-01	3					6,628.97	19,886.91	XXXXX	XXXXX		
4AB12-2	Cost of Local Transportation, Construction and Installation for Item No. 4AB12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	2,187.56	2,187.56		
<b>Total Price for Schedule 4AB12</b>								<b>19,886.91</b>	<b>2,187.56</b>			

  
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## MEDIUM COST FOR BID NO. TIEC-S-06

## 4AB14 : Substation Steel Structure

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB14-1	230 kV take-off structure (TS802) as per Dwg. No. ST-TS-8-02	6					367,015.00	2,202,090.00	XXXXX	XXXXX		
4AB14-2	230 kV beam (BB802) as per Dwg. No. ST-BB-8-02	4					141,794.00	567,176.00	XXXXX	XXXXX		
4AB14-3	230 kV bus pole structure (BP803) as per Dwg. No. ST-BP-8-01 (H = 3.79 m.)	28					19,402.00	543,256.00	XXXXX	XXXXX		
4AB14-4	230 kV bus pole structure (BP804) as per Dwg. No. ST-BP-8-01 (H = 6.75 m.)	18					33,380.00	600,840.00	XXXXX	XXXXX		
4AB14-5	Overhead ground wire structure (OS1) as per Dwg. No. RS-TE106-C4.8 (H = 15.00 m.)	1					113,176.00	113,176.00	XXXXX	XXXXX		
4AB14-6	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	14					10,105.00	141,470.00	XXXXX	XXXXX		
4AB14-7	Cost of Local Transportation, Construction and Installation for Item No. 4AB14-1 thru 4AB14-6	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	1,146,202.20	1,146,202.20	
<b>Total Price for Schedule 4AB14</b>								<b>Baht</b> <b>4,168,008.00</b>	<b>Baht</b> <b>1,146,202.20</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB15 : Insulator**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB15-1	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		
4AB15-2	230 kV station post insulator ANSI TR. No. 308 as per Specification attached	Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX		
4AB15-3	Cost of Local Transportation, Construction and Installation for Item No. 4AB15-1 thru 4AB15-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	191,390.54	191,390.54		
<b>Total Price for Schedule 4AB15</b>									<b>Baht</b>	<b>191,390.54</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB18 : Low Voltage Cable and Conductor**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and ( excluding VAT ) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				203,830.00	203,830.00	XXXXX	XXXXX		
4AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				3,077,140.00	3,077,140.00	XXXXX	XXXXX		
4AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				2,508.00	2,508.00	XXXXX	XXXXX		
4AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				49,588.00	49,588.00	XXXXX	XXXXX		
4AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				1,416,290.70	1,416,290.70	XXXXX	XXXXX		
4AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				683,760.00	683,760.00	XXXXX	XXXXX		
4AB18-7	Overhead ground wire as per Specification attached	Lump sum	Lump sum				7,018.00	7,018.00	XXXXX	XXXXX		
4AB18-8	Cost of Local Transportation, Construction and Installation for Item No. 4AB18-1 thru 4AB18-7	Lump sum	Lump sum			XXXXX	XXXXX	XXXXX	XXXXX	1,496,037.04	1,496,037.04	
<b>Total Price for Schedule 4AB18</b>								<b>Baht</b> <b>5,440,134.70</b>	<b>Baht</b> <b>1,496,037.04</b>			

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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB19 : Switchyard Lighting Fixtures**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply		Unit Price	Amount	Unit Price	Amount
					CIF Thai Port		Ex-works Price (excluding VAT) Baht					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	6					10,568.80	63,412.80	XXXXXX	XXXXXX		
4AB19-2	Cost of Local Transportation, Construction and Installation for Item No. 4AB19-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	17,438.52	17,438.52		
<b>Total Price for Schedule 4AB19</b>								<b>Baht 63,412.80</b>	<b>Baht 17,438.52</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB20 : Aluminum Tube, Connector and Miscellaneous Hardware**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT)			
					Foreign Supply		Local Supply		Baht		Baht	
					CIF Thai Port		Ex-works Price (excluding VAT)					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB20-1	Aluminum tube as per Specification attached	Lump sum	Lump sum				1,127,319.60	1,127,319.60	XXXXXX	XXXXXX		
4AB20-2	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				336,336.00	336,336.00	XXXXXX	XXXXXX		
4AB20-3	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				313,365.80	313,365.80	XXXXXX	XXXXXX		
4AB20-4	Cost of Local Transportation, Construction and Installation for Item No. 4AB20-1 thru 4AB20-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	488,680.89	488,680.89		
<b>Total Price for Schedule 4AB20</b>									<b>Baht</b>	<b>1,777,021.40</b>	<b>Baht</b>	<b>488,680.89</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		( excluding VAT ) Baht		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB21-1	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	1,143,675.50	1,143,675.50			XXXXXX	XXXXXX		
4AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 4AB21-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	314,510.76	314,510.76		
<b>Total Price for Schedule 4AB21</b>				THB	<b>1,143,675.50</b>		Baht		Baht <b>314,510.76</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		( excluding VAT ) Baht		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB22-1	Thermite welding material as per Specification attached	Lump sum	Lump sum				315,176.40	315,176.40	XXXXXX	XXXXXX		
4AB22-2	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	182,256.80	182,256.80			XXXXXX	XXXXXX		
4AB22-3	Cost of Local Transportation, Construction and Installation for Item No. 4AB22-1 thru 4AB22-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	136,794.13	136,794.13		
				<b>THB</b>	<b>182,256.80</b>	<b>Baht</b>	<b>315,176.40</b>		<b>Baht</b>	<b>136,794.13</b>		
<b>Total Price for Schedule 4AB22</b>												

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation			
					Foreign Supply		Local Supply		( excluding VAT ) Baht		( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				247,438.40	247,438.40	XXXXX	XXXXX		
4AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	132,110.00	132,110.00			XXXXX	XXXXX		
4AB23-3	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				79,244.00	79,244.00	XXXXX	XXXXX		
4AB23-4	Cost of Local Transportation, Construction and Installation for Item No. 4AB23-1 thru 4AB23-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	126,167.91	126,167.91		
				<b>THB</b>	<b>132,110.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 4AB23</b>							<b>326,682.40</b>		<b>126,167.91</b>			

  
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MEDIUM COST FOR BID NO. TIEC-S-06

4AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
4AB24-1	230 kV LINE PROTECTION (87L, 3ph, 79)	Panel Nos. 15R and 17R to be installed at the existing control building Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1, NR3-E-2.1 sh.1, NR3-E-3 sh.1 and TP-E-10.1 Scope of work.	2	EA				938,975.00	1,877,950.00	XXXXXX	XXXXXX		
4AB24-2	230 kV LINE PROTECTION (21P, 3ph, 2-BF)	Panel Nos. 16R and 18R to be installed at the existing control building Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1, NR3-E-2.1 sh.1, NR3-E-3 sh.1 and TP-E-10.1 Scope of work.	2	EA				419,244.00	838,488.00	XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
4AB24-3	E1 Converter Panel	Panel No. E1 CONV. to be installed at the existing control building Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1, NR3-E-2.1 sh.1, NR3-E-3 sh.1 and TP-E-10.20 Scope of work.	1	EA				419,244.00	419,244.00	XXXXX	XXXXX		
4AB24-4	MARSHALLING PANEL FOR FRS	Panel No. MP-FRS8-2 installed at the existing control building Specification No. 1002 Dwg.Nos. NR3-E-1.1 sh.1 and TP-E-10.3 Scope of work.	1	EA				352,081.00	352,081.00	XXXXX	XXXXX		
4AB24-5	WATT AND VAR TRANSDUCER (W&VAR-TDR)	Install in existing Panel No. TDR8-1 Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1 Scope of work.	2	EA				37,528.00	75,056.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
						Foreign Supply		Local Supply					
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
						Unit Price	Amount	Unit Price	Amount				
4AB24-6	VOLTAGE TRANSDUCER (V-TDR)	Install in existing Panel No. TDR8-1 Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1 Scope of work.	2	EA				27,825.00	55,650.00	XXXXX	XXXXX		
4AB24-7	TEST SWITCH (FOR METERING)	Install in existing Panel No. TDR8-1 Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1 Scope of work.	2	EA				29,955.00	59,910.00	XXXXX	XXXXX		
4AB24-8	MCB, 0.5A, 3 POLE FOR PT	Install in existing Panel No. TDR8-1 Specification No. 1002 Dwg. Nos. NR3-E-1.1 sh.1 Scope of work.	2	EA				2,462.00	4,924.00	XXXXX	XXXXX		
4AB24-9	Modification of The Existing Control and Protection Panels Associated with Equipment	Dwg. Nos. NR3-E-1.1 sh.1, NR3-E-2.1 sh.1, NR3-E-3 sh.1 Scope of work.	Lum Sum	Lum Sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX		

  
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MEDIUM COST FOR BID NO. TIEC-S-06

4AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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
4AB24-10	Cost of Local Transportation and Installation for Item Nos. 4AB24-1 thru 4AB24-9		Lum Sum	Lum Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	581,401.00	581,401.00
<b>Total Price for Schedule 4AB24</b>									<b>Baht</b>	<b>3,683,303.00</b>	<b>Baht</b> <b>581,401.00</b>

  
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MEDIUM COST FOR BID NO. TIEC-S-06

4AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
4AB25-1	FAULT RECORDING SYSTEM, 48 ANALOG INPUT, 144 DIGITAL INPUT.	Dwg. Nos. NR3-E-1.1 sh.1 and TP-E-10.2 Installed in 230kV Control Building Scope of work.	1	EA				2,459,108.00	2,459,108.00	XXXXXX	XXXXXX		
4AB25-2	Modification of The Existing Fault Recording System	Dwg. No. NR3-E-1.1 sh.1 Scope of work.	Lum Sum	Lum Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX		
4AB25-3	Cost of Local Transportation, Construction and Installation for Item Nos. 4AB25-1 thru 4AB25-2		Lum Sum	Lum Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	266,336.00	266,336.00		
<b>Total Price for Schedule 4AB25</b>								<b>Baht 2,459,108.00</b>		<b>Baht 266,336.00</b>			

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
4AB35-1 4AB35-1.1	Optical fiber cable from joint box at 230 kV Nakhon Ratchasima4 CCT. 1 take-off structure to fiber frame termination cabinet at Control Building at Nakhon Ratchasima3 substation Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 350 meters) (b) Rigid steel conduit for optical fiber cable (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 meters) (1 set)	1	LOT				108,500.00	108,500.00	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

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	
4AB35-1.2	Local transportation, Construction and Installation for item 4AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	188,800.00	188,800.00	
	<p><b>IMPORTANT:</b></p> <p>1. Telecommunication Equipment supplied under Schedule AB35 shall conform to Telecommunication Equipment Specification: Single Sheath Non-metallic Optical Fiber Cable (SD-FOT-P22).</p> <p>2. The Bidder is required to later break down the unit price for sub-items of this Schedule for consideration.</p>										
<b>Total Price for Schedule 4AB35</b>								<b>Baht</b>	<b>108,500.00</b>	<b>Baht</b>	<b>188,800.00</b>



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MEDIUM COST FOR BID NO. TIEC-S-06

4AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY

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		Unit Price	Amount	Unit Price	Amount
						CIF Thai Port		Ex-works Price (excluding VAT) Baht					
4AB38-1	Modification of The Existing Remote Terminal Unit System	Dwg. Nos. NR3-E-1.1 sh.1, NR3-E-2.1 sh.1, NR3-E-3 sh.1 Scope of work.	Lump Sum	Lump Sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	27,400.00	27,400.00		
<b>Total Price for Schedule 4AB38</b>									<b>Baht</b>	<b>Baht</b>	<b>27,400.00</b>		

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO  
ENHANCE SYSTEM SECURITY**

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
4AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	320,000.00	320,000.00
<b>Total Price for Schedule 4AB39</b>									<b>Baht</b>	<b>320,000.00</b>

  
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**MEDIUM COST FOR BID NO. TIEC-S-06**

**4C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
4C1-1	230 kV Take off Structure Foundation (TS802) Pad Type	FD-TS-8-07	6	set	156,499.00	938,994.00
4C1-2	230/69 kV Overhead groundwire structure foundation (OG1) Pad Type	FD-OG-0-01	1	set	107,268.00	107,268.00
4C1-3	115/230 kV General equipment support structure foundation (BP701,BP801,CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Pad Type (BP801 only)	FD-GE-0-01	46	set	11,599.00	533,554.00
4C1-4	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02	14	set	2,514.00	35,196.00
4C1-5	230 kV Circuit breaker foundation (CBT801) Pad Type	FD-CB-8-34	4	set	157,097.00	628,388.00
4C1-6	230 kV Disconnecting Switch Support foundation (DS802,DS802A,DS802B,DS803,DS804) Pad Type (DS802 only)	FD-DS-8-03	12	set	42,023.00	504,276.00

  
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 ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง

**MEDIUM COST FOR BID NO. TIEC-S-06**

**4C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK  
AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
4C1-7	115/230 kV General equipment support structure foundation (BP701,BP801,CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Pad Type (CT802 only)	FD-GE-0-01	12	set	11,599.00	139,188.00
4C1-8	115/230 kV General equipment support structure foundation (BP701,BP801,CC704,CT702,CT802,VT703,VT803, LA401, LA402, LA801, LA802) Pad Type (VT803 only)	FD-GE-0-01	6	set	11,599.00	69,594.00
<b>Total Price for Schedule 4C1</b>					<b>Baht 2,956,458.00</b>	

  
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 02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

**4C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
4C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02	Lump sum	Lump sum	1,946,782.00	1,946,782.00
<b>Total Price for Schedule 4C2</b>					<b>Baht 1,946,782.00</b>	

  
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 02 Feb 2026

**MEDIUM COST FOR BID NO. TIEC-S-06**

**4C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION FOR EXPANSION OF 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
4C7-1	Plate bearing test	See scope of work	1	set	6,500.00	6,500.00
<b>Total Price for Schedule 4C7</b>					<b>Baht 6,500.00</b>	

  
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 02 Feb 2026

**Important Information**  
**for**  
**Invitation to Bid No. TIEC-S-06**

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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:

**Article A-3. Eligibility of Bidders: General Requirements**

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

**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-6. Preparation and Delivery of Bids**

Details of technical proposal opening time and place shall be specified in the Tentative Schedule.

**Article A-7. Availability of Bidding Documents**

Availability of Bidding Documents has been changed from CD-ROM to electronic files for download via link provided by EGAT.

## **Channel of Documents Submission**

For channel of document submission in the hereunder Articles, facsimile and telex has been replaced with letters submitted electronically or electronic mails (E-mails).

- B-1. Preparation of Bids
- B-4. Validity of Bids
- D-9. Notices
- E-20. Documents Required for Each Shipment
- F-11. Payment

## **Section B : Overview of the Procurement Process**

The procurement process diagram has been updated.

### **Article B-2. Bid Prices**

For Source of Supply and Service 1. Prices for Equipment, Prices for Equipment manufactured outside Thailand (imported Equipment), shall be firm CIF Thai Port basis and quoted in Thai baht, US dollar, euro, Japanese yen, renminbi (Chinese yuan), or in the Bidder's or Manufacturer's home currency only if his currency trading is prevailed at the time of bidding in any international market other than in Bidder's or Manufacturer's home country.

### **Article B-8. Information to be Submitted with Bid**

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

### **Article E-19. Shipment**

The Maritime Promotion Bureau has been updated to the Maritime Promotion Division and its contact information has also been updated.

**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.

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

**Article G-3. Contractor's Office and Other Construction Facilities**

Details of vehicles and relevant conditions to be provided by the Contractor for inspection of the work have been added at the end of this article.

# DATA SHEET

for

## Invitation to Bid No. TIEC-S-06

(Two-envelope)

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

### **Article A-3. Eligibility of Bidders: General Requirements**

The following requirement shall be added to Article A-3. Eligibility of Bidders: General Requirements, item I.:

- j. Bidders shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement together with supporting evidence pursuant to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017).*

### **Article B-3. Bid Security**

The amount of bid security shall be USD 3,967,340.- or THB 124,000,000.-.

### **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 minimum standards of the policy and directions for anti-corruption in relation to procurement, together with the completely filled out Anti-Corruption Compliance Checklist as provided, and supporting evidence.*

*Where the Bidder holding a certification under ISO 37001 Anti-Bribery Management Systems, certification from the Thai Private Sector Collective Action against Corruption (CAC Certified), or any certification as prescribed by the Anti-Corruption Co-operation Committee, shall be deemed to have satisfied the minimum standards of the policy and directions for anti-corruption in relation to procurement. Such certification documents may be submitted as part of the bid.*

*Such minimum standards of the policy and directions for anti-corruption in relation to procurement, or the certification, shall remain valid and effective from the technical proposal opening date.*

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

If the Contractor fails to meet any of the completion dates for Schedule 1 : 500 kV Nakhon Ratchasima 4 Substation (GIS) or Schedule 2 : 230 kV Nakhon Ratchasima 4 Substation (GIS) or Schedule 3 : 500 kV Chaiyaphum 2 Substation (GIS) or Schedule 4 : 230 kV Nakhon Ratchasima 3 Substation, the liquidated damages shall be at the rate of one-tenth of one (0.10) per cent of the total Contract Price for Schedule 1 : 500 kV Nakhon Ratchasima 4 Substation (GIS) and Schedule 2 : 230 kV Nakhon Ratchasima 4 Substation (GIS) and Schedule 3 : 500 kV Chaiyaphum 2 Substation (GIS) and Schedule 4 : 230 kV Nakhon Ratchasima 3 Substation for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred.

**Maintenance Guarantee Period**

- For all Work except 500 kV System

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

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

- For 500 kV System

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

**Defective Equipment to be replaced with the whole new set**

Not Applicable

**Article F-11. Payment**

*The following paragraphs shall be added as the last two paragraphs of this article:*

*“ Please note that the Contractor shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement or a certification of anti-corruption standards that are valid until the date of receipt of the final payment under the Contract.*

*In the case where EGAT finds that the validity period of the Contractor's submitted minimum standards of the policy and directions for anti-corruption in relation to procurement, or the relevant certification, will expire before the date of receipt of the final payment under the Contract, EGAT shall issue a written notification to the Contractor requiring the submission of a revised or updated, completely filled out Anti-Corruption Compliance Checklist together with supporting evidence, prior to the expiration date of the existing Anti-Corruption Compliance Checklist. ”*

**Article G-3. Contractor's Office and Other Construction Facilities**

The provision regarding vehicles for EGAT's inspection under this article shall not be applicable. All other terms and conditions specified in this article shall remain applicable.

# **ELECTRICITY GENERATING AUTHORITY OF THAILAND**

Nonthaburi  
Thailand

## **INVITATION TO BID NO. TIEC-S-06**

### **SUPPLY AND CONSTRUCTION OF 500/230 kV NAKHON RATCHASIMA 4 SUBSTATION (GIS) AND EXPANSION OF 500 kV CHAIYAPHUM 2 (GIS) AND 230 kV NAKHON RATCHASIMA 3 SUBSTATIONS**

### **TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN, LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA TO ENHANCE SYSTEM SECURITY**

**(TWO-ENVELOPE)**

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#### **A-1. Invitation**

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 500/230 kV Nakhon Ratchasima 4 Substation (GIS) and Expansion of 500 kV Chaiyaphum 2 (GIS) and 230 kV Nakhon Ratchasima 3 Substations under Transmission System Improvement Project in Northeastern, Lower Northern, Central Regions and Bangkok Area to Enhance System Security as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

#### **A-2. Work Description**

The supply and construction of 500/230 kV Nakhon Ratchasima 4 Substation (GIS) and Expansion of 500 kV Chaiyaphum 2 (GIS) and 230 kV Nakhon Ratchasima 3 Substations will be on a supply and construction basis, the Contractor shall be responsible for complete supply, installation, construction and also engineering design work to the standard specified and best modern practice. The substations to be constructed and the scope of work under this Invitation are described in Section H. Scope of Work.

#### **A-3. Eligibility of Bidders: General Requirements**

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

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

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

In case the Bidder's name is not exactly the same as the purchaser's name, the purchaser shall notify EGAT of the name of the Bidder in writing prior to the *technical proposal* 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 500 kV or above conventional or GIS substation, with its overall performance satisfactory to EGAT;
  - 2) Having experience in executing at least three (3) contracts as contractor (not as subcontractor) for supply and construction of a complete 420 kV or above maximum system voltage conventional or GIS substation, with at least three (3) consecutive years of operation. At least one of these three contracts shall be executed and performed in an overseas country (not his own country);
  - 3) For local firm, Having experience with EGAT in executing at least five (5) contracts as contractor (not as subcontractor) for supply and construction of 220 kV or above conventional or GIS substation with at least three (3) consecutive years of operation, with its overall performance satisfactory to EGAT. At least three of these five contracts shall be complete substation;

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 2) mentioned above, having an excellent reputation and adequate technical knowledge and practical experience on design, construction, installation and commissioning of at least three (3) 420 kV or above maximum system voltage conventional or GIS complete substation, with at least three (3) consecutive years of operation. At least one of these three contracts shall be in an overseas country (not his own country). Bidder shall also demonstrate his capacity to perform Work.

Further to b.3) mentioned above, having an excellent reputation and adequate technical knowledge and practical experience on design, construction, installation and commissioning of at least three (3) 220 kV or above EGAT's conventional or GIS substations with at least three (3) consecutive years of operation. Bidder shall also demonstrate his capacity to perform the 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.8. 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 500 kV Ratings of Gas-Insulated Switchgear (GIS) or Gas-Insulated Bus (GIB). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

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

In case that supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed/modified type of such Equipment with successful operation/use of at least three (3) substations of which total GIS bays shall not be less than twelve (12) and for minimum one (1) year in overseas country (not his own country). The detailed information of the development/modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider/accept the proposed developed/modified type

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

- 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 500 kV 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.
7. For 230/115 kV Ratings of Gas-Insulated Switchgear (GIS). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:
  - 7.1 Having one of the following qualifications:
    - 7.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.
    - OR
    - 7.1.2 For 230 kV Gas-Insulated Switchgear (GIS):

Having a supply record of Equipment of the type proposed (type of enclosure, interrupter or circuit breaker, rated filling gas pressure) at the nominal system voltage of 220 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least three (3) consecutive years in overseas country (not his own country) and at least three (3) substations of which total GIS bays shall not be less than twelve (12).

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 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 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.

For 115 kV Gas-Insulated Switchgear (GIS):

Having a supply record of Equipment of the type proposed (type of enclosure, interrupter or circuit breaker, rated filling gas pressure) at the 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 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 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 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.

7.2 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.

8. For 230 kV Control and Protection Panel and below, having the following qualifications:

8.1 Being local manufacturer.

8.2 Having one of the following qualifications:

8.2.1 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

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

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

- a. The Bidder shall have sufficient capacity to carry out the work.
- b. The Bidder shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. In case the Bidder is a joint venture/consortium, either member of the joint venture/consortium shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT.
- c. The Bidder himself or his subcontractors, at the time of submitting this proposal, shall not carry excessive work nor be in a default position with respect to work with EGAT. Unsatisfactory past performance on Contract awarded by EGAT may be a sufficient reason of being disqualified.
- d. The Bidder shall propose Equipment from manufacturers who fulfill the requirements below. If there is any deficiency, EGAT reserves the right to require the Bidder to propose new manufacturer or new type/model of Equipment without any additional cost to EGAT.
  1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
  2. Being well-established and maintaining a permanent place of business
  3. The manufacturer shall have the experience records that meet the requirements set forth herein.

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

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item II.d.5 thru II.d.17 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 500 kV Ratings of following Equipment: Power Circuit Breaker, Instrument Transformer, Surge Arrester and Disconnecting Switch. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

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

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

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

- 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 230/115 kV Ratings of Power Circuit Breaker, Disconnecting Switch and 115 kV Compact Switchgear 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 For 230 kV Power Circuit Breaker and Disconnecting Switch:

Having a supply record of Equipment of the type proposed at nominal system voltage of 220 kV or above, 3000 A or above, 50 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 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 of at least one (1) year in overseas country (not his own country) and at least three (3) three phase sets. The detailed information of the development or modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider or accept the proposed developed or modified type.

For 115 kV Power Circuit Breaker, Disconnecting Switch and Compact Switchgear:

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 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 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.

- 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 230/115 kV Ratings of following Equipment: Instrument Transformer, Surge Arrester and Disconnecting Switch. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

- 7.1 Having one of the following qualifications:

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

OR

- 7.1.2 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 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.

- 7.2 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.
8. For 33, 22 and 11 kV ratings of following equipment: Metal-Clad SF<sub>6</sub> Gas Insulated Switchgear, Power Circuit Breaker, Instrument Transformer, Disconnecting Switch and Surge Arrester

Having one of the following qualifications:

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

OR

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

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

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

9. 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, 115 kV and below 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

9.1 Being local manufacturer for the following Equipment:

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

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

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

9.3 Having one of the following qualifications:

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

OR

9.3.2 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).

10. For Insulator

Having one of the following qualifications:

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

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

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

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 Stationary Battery

Having one of the following qualifications:

- 11.1 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

- 11.2 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).

12. For above 33kV through 500 kV Outdoor Type Cable Termination and Cable Termination for GIS.

Having one of the following qualifications:

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

OR

- 12.2 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.

13. For 230 kV XLPE Power Cable

Having one of the following qualifications:

13.1 Having a supply record of Equipment of the type and similar ratings proposed with successful operation/use for at least three (3) consecutive years in an overseas country (not his own country).

OR

13.2 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).

14. 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.

15. For Fault Recording System.

15.1 Having one of the following qualifications:

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

OR

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

15.1.2.1 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

15.1.2.2 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.

- 15.2 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.
  16. Being local manufacturer for steel supporting structure of Instrument Transformer, Surge Arrester and Disconnecting Switch.
  17. For Closed-circuit television (CCTV) system and equipment
    - 17.1 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.
    - 17.2 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.
    - 17.3 The bidder or subcontractor shall have one of the following qualifications:
      - 17.3.1 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
    - 17.3.2 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.
  - 17.4 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. TIEC-S-06

SUPPLY AND CONSTRUCTION OF 500/230 kV NAKHON RATCHASIMA 4  
SUBSTATION (GIS) AND EXPANSION OF 500 kV CHAIYAPHUM 2 (GIS)  
AND 230 kV NAKHON RATCHASIMA 3 SUBSTATIONS

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN,  
LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA  
TO ENHANCE SYSTEM SECURITY

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. TIEC-S-06

SUPPLY AND CONSTRUCTION OF 500/230 kV NAKHON RATCHASIMA 4  
SUBSTATION (GIS) AND EXPANSION OF 500 kV CHAIYAPHUM 2 (GIS)  
AND 230 kV NAKHON RATCHASIMA 3 SUBSTATIONS

TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN,  
LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK AREA  
TO ENHANCE SYSTEM SECURITY

PRICE PROPOSAL

The Envelope **II** 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

**EGAT** 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 ***place and*** time specified ***in***  
**Tentative Schedule.**

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 are available for examination *and online purchase at <http://www4.egat.co.th/fprocurement/biddingeng/>* and can be obtained *by downloading via link provided by EGAT* upon payment to EGAT, non-refundable, in the amount of USD ...1,000.... or Baht ...30,000..... . These prices include the value added tax.

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

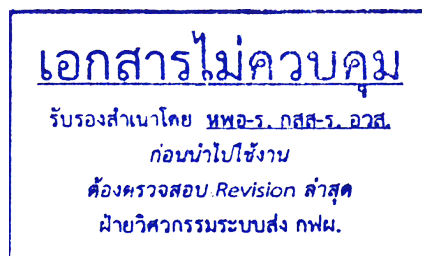
Accepted Type	Manufacturer
IDM+	Qualitrol
M871	GE
7KE85 (*)	Siemens
TESLA 4000 (*)	ERL Phase
TR 2100	Rochester (RIS)
TR 3000 (**)	

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

- 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.
- 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 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



**เอกสารไม่ควบคุม**  
 รับรองสำเนาโดย **หนอ-ร.กสส-ร.อวส.**  
 ก่อนนำไปใช้งาน  
 ต้องตรวจสอบ **Revision** ล่าสุด  
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

EGAT ACCEPTED MANUFACTURER LIST FOR FAULT RECORDING SYSTEM

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

Bid No. TIEC-S-06

**เอกสารไม่ควบคุม**  
รับรองสำเนาโดย ทพอ.ร. กสส.ร. อวส.  
ก่อนนำไปใช้งาน  
ต้องตรวจสอบ Revision ล่าสุด  
ฝ่ายวิศวกรรมระบบส่ง กฟผ.

30 ธันวาคม 2568

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

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

Notes

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

**เอกสารไม่ควบคุม**  
 รับรองสำเนาโดย **ทพอ.ร.กสส.ร.อวส.**  
 ก่อนนำไปใช้งาน  
 ต้องตรวจสอบ **Revision** ล่าสุด  
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

30 ธันวาคม 2568

## SCOPE OF WORK

### **H-1. General**

<u>No.</u>	<u>Substation</u>	<u>Page</u>
1.	500/230 KV NAKHON RATCHASIMA 4 (GIS)	
	- GENERAL	H1-1
	- ELECTRICAL PART	H1A-1
	- CONTROL AND PROTECTION PART	H1B-1
	- COMMUNICATION PART	H1C-1
	- CIVIL AND ARCHITECTURAL PART	H1D-1
2.	500 KV CHAIYAPHUM 2 SUBSTATION (GIS)	
	- GENERAL	H2-1
	- ELECTRICAL PART	H2A-1
	- CONTROL AND PROTECTION PART	H2B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART	H2D-1
3.	230 KV NAKHON RATCHASIMA 3 SUBSTATION	
	- GENERAL	H3-1
	- ELECTRICAL PART	H3A-1
	- CONTROL AND PROTECTION PART	H3B-1
	- COMMUNICATION PART (NONE)	-
	- CIVIL AND ARCHITECTURAL PART	H3D-1

## **1. 500/230 KV NAKHON RATCHASIMA 4 (GIS)**

### **GENERAL**

The Bid No. TIEC-S-06 comprises four (4) schedules. Schedule 1 and schedule 2 are for NAKHON RATCHASIMA 4 Substation. The NAKHON RATCHASIMA 4 substation is a new 500/230 kV Substation with new Gas Insulated Switchgear (GIS) which is being constructed to support Transmission System Improvement Project in Northeastern, Lower Northern, Central Regions and Bangkok Area to enhance system security. The Substation is located in Pak Thong Chai District, NAKHON RATCHASIMA Province. The details in Job No. TIEC-03-S02 are as follows:

#### **Schedule 1 : 500 kV NAKHON RATCHASIMA 4 substation (GIS)**

The new 500 kV substation shall consist of 500 kV indoor GIS and the bus arrangement shall be Breaker and a half which consists of eight (8) feeders as follows:

- Two (2) feeders for 500 kV Line No. 1 & No. 2 to WANG NOI Substation
- Two (2) feeders for 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer “KT1A&KT2A”
- Two (2) feeders for 500 kV Line No. 1 & No. 2 to CHAIYAPHUM 2 Substation
- Two (2) feeders for 500 kV Line No. 1 & No. 2 to UBON RATCHATHANI 3 Substation

#### **Schedule 2 : 230 kV NAKHON RATCHASIMA 4 substation (GIS)**

The new 230 kV substation shall consist of 230 kV indoor GIS and the bus arrangement shall be Breaker and a half, which consists of six (6) feeders as follows:

- Two (2) feeders for 230 kV Line No. 1 & No. 2 to NAKHON RATCHASIMA 3 Substation
- Two (2) feeders for 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer “KT1A&KT2A”
- Two (2) feeders for 230 kV Line No. 1 & No. 2 to STATCOM

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

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

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

## **ELECTRICAL PART**

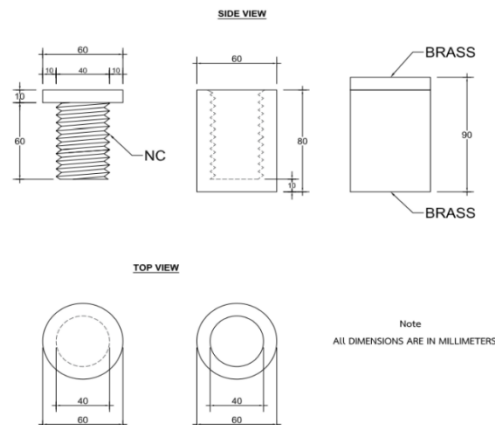
### **Schedule 1 and 2 : 500/230 kV NAKHON RATCHASIMA 4 Substation (GIS)**

#### **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:

#### **1. 500/230 kV Gas Insulated Substation (GIS)**

- 1.1 Design, supply and installation of equipment and miscellaneous hardware required for a complete 500 kV substation with GIS.
- 1.2 Design, supply and installation of equipment and miscellaneous hardware required for a complete 230 kV substation with GIS.
- 1.3 Design supply and installation of equipment and miscellaneous hardware required for a complete 22 kV power supply system.
- 1.4 Design, supply and installation of equipment required for a complete 22 kV/400 V power supply system, including all related equipment, raceway for complete operation.
- 1.5 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.
- 1.6 The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.
- 1.7 The marking pins for referenced positions from the main bus shall be provided in the GIS building. The positions of the marking pins shall be shown on the drawings for future GIS extension, and the quantity shall not be less than 4 sets per each GIS building. The marking pins shall be made of brass or stainless steel.



- 1.8 The detachable walkway (catwalk), removable service platform, and removable ladder for GIS visual protective inspection shall be provided and properly installed on each GIS module. The drawings of these walkways, platforms, and ladders installed with the GIS shall be submitted to EGAT.

EGAT reserves the right to request additional detachable walkways (catwalks), removable service platforms, and removable ladders for GIS visual protective inspection from your provided equipment if deemed necessary. The Contractor shall not consider this as additional cost and time to EGAT.

- 1.9 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 installation team. The color of the nameplates shall conform to Dwg. No. SE-ID-8-01. Their sizes and locations shall be appropriate for GIS module. EGAT reserves the right to request more details and clarification if deemed necessary.

- 1.10 The contractor shall supply identification plates for the both indoor and outdoor substation. The material, size and color shall conform to Dwg. No. SE-ID-8-01 and SE-ID-0-01, except size of GIS identification plates shall be proposed by the contractor and approved by EGAT. EGAT reserves the right to request more details and clarification if deemed necessary.

- 1.11 Design, supply and installation of miscellaneous hardware required for the following:

1.11.1 The connection of 500 kV GIS air bushings to

- Two (2) feeders for 500 kV Line No. 1 & No. 2 to WANG NOI Substation
- Two (2) feeders for 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer “KT1A&KT2A”
- Two (2) feeders for 500 kV Line No. 1 & No. 2 to CHAIYAPHUM 2 Substation
- Two (2) feeders for 500 kV Line No. 1 & No. 2 to UBON RATCHATHANI 3 Substation
- 500 kV overhead lines

1.11.2 The connection of 500 kV overhead lines to 110 Mvar, 525 kV Shunt Reactors (SR1A & SR2A, SR3A, SR4A)

1.11.3 The connection of 110 Mvar, 525 kV Shunt Reactors (SR1A, SR2A, SR3A, SR4A) to their Neutral Reactors (SR1B, SR2B, SR3B, SR4B).

1.11.4 The connection of 230 kV GIS air bushings to

- Two (2) feeders for 230 kV Line No. 1 & No. 2 to NAKHON RATCHASIMA 3 Substation
- Two (2) feeders for 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer “KT1A&KT2A”
- Two (2) feeders for 230 kV Line No. 1 & No. 2 to STATCOM
- 230 kV overhead lines

1.11.5 The connection between 500 kV and 230 kV Substation

1.12 Sag and tension of phase wires and overhead ground wires shall be designed and calculated by Contractor. The calculation shall be based on internationally-accepted standards. The said calculation shall be submitted to EGAT for approval.

## **2. Grounding system**

2.1 The Contractor’s scope of work comprises the following:

Design, supply and installation of the new ground grid and grounding system of the following:

- 500 kV substation (including grounding connection for all equipment, facilities, and steel structures)
- 230 kV substation (including grounding connection for all equipment, facilities, and steel structures)
- 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer “KT1A&KT2A”
- 110 Mvar, 525 kV Shunt Reactors (SR1A, SR2A, SR3A, SR4A) and their Neutral Reactors (SR1B, SR2B, SR3B, SR4B).
- Control building
- 500 kV GIS building
- 230 kV GIS building
- Fire pump house
- Foam house
- Water tank
- Guard house
- Communication tower (WSA)

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

2.3 The Contractor shall conduct soil resistivity measurement. Based on the measured soil resistivity, the Contractor shall evaluate/design the ground grid by hand calculation using the equations in IEEE-80 standard, and submit the calculation report to EGAT for Approval. The parameters for the calculation are as follows:

- Fault current division factor ( $S_f$ ) value = 1
- Fault current = 50 kA or recommended by EGAT during Approval
- Fault clearing time ( $t_f$ ) = 1 second or recommended by EGAT during Approval
- The grounding conductor spacing for the grounding grid of the 500/230 kV substations shall be 5.00 m. ( $D_0$ )
- The total number of ground rods for the 500/230 kV substations shall be 400 pieces.

The Contractor shall determine the size of grounding conductors for the substation grounding system and select the number of 4/0 AWG bare copper wires accordingly.

The price of the new ground grid in the new area evaluated based on the given parameters above shall be a price reference when considering the extra work or deducted work.

- If the grounding conductor spacing obtained by hand calculation, i.e.  $D_1$  is smaller than  $D_0$ , the Contractor shall design a grounding grid using the software. The software shall be certified to be acceptable for commercial use.

2.4 The Contractor shall perform ground resistance measurement after the completion of grounding system installation. Prior to the measurement, the overhead ground wire shall be disconnected from the substation. The method of measurement shall follow IEEE 81-2012 standard “IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System” or the latest version. The result shall be submitted to EGAT for Approval.

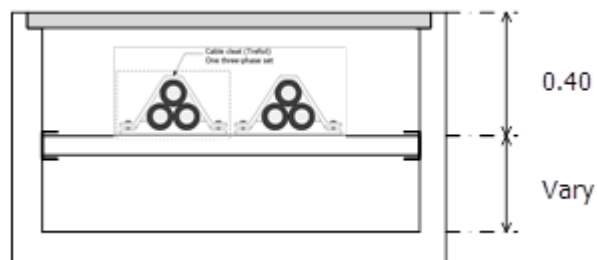
2.5 Design, supply and installation of the grounding system of the isolating transformer. The grounding system of the isolating transformer shall be separated from substation grounding system.

### 3. XLPE Cable System (Medium voltage)

22 kV XLPE Cable System (Connection from tertiary side of Auto-transformer to Station service transformer)

3.1 Design, supply and installation of 22 kV XLPE cable system complete from the 22 kV buses at the 22 kV side of the Auto-Transformer “KT1A&KT2A” to the Station service transformers KW1A and KW2A

- The design and calculation of the 22 kV XLPE cable system shall conform to IEC and/or IEEE standards.
- The 22 kV XLPE cable shall be 1/C-35 sq.mm single-core with copper conductor.
- The 22 kV XLPE cable shall be installed in trefoil formation as shown in the figure below (for example).



- The bending radius of the XLPE cable shall be checked by Contractor for the XLPE cable installation and cable trench design.
- The cable trench for 22 kV XLPE cable system shall be with metallic trench covers.
- Ampacity calculation report to be submitted for approval:
- The Contractor shall design the 22 kV cable system such that one (1) 1/C-35 sq.mm XLPE cable shall be able to carry the continuous current no less than 50 A given that the ambient temperature is not less than 45°C and at least the following cases shall be carried out for a comparative study.
  - In open air with the effect of solar heat
  - In trough without the effect of solar heat
  - EGAT may request additional cases to be carried out if deemed necessary. The Contractor shall not consider this as additional cost and time to EGAT.
- The calculation shall conform to IEC standard. The other parameters used in the design shall be practical, reasonable, and operational. The calculated continuous current rating shall be shown in the single-line diagram drawing.
- Sheath induced voltage calculation report to be submitted for approval:

- For the XLPE cable system with single-point bonding (if selected), the sheath induced voltage calculation report shall be submitted to EGAT for Approval. The calculation shall conform to IEEE standard. The assumptions and parameters for the calculation shall have reliable internationally-accepted supporting references.
- The report shall clearly examine the sheath induced voltage under the following cases
  - At rated current
  - At faults (at least including 3-phase, Single-line-to-ground, Double-line fault types)
  - EGAT may request additional cases to be carried out if deemed necessary. The Contractor shall not consider this as additional cost and time to EGAT.
- The sheath induced voltage under rated current shall not exceed 60 V.
- In case that the calculation result indicates that the Surge Voltage limiter (SVL) is required to protect the jacket of the cable from the overvoltage, it is the responsibility of the Contractor to design, supply, and install the SVL and all related hardware and accessories for a complete installation e.g. link boxes, disconnecting switches etc. In addition, the clarification document for the SVL rating selection, drawings for SVL installation and maintenance manual shall be provided and submitted for Approval.
- Details of sheath bonding for installation shall be provided and shown in drawings.
- EGAT reserves the right to request more details and clarification if deemed necessary.

#### **4. Lightning protection**

- 4.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) of
- 1550 kV for 500 kV substation
  - 900 kV for 230 kV substation
- shall be used for the calculation instead of Critical Flashover voltage (CFO).  
For 22 or 33 kV substation, the stroke current of 2 kA shall be used for the calculation.
- 4.2 The Lightning Protection Level (LPL) of Level 1 shall be used for the design of lightning protection system for the control building, GIS building, and switchgear building. The overhead ground wire is not permitted for the lightning protection system for the GIS building. Air terminal rods installed at the roof shall be used instead. The Contractor shall also supply and install test boxes as per bidding drawing.
- 4.3 Lightning protection system shall be designed to meet IEC, IEEE, E.I.T. standards or internationally-accepted standards.

## 5. Station service system

5.1 Design, supply and installation of the station service system complete with integral accessories to provide the complete system operation. The station service system shall mainly consist of as follows:

- 500 kVA, 22,000-400/230 V distribution transformer (KW1A)
- 500 kVA, 22,000-400/230 V distribution transformer (KW2A)
- Load Center Unit Substation (LCUS)
- 22 kV drop-out fuses
- 22 kV Load break switch
- 600 V, 800 A safety switches
- 22 kV equipment, and AC & DC distribution boards, stationary batteries, battery chargers, power cables, and all related equipment for a complete operation.

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

5.3 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 not be less than 1600 Ah. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers.

The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards.

The following factors that influence the capacity of the battery shall be used in the capacity of the battery design:

- The temperature coefficient of 1.10
- The design margin factor of 1.15
- The aging factor of 1.25

In addition, the size of the stationary battery shall be designed to support the operation of the new 500 kV GIS and 230 kV GIS as shown on the attached bidding document drawings.

The design calculation shall be submitted to EGAT for approval.

5.4 Foundation for station service transformer cable end box type 500 kVA (KW1A and KW2A) shall be design by contractor. The structure mark in design drawing is specified by DX

## **6. Telecommunication system**

- 6.1 Design, supply and installation of the telecommunication tower. 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 telecommunication tower will be installed on the ground level of substation.
- 6.2 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.

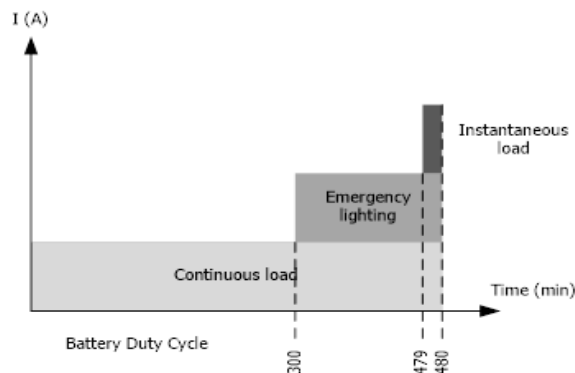
## **7. Facility system**

### **7.1 Outdoor facility system:**

- Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting, two (2) lighting relay panels, raceways, and power box (PRB) and wiring cables for lighting circuits.
- Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system of fence lighting and access road lighting shall be LED (SOLAR panel with built in battery) as per drawing no. LT-FX-0-03-01/01.
- Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system of equipment lighting shall be LED as per drawing no. LT-FX-0-02-01/01.
- Design, supply and installation of circuits for entrance gate control and a door phone system. The control of the entrance gate shall be operated by a remote switch which shall be controlled from either the guardhouse or control room.
- Design, supply and installation of circuits for the switchyard gate. The control of the switchyard gate shall be operated by both remote switch and remote control which shall be controlled from the control room.

## 7.2 Indoor facility system:

- Design, supply and installation of the buildings facility system which mainly consists of lighting system, grounding system, power supply, fire alarm and protection system, and ventilation system, air-conditioning system, and telephone & LAN system. All cable wiring systems shall conform to NEC and IEC standards or internationally-accepted standards.
- 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.
- Design, supply and installation of emergency lighting system for the Control building, 500 kV and 230 kV GIS building in case of normal station service fails with the illuminance of 150 LUX for at least 3 hours as shown in Figure below.



- All steel hardware and accessories e.g. lip-channel, conduit, conduit fitting, conduit accessories, boxes and covers shall be hot-dipped galvanized. All listed hardware and accessories shall be submitted to EGAT for approval. In cases where hot-dip galvanization is not available for certain items, clarification and approval must be obtained from EGAT before construction, without incurring additional cost and time.
- 7.3 The size of the low-voltage cable shall be adequate to ensure that the voltage drop at the load point remains less than 5% under rated load current. The voltage drop from the safety switch to the LCUS/AC board, and from the LCUS/AC board to the load, shall not exceed 2% and 3%, respectively. The voltage drop shall comply with EGAT's requirements, and the voltage drop calculation must be submitted to EGAT for approval.
- 7.4 Design, supply, and installation of the equipment and hardware required to provide the installation of the GPS antenna and FRS antenna, and their cabling connection (in metallic conduits) to the associated panels in the control room.
- 7.5 The inverter for essential load shall meet the following requirements. The Contractor shall be responsible for sizing the inverter.

No.	Description	Requirement data	Unit	No.	Description	Requirement data	Unit
1	Environmental Condition			6	Control button		
	1.1 Minimum ambient temperature	0	Celsius		6.1 Inverter START and STOP	YES	
	1.2 Maximum ambient temperature	40	Celsius		6.2 Acknowledge alarm silent	YES	
	1.3 Relative Humidity	0 – 95	%		6.3 Lamp test	YES	
	1.4 Tropicalization	YES	-	7	Measurement scale 90 degree		
	1.5 Altitude	< 1000	meters		7.1 AC output voltage class 1.5	YES	
2	Cabinet			8	Protection		
	2.1 Protection Level	IP 20			8.1 Overload shutdown	YES	
	2.2 Mounting	Removable			8.2 Low DC voltage shutdown (< 105 V)	YES	
	2.3 Epoxy painting color	RAL7032			8.3 AC output fuse to prevent short circuit current and overload	YES	
	2.4 Convection ventilation	Forced air			8.4 Overload temperature shut down	YES	
	2.5 Steel sheet thickness	1.5	mm.		8.5 Thermistor fan controlled (Inverter will shut down when temperature exceed 70 Celsius)	YES	
3	Main supply Voltage				8.6 DC circuit breaker	YES	
	3.1 Nominal Voltage	125	V.		8.7 AC circuit breaker	YES	
	3.2 Voltage variation	100 – 150	V.		8.8 DC input fuse to prevent short circuit current and overload	YES	
	3.3 Permissible ripple voltage on DC	< 5	% Vp-p	9	Monitor		
	3.4 Self-precharge	YES			9.1 Input DC voltmeter	YES	
4	Output AC Voltage				9.2 Output AC voltmeter	YES	
	4.1 Nominal voltage	220	V.	10	Alarm and LED lamp status Indicator		
	4.2 Supply system	1 ph+N			10.1 Inverter ON/OFF	YES	
	4.3 Static voltage regulation at 0-100% load variation and power factor 1.0	± 2	%		10.2 DC input status	YES	
	4.4 Dynamic voltage regulation	± 5	%		10.3 Load on inverter	YES	
	- At AC input fluctuation ± 10 %				10.4 LED lamp alarm indicators (Alarm noise shall not less than 75 db)	YES	
	4.5 harmonic distortion	< 5	% THD		10.5 AC output status (LED shall blink when Under/Over voltage +/- 10 %)	YES	
	4.6 Output frequency	50	Hz	11	Cable entry		
	4.7 Frequency variable	± 0.5	%		11.1 DC incoming	YES	
	4.8 Synchronized frequency	± 1	% Hz		11.2 AC Outgoing	YES	
5	Output capacity				11.3 Terminal	INSIDE	
	5.1 Output continuous capacity	xx	kVA				
	Note xx : Design by Contractor						
	5.2 Overload capacity 100 % continuous	YES					
	5.3 Overload capacity 125 %	10	min				
	5.4 Overload capacity 150 %	1	min				
	5.5 Efficiency at rated load and 1.0 power factor	> 85	%				

7.6 The Contractor should refer to Dwg. No. SD-CD-0-01L for guideline for facility system design of the control building.

7.7 The Contractor should refer to Dwg. No. TYP1A-GIS-9-01L and TYP1A-GIS-9-01M for guideline for facility system design of the 500 kV GIS building.

7.8 The Contractor should refer to Dwg. No. TYP1A-GIS-8-01L and TYP1A-GIS-8-01M for guideline for facility system design of the 230 kV GIS building.

## **8. Grid Connected Solar Photovoltaics (PV) Rooftop System**

8.1 The Contractor shall design, supply, deliver, install, construct, test, commission and maintain the Grid-Connected Solar PV rooftop system, which shall be completed with all necessary accessories and minor items to facilitate the correct completion of the work. All requirements of relevant standards over these works shall be applied.

The 60 kWp Solar on Grid system with string inverters shall be installed at the rooftop of control building. All the Solar PV rooftop system should be metered and the energy generated from the PV rooftop system shall be recorded.

### **8.2 General Requirement**

8.2.1 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.

8.2.2 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.

8.2.3 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.

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

- 8.2.5 The contractor or subcontractor shall have experience in executing at least two (2) contracts as the contractor for design and installation of Solar PV rooftop system in Thailand, which has the capacity of PV system more than 60 kWp, with successful operation of at least two (2) consecutive years.
- 8.2.6 Testing and commissioning of the grid-connected solar PV rooftop system shall conform to the internationally-accepted standards.
- 8.2.7 Mentoring and training to EGAT's operating staff for operation and maintenance
- 8.2.8 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. Other works**

- 9.1 Testing and commissioning of all equipment required to make the substation function properly.
- 9.2 Modification of Junction box supporting structure (JB001) for the installation of the 600 V, 800 A safety switches.
- 9.3 Modification of Junction box supporting structure (JB003) for the installation of Outdoor receptacle box (ORB1 and ORB2) and Common control cubicle for maintenance (CCM).
- 9.4 Installation of suspension and post insulators and all hardware for suspension and post insulator assembly.
- 9.5 Supply and installation of the cabling work from the transformers to control cable cubical (CCC) and the associated equipment.
- 9.6 Design, supply, and installation of identification plates for all equipment and other necessary plates.
- 9.7 Design, supply, and installation of identification plates for 3-1x333.33 MVA, 500/230-22 kV Auto-Transformer (KT1A&KT2A) and 55 Mvar, 525 kV Shunt Reactors (SR1A, SR2A, SR3A, SR4A) and their Neutral Reactors (SR1B, SR2B, SR3B, SR4B).
- 9.8 Supply and installation of the labels or signs for indication the low voltage underground cable routes in case of the low voltage cables installed by direct burial method or run in conduit method.

9.9 Modification of 22 kV bus support structure (BS203) for the installation of 22 kV Power fuse (2291F(A), 2291F(B), 22 kV current transformer (QW1A, QW2A) and 22 kV voltage transformer (VW1A, VW2A), and their junction boxes.

9.10 Modification of 22 kV Metering structure (MS402) for installation of 22 kV XLPE cables, Cable cleat, 22 kV cable terminations, 22 kV surge arresters, 22 kV power fuses, as indicated in Bidding documents.

9.11 Modification of junction box supporting structure (JB001) for the installation of power box (PRB-1)

9.12 Modification of junction box supporting structure (JB003) for the installation of power box (PRB-2)

### **Work not included in this Contract**

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

1. The stringing work for the connection between the 500 kV take-off structures and the dead-end towers of the transmission lines.
2. The stringing work for the connection between the 230 kV take-off structures and the dead-end towers of the transmission lines.
3. The stringing work for the connection between the 230 kV take-off structures to STATCOM area.
4. Supply and installation of 500/230-22 kV autotransformers (KT1A&KT2A) except cabling from the common control cubicle for auto-transformer (CCC) to the associated equipment
5. Supply and installation of 500 kV Shunt Reactor and their neutral reactor (if any), except cabling from the control cubicle for Shunt Reactor to the associated equipment
6. Supply of suspension insulators and post insulators

## **CONTROL AND PROTECTION PART**

### **Schedule 1 : 500 kV NAKHON RATCHASIMA 4 Substation (GIS)**

#### **Work included in this Contract**

1. Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Swing rack type protective relay switchboards
  - Transducer panel and Interposing relay panels
  - Marshalling panels for the remote terminal unit
  - Marshalling panel for the fault recording system
  - Marshalling panels for the control system
  - Marshalling panel for the tele-protection
  - Synchronizing panels
  - Fault recording system
  - Interposing panel
  - Trip circuit supervision panels
  - Control switching device (CSD)
  - Local control cubicle (LCC)
  - 400/230 VAC, 125 VDC power panel and 125 VDC Power distribution boards.
  - Cables and accessories as well as connection of cables among all of the boards and the associated equipment in order to complete the function of the control and protection system.
  - The interlock between the ground switch of a bus bar and the disconnecting switch that connects to the bus bar.
  
2. Design, installation, interfacing, test and commissioning of GPS receiver, outdoor antenna and Ethernet Switch with protection equipment, metering equipment and RTUs. Other accessories for interfacing form GPS to the equipment are supplied by contractor.

3. Design, installation, wiring, test and commissioning of Remote Terminal Units (RTUs) and EGAT CCS/RTU Operator Console which are supplied by EGAT. The configuration which is included in this Contract shall be fulfilled by the Contractor under EGAT's supervision. Cable and accessories for interfacing are supplied by Contractor.
4. Installation of the application software database, control function and display for the Computerized Control System, whereas the application software is supplied by EGAT. The installation shall be done by contractor under EGAT's supervision.
5. The Contractor shall be responsible for providing complete schematic, wiring diagrams including I/O list of RTU and FRS of the control and protection system.
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.

**Work not included in this Contract**

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

## **Schedule 2 : 230 kV NAKHON RATCHASIMA 4 Substation (GIS)**

### **Work included in this Contract**

1. Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises at least the following equipment:
  - Swing-rack type protective relay switchboards
  - Transducer panels
  - Interposing relay panels
  - Synchronizing panel
  - Marshalling panels for the remote terminal unit
  - Marshalling panels for the fault recording system
  - Marshalling panels for the control system
  - Marshalling panels for the tele-protection
  - Fault Recording System
  - 19" Rack type panel
  - 400/230 VAC, 125 VDC power panel and distribution boards
  - Cable and accessories as well as connection of cables among all of panels and the associated equipment in order to complete the function of the control and protection system.
2. Design, installation, wiring, test and commissioning of Remote Terminal Units (RTUs) and EGAT CCS/RTU Operator Console which are supplied by EGAT. The configuration which is included in this Contract shall be fulfilled by the Contractor under EGAT's supervision. Cable and accessories for interfacing are supplied by Contractor.
3. Installation of the application software, database, control function and display for the Computerized Control System whereas the application software is supplied by EGAT. The installation shall be done by contractor under EGAT's supervision.
4. The Contractor shall be responsible for providing complete schematic and wiring diagrams including I/O list of RTU and FRS of the control and protection system.
5. 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.

### **Work not included in this Contract**

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

## **COMMUNICATION PART**

### **Schedule 2 : 230 KV NAKHON RATCHASIMA 4 Substation (GIS)**

#### **Work included in this Contract**

##### **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 : 500 kV NAKHON RATCHASIMA 4 Substation (GIS)**

#### **Work included in this Contract**

#### **ARCHITECTURAL WORK**

##### 1. Design and construction of

##### 1.1 500 kV GIS Building.

1.1.1 Architecture of the whole building.

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

1.1.3 500 kV GIS Building shall be designed with reference to Dwg.No.SD-GIS-9-02A. The size of the building, equipment layouts and cable block out shall conform to electrical drawing Dwg.No.SE-GIS-0-01 01/01, Dwg.No.NR4-S-2 and Dwg.No. TYP1A-S-6 02/03. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.

1.1.4 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.

1.1.5 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.

1.1.6 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.

##### 1.1.7 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Storm water drainage system.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
- Overhead traveling crane, of lifting capacity not less than 10 metric tons and wireless crane remote control. Overhead traveling crane shall have cat-walk for maintenance the equipment on ceiling and complete with 2 sides of guard rail along the cat-walk.

- Overhead traveling crane shall comply with standard DIN EN 15011 standard.
- Overhead traveling crane motors shall be dual speed or inverter and have operation speed as below.

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

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

## 1.2 3D Animation

### 1.2.1 3D Animation Requirement

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

## 1.2.2 3D Animation Video Specification

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

## 2. Construction of

### 2.1 500/230 kV Control Building.

2.1.1 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.

#### 2.1.2 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
- Furniture as specified in architectural Drawings.
- Signboard on building and room name sign on each room.
- Lightning protection system.
- Emergency lighting system.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- The guarantee of the access floor system shall be 10 years guarantee of material and 5 years guarantee of installation. Therefore, the guarantee of the access floor system which was specified in the architectural drawing shall be cancelled.

## WATER SUPPLY AND FIRE PROTECTION SYSTEM

### 1. Design and construction of

#### 1.1 Fire protection system for 500 kV GIS Building.

1.1.1 GIS area shall consist of optical beam smoke detector.

1.1.2 Main cable trench of GIS Building shall consist of linear heat detector.

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

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

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

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

#### 1.2 Fire protection system for 500/230 kV 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 500/230 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.

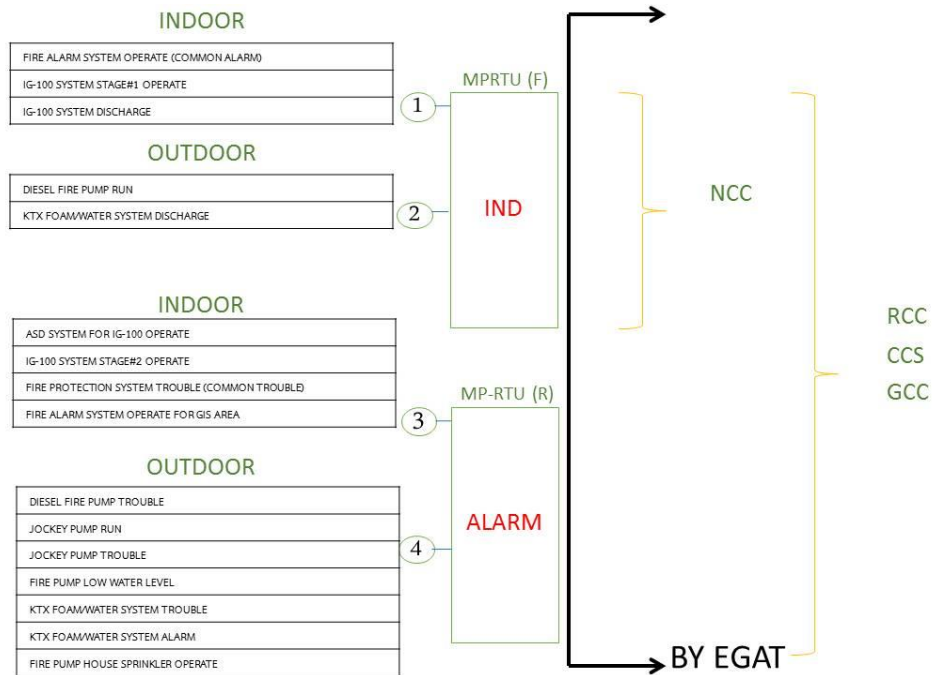
1.2.3 There shall be sounder and beacon on the roof of the building.

1.2.4 For system requirements for indoor fire protection system, 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 / heat detector and a zone C of all ASD shall be crossed or two zone of A and B are crossed.

- 1.2.5 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.
  - NFPA76 : 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.
- 1.2.6 There shall be one control panel which controls fire detection system and IG-100 fire suppression system in the building.
- 1.2.7 For all zones of IG-100 protected zone shall have disconnect switch for maintenance.
- 1.2.8 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 the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.
- 1.4 Fire protection system for the Transformer /Shunt Reactor: The Foam-water spray system shall comply with the following;
- 1.4.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850
  - 1.4.2 Foam concentrate shall be non-fluorine type.
  - 1.4.3 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.
  - 1.4.4 Nozzles : NFPA 16 and as per Manufacturer's Recommendation
  - 1.4.5 Detection system : Air Expansion Linear Heat Detection System (LHB)
  - 1.4.6 Equipment for system : FM approved, UL Listings , Vds

- 1.4.7 Foam-water spray system provided for Transformer/ Shunt Reactor shall be designed for a minimum density of 10.2 litre/min-sq.m over the exposed surface at the Transformer/ Shunt Reactor.
- 1.4.8 There shall be one linear heat detector box for each transformer / shunt reactor.
- 1.4.9 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.
- 1.4.10 Each transformer/shunt reactor shall have disconnect switches for maintenance.
- 1.5 Fire Pump System. (conforming to NFPA 14, 20, 22, 24, 72).
- 1.6 Water storage tank for fire protection system (capacity not less than 350 cu.m) shall be conformed to NFPA22 and install water level sight glass or visual water level indicator and galvanized steel pipe guard rail at the top of tank shall be at less 90 cm. The contractor shall submit design drawing and calculation to EGAT for approval.
- 1.7 350 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 together with graphic annunciator in 500/230 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 locates.
- 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 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;



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

1.13 Water supply system.

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

1.15 Portable fire extinguisher

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

1.17 Contractor shall warranty the fire protection system for two full years 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.

- 1.18 Notwithstanding the expiration of any warranty period described in this contract, the warranty period for any fire protection system or equipment and maintenance period shall be extended by a period equal to the sum of any periods during the warranty period when such system or equipment cannot be used for the purposes for which they were intended or the delays in maintenance, starting from the date EGAT has given contractor notice.
- 1.19 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24" LED monitor which show the status of fire protection system in control room in 500/230 kV Control Building. One set of laser jet printer shall be provided.
- 1.20 Consumable materials and backup batteries for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.
- 1.21 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards. The installer shall be certified by manufacturer and have experience in installation of material for at least 5 years, of at least 10 projects.
- 1.22 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 with galvanized steel frame 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.

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, Storage room and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Tunnels, Cable Spreading Area	<ul style="list-style-type: none"> <li>▪ SD when environmental condition is acceptable.</li> <li>▪ LHD when environmental condition is out of range for SD</li> <li>▪ ASD in high risk area and required early response.</li> </ul>
12. Main Cable Trench of GIS Area	LHD
13. Warehouse	OBSD
14. Cable room	ASD and SD

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 There shall be stainless steel flexible connector for fire fighting pipe and foam solution pipe when penetrating through buildings' wall. The flexible joint axial movement shall not less than 5 cm.
- 1.29 The contractor shall provide extra dry contacts of fire pump system signals for future expansion of substation.
- 1.30 There shall be weather proof type linear heat detector (cable type) system with the approval of UL and/or FM and/or VDS standard for rooftop solar PV system of each building. The system shall send signal of fire alarm to EGAT's RTU and fire protection control panel together with graphic annunciator of each building.
- 1.31 There shall be insect screen for all louver of fire pump house and foam house.
- 1.32 The roller shutter door of fire pump house and foam house shall be Rolling Shutter Door with Solid Blades
- 1.33 There shall be sunshade for outdoor equipment of deluge system.

## 2. Construction of

- 2.1 Foam house.
- 2.2 Fire pump house.
- 2.3 Cabinets with 2x50 lbs wheel fire extinguisher

## CIVIL WORK

### 1. Design and construction of

#### 1.1 500 kV GIS Building

1.1.1 The design of structure & foundation shall be submitted to EGAT for approval.

1.1.2 The main conceptual design of the structure shall consist of:

- R.C. Structure shall be built from the foundation to GIS floor; and
- Pre-engineered building (PEB) steel structure (bolts connection system) above the GIS Floor shall be provided with the fire protection to conform with legal provisions.

1.1.3 The roof steel structure shall be applied with a fireproof paint system with a minimum fire-resistant rate of one (1) hour, in accordance with the legal requirement.

1.1.4 The 500 kV GIS Building structure shall be designed with reference to Dwg.No.SD-GIS-9-02A, The equipment layouts and cable block out shall be in conformity with electrical drawing Dwg.No.NR4-S-2 and Dwg. No. TYP1A-S-6 02/03.

1.1.5 The contractor shall be design and construct the 500kV GIS structure with all applicable requirements pertaining to the building's Electrical, Architectural, Sanitary and Fire protection systems.

1.2 Steel structure and foundations for Specified equipment and the others not shown in "For Construction drawings" and / or EGAT's specification.

1.2.1 500 kV GIB structure and foundation.

1.2.2 Common Control Cabinet foundation.

1.2.3 Circuit breaker marshalling kiosk foundation.

1.2.4 Load break switch structure foundation

1.2.5 Cable trench 1.80 m width

1.3 Road and drainage system.

1.4 Drainage system for cable trench.

1.5 Oil separator (volume of oil 85cu.m.). The contractor shall make an Oil separator design calculation in accordance with "IEEE STD-979-1994 (R2004)" (IEEE Guide for Substation Fire Protection), "IEEE STD-980-1994 (R2001)" (IEEE Guide for containment and control of oil spills in substation) and "Wastewater Quality Standard" of Pollution Control Department, Ministry of Natural Resources and Environment.

1.6 Remote control (shall be controlled from either the control room or the guard house) and door phone system for main entrance gate.

2. Construction of
  - 2.1 Telecommunication tower foundation.
  - 2.2 Steel structure foundation.
  - 2.3 Take-off foundation.
  - 2.4 Equipment structure foundation with sub trench (if required).
  - 2.5 Transformer loading.
  - 2.6 Cable trench.
  - 2.7 RC. Road.
  - 2.8 Oil separator.
  - 2.9 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
  - 2.10 Crushed rock surfacing.
  - 2.11 Wire mesh fence.
  - 2.12 Main entrance gate 8.00 m width (sliding).
  - 2.13 Signboard structure and foundation.
  - 2.14 Site office.
  - 2.15 Garage house
  - 2.16 Lamp post for fence and access road lighting LED type foundation.
3. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
4. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
5. All design, construction and testing shall be in accordance with Specification No.3001: Civil and Architectural Work.
6. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
7. EGAT's Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.
8. EGAT's Soil Investigation Report (attached to the Contract) which was conducted prior to the site preparation work is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.

9. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
10. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
11. The Contractor shall perform a static load test for 500kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
12. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
13. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
14. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval. (if pad type foundation is required).
15. 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.
16. According to the Contract Document Section G-3 : Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows : the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sqm for office area, 24 sqm for conference room which shall both be air-conditioned and 4 sqm for toilet. The Contractor shall supply two (2) sets of facilities specified in section G-3, please ensure that each item is provided in double quantity (e.g., six sets of desks and chairs, two refrigerator)

## **SOLAR ROOFTOP SYSTEM**

### **1. Design and construction of**

#### **1.1 The solar rooftop system for 500/230 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.

### **Work not included in this Contract.**

- Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4)

## **Schedule 2 : 230 kV NAKHON RATCHASIMA 4 Substation (GIS)**

### **Work included in this Contract**

#### **ARCHITECTURAL WORK**

##### 1. Design and construction of

###### 1.1 230 kV GIS Building.

1.1.1 Architecture of the whole building.

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

1.1.3 230 kV GIS Building shall be designed with reference to Dwg.No.SD-GIS-8-02A. The size of the building, equipment layouts and cable block out shall conform to electrical drawing Dwg.No.SE-GIS-0-01 01/01, Dwg.No.NR4-S-2 and Dwg. No. TYP1A-S-6 03/03. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.

1.1.4 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.

1.1.5 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.

1.1.6 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.

###### 1.1.7 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Storm water drainage system.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.

- Overhead traveling crane, of lifting capacity not less than 7.5 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	<b>0.8 m/min</b>

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

## **WATER SUPPLY AND FIRE PROTECTION SYSTEM**

### 1. Design and construction of

#### 1.1 Fire protection system for 230 kV GIS Building.

1.1.1 GIS area shall consist of optical beam smoke detector.

1.1.2 Main cable trench of GIS Building shall consist of linear heat detector.

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

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

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

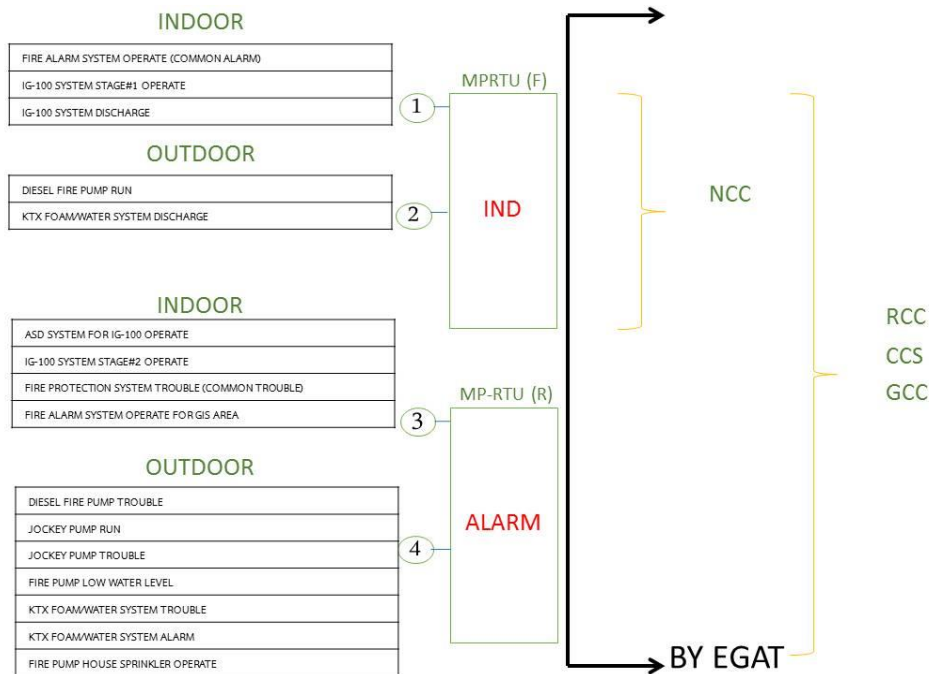
- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA 76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA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

1.2 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.

1.3 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.

1.4 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.

1.5 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 event 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;



- 1.6 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 1.7 Water supply system.
- 1.8 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 1.9 Portable fire extinguisher
- 1.10 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 1.11 Contractor shall warranty the fire protection system for two full years 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.
- 1.12 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.
- 1.13 Consumable materials and backup batteries for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.

1.14 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.

1.15 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 with galvanized steel frame 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.

1.16 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, Storage room and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Tunnels, Cable Spreading Area	<ul style="list-style-type: none"> <li>▪ SD when environmental condition is acceptable.</li> <li>▪ LHD when environmental condition is out of range for SD</li> <li>▪ ASD in high risk area and required early response.</li> </ul>
12. Main Cable Trench of GIS Area	LHD
13. Warehouse	OBSD
14. Cable room	ASD and SD

## 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

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

1.18 Underground water piping shall have indicator sign.

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

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

## 2. Construction of

2.1 Cabinets with 2x50 lbs wheel fire extinguisher.

2.2 Underground water tank 50 cu.m.

## **CIVIL WORK**

### 1. Design and construction of

#### 1.1 230 kV GIS Building

1.1.1 The design of structure & foundation shall be submitted to EGAT for approval.

1.1.2 The main conceptual design of the structure shall consist of:

- R.C. Structure shall be built from the foundation to GIS floor; and
- Pre-engineered building (PEB) steel structure (bolts connection system) above the GIS Floor shall be provided with the fire protection to conform with legal provisions.

1.1.3 The roof steel structure shall be applied with a fireproof paint system with a minimum fire-resistant rate of one (1) hour, in accordance with the legal requirement.

1.1.4 The 230 kV GIS Building structure shall be designed with reference to Dwg.No.SD-GIS-8-02A, The equipment layouts and cable block out shall be in conformity with electrical drawing Dwg.No.NR4-S-2 and Dwg. No. TYP1A-S-6 03/03.

1.1.5 The contractor shall be design and construct the 230 kV GIS structure with all applicable requirements pertaining to the building's Electrical, Architectural, Sanitary and Fire protection systems.

- 1.2 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
  - 1.2.1 230 kV GIB & GIS bushing structure and foundation.
  - 1.2.2 Cable trench 1.80 m width
- 1.3 Road and drainage system.
- 1.4 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 Lamp post for fence and access road lighting LED type foundation.
3. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
4. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
5. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.
6. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.
7. EGAT’s Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.
8. EGAT’s Soil Investigation Report (attached to the Contract) which was conducted prior to the site preparation work is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.

9. In case of soil layer is soft clay, consolidation test shall be performed from clay of one bored hole only. The position shall be submitted to EGAT for approval.
10. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
11. The Contractor shall perform a static load test for 230 kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
12. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
13. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
14. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval. (if pad type foundation is required).
15. 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.

**Work not included in this Contract.**

- Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4)

## **2. 500 KV CHAIYAPHUM 2 SUBSTATION (GIS)**

### **GENERAL**

The existing 500/230 kV Chaiyaphum 2 Substation is gas-insulated switchgear (GIS) type, located in Tambon Phon Thong, Amphur Mueang and Chaiyaphum Province.

### **Schedule 3 : 500 kV CHAIYAPHUM 2 substation (GIS)**

1. Design, supply and complete the extension of new 500 kV transmission lines as follows:
  - 500 kV Line No. 1 to Nakhon Ratchasima 4 with 110 Mvar, 500 kV Shunt reactor and 0.55 Mvar, 110 kV Neutral reactor.
  - 500 kV Line No. 2 to Nakhon Ratchasima 4 with 110 Mvar, 500 kV Shunt reactor and 0.55 Mvar, 110 kV Neutral reactor.
2. Design, supply, replace, and complete the installation of identification plates as outlined in the drawing.

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

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

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

## **ELECTRICAL PART**

### **Schedule 3 : 500 kV CHAIYAPHUM 2 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:

#### **1. 500 kV substation**

- 1.1 Design, supply and installation of equipment and miscellaneous hardware required for a complete 500 kV substation.
- 1.2 The contractor shall supply identification plates for the outdoor substation. The material, size and color shall conform to Dwg. No. SE-ID-8-01 and SE-ID-0-01.
- 1.3 Design, supply and installation of miscellaneous hardware for:
  - The connection from the 500 kV GIS air bushings to 500 kV overhead lines with 500 kV Shunt reactor and 110 kV Neutral reactor installation.
  - The grounding equipment and miscellaneous hardware for 500 kV Shunt reactor and 110 kV Neutral reactor.

#### **2. Grounding system**

- 2.1 Design, supply and installation of the new ground grid and grounding system of the 500 kV substation (including grounding connection for all equipment, facilities, structures within).
- 2.2 Design, supply and installation of the grounding equipment and miscellaneous hardware. The type of grounding conductor for the substation grounding system shall be 4/0 AWG bare copper wire.

#### **3. Facility system**

- 3.1 Outdoor facility system:
  - Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system of equipment lighting shall be LED as per drawing no. LT-FX-0-02-01/01.
  - The additional lighting equipment shall be connected to the existing lighting relay panel (LRP1) and shall consist of two categories, as shown in drawing no. CYP2-L-1-01/01.

#### **4. Other work**

- 4.1 Relocation and installation of the existing 500 kV Disconnecting switch (90321A&90321AG and 90411A&90411AG). Details of relocation are shown on the bidding document drawings.
- 4.2 Testing and commissioning of all equipment required to make the substation function properly.
- 4.3 Installation of suspension and post insulators and all hardware for suspension and post insulator assembly.

#### **Work not included in this Contract**

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

1. The stringing work for the connection between the 500 kV take-off structures and the dead-end towers of the transmission lines.
2. Supply and installation of 500 kV Shunt reactor (SR1A, SR2A) and 145 kV Neutral reactor (SR1B, SR2B), except cabling from the control cubicle for Shunt Reactor to the associated equipment
3. Supply of suspension insulators and post insulators.

## **CONTROL AND PROTECTION PART**

### **Schedule 3 : 500 kV CHAIYAPHUM 2 Substation (GIS)**

#### **Work included in this Contract**

1. Design, supply, installation, wiring, test and commissioning of complete control and protection system which comprises at least the following equipment.
  - Swing rack type switchboard panels
  - Loose equipment as specified in price schedule
  - Related accessory equipment which is required for interfacing between the existing equipment and new equipment.
  - Cable and accessories as well as connection of cables among all the new equipment, the existing panels and the associated equipment in order to complete the function of the control and protection system
2. Design, modification, wiring, test and commissioning of the existing control and protection system in order to incorporate the equipment according to EGAT's requirement which comprises of at least the following equipment and work:
  - Swing rack type switchboard panels
  - Interposing relay panel
  - Marshalling panel for remote terminal unit
  - Marshalling panel for fault recording system
  - Marshalling panel for control
  - Marshalling panel for tele-protection
  - Remote terminal unit (RTU)
  - Fault recording system (FRS)
  - GPS receiver and Ethernet switch panel
  - 400/230 VAC and 125 VDC distribution boards
  - Other related panels
  - Cables and accessories as well as connection of cables among all of the boards, primary equipment and the associated equipment in order to complete the function of the control and protection system

3. Design of the schematic and wiring diagram of the additional and replacement inputs to the Computerized Control System (CCS), including test and commissioning of the complete CCS. Providing completed EGAT RTU I/O List in both hardcopy and electronic file.
4. Design of the schematic and wiring diagrams of the additional and replacement inputs to the existing Fault Recording System (FRS), including test and commissioning of the complete FRS.
5. Any modification and interfacing work 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. The final drawings shall be submitted as ACAD files.
6. Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection systems.
7. Removal of the unused existing protection panel or unused equipment of existing control and protection panel. The removed protection panel shall be neatly kept in a suitable place recommended by EGAT.
8. Removal of the unused existing cables. The removed cable shall be neatly reeled and kept in a suitable place recommended by EGAT
9. 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 systems.

**Works not included in this Contract**

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## **CIVIL AND ARCHITECTURAL PART**

### **Schedule 3 : 500 kV CHAIYAPHUM 2 Substation (GIS)**

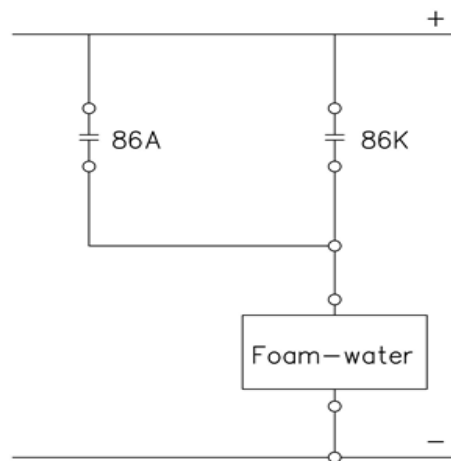
#### **Work included in this Contract**

#### **WATER SUPPLY AND FIRE PROTECTION**

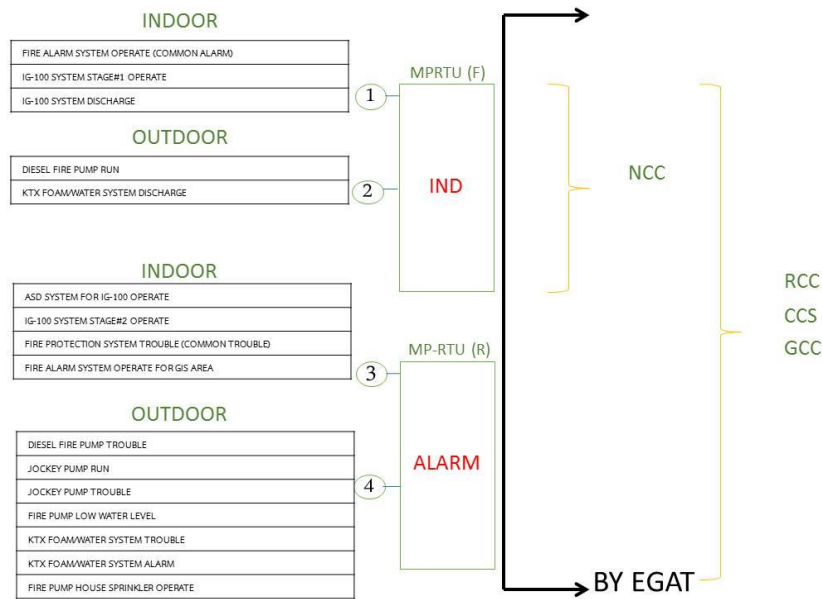
1. Design and construction of
  - 1.1 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.
  - 1.2 Fire protection system for the Shunt Reactor : The Foam-water spray system shall comply with the following;
    - 1.2.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850
    - 1.2.2 Foam concentrate shall be non-fluorine type.
    - 1.2.3 Bladder tank vessel construction standards : Carbon steel to ASME code section VIII for unfired pressure vessel.
    - 1.2.4 Nozzles : NFPA 16 and as per Manufacturer's Recommendation
    - 1.2.5 Detection system : Air Expansion Linear Heat Detection System (LHB)
    - 1.2.6 Equipment for system : FM approved, UL Listings , Vds
    - 1.2.7 Foam-water spray system provided for Shunt Reactor shall be designed for a density of 10.2 litre/min-sq.m over the exposed surface at the Shunt Reactor.
    - 1.2.8 There shall be one linear heat detector box for each shunt reactor.
    - 1.2.9 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.
    - 1.2.10 The new control panel shall be IP55.
    - 1.2.11 Each shunt reactor shall have disconnect switches for maintenance.
  - 1.3 Fire protection system of warehouse Building 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 together with graphic annunciator in 500 kV Control and GIS Building. The installation practice shall be in accordance with the latest edition of NFPA 72.
  - 1.4 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (fire pump houses, transformers, shunt reactors) at the building where control room locates.

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

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



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



- 1.8 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 1.9 Contractor shall warranty the fire protection system for two full years 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.
- 1.10 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.
- 1.11 Consumable materials and backup batteries for fire protection system, for example, filters, liquids and seals shall be provided according to manufacturer's instructions for a period of two years.
- 1.12 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1
- 1.13 Underground water piping shall have indicator sign.
- 1.14 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code)
- 1.15 All junction boxes or electrical equipment in rooms on ground floor shall be 1.2 m higher from room floor elevation.
- 1.16 There shall be stainless steel flexible connector for fire fighting pipe and foam solution pipe when penetrating through buildings' wall. The flexible joint axial movement shall not less than 5 cm.

1.17 The contractor shall provide extra dry contacts of fire pump system signals for future expansion of substation.

1.18 There shall be sunshade for outdoor equipment of deluge system.

## **CIVIL WORK**

1. Construction of
  - 1.1 Steel structure foundation.
  - 1.2 Equipment structure foundation with sub trench (if required).
2. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
3. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
4. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.
5. EGAT's Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.
6. EGAT's Soil Investigation Report (attached to the Contract) which was conducted prior to the site preparation work 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.
7. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
8. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
9. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
10. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval. (if pad type foundation is required).
11. 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.

### **Work not included in this Contract.**

- Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4)

### **3. 230 KV NAKHON RATCHASIMA 3 SUBSTATION**

#### **GENERAL**

Nakhon Ratchasima 3 substation is existing 230/115 kV Air Insulated Substation (AIS) located in Nakhon Ratchasima Province. The substation will be extended as outlined in the drawings to accommodate new 230 kV transmission lines.

#### **Schedule 4 : 230 KV NAKHON RATCHASIMA 3 substation**

The existing 230 kV substation will be extended as outlined as follows:

- One (1) feeder for 230 kV line No.1 to Nakhon Ratchasima 4
- One (1) feeder for 230 kV line No.2 to Nakhon Ratchasima 4

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

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

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

## **ELECTRICAL PART**

### **Schedule 4 : 230 KV NAKHON RATCHASIMA 3 substation**

#### **Work included in this Contract**

The Work included in this Contract to be performed by the Contractor shall be as specified in the Contract Documents and as follows:

#### **1. 230 kV substation**

- 1.1 Design, supply and installation of equipment and miscellaneous hardware required for extended 230 kV substation as outlined in the drawings to accommodate new two (2) 230 kV transmission lines.
- 1.2 The contractor shall supply identification plates for the both indoor and outdoor substation. The material, size and color shall conform to Dwg. No. SE-ID-7-01, SE-ID-8-01 and SE-ID-0-01. EGAT reserves the right to request more details and clarification if deemed necessary.
- 1.3 Design, supply and installation of miscellaneous hardware for connecting between existing 230 kV substation and extended substation.
- 1.4 Sag and tension of phase wires and overhead ground wires shall be designed and calculated by Contractor. The calculation shall be based on internationally-accepted standards. The said calculation shall be submitted to EGAT for approval.

#### **2. Grounding system**

- 2.1 The contractor shall design, supply and install the conductor size 2 x 4/0 AWG bare copper wire type connect from ground grid to steel structure and equipment.
- 2.2 Design, supply and installation of the grounding equipment and miscellaneous hardware. The type of grounding conductor for the substation grounding system shall be 4/0 AWG bare copper wire.

#### **3. Lightning protection**

- 3.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) of
  - 900 kV for 230 kV substationshall be used for the calculation instead of Critical Flashover voltage (CFO). For 22 or 33 kV substation, the stroke current of 2 kA shall be used for the calculation.
- 3.2 Lightning protection system shall be designed to meet IEC, IEEE, E.I.T. standards or internationally-accepted standards.

#### **4. Facility system**

##### 4.1 Outdoor facility system:

- Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system shall mainly consist of equipment lighting and wiring cables for lighting circuits.
- Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system of equipment lighting shall be LED as per drawing no. LT-FX-0-02-01/01.

##### 4.2 The size of the low-voltage cable shall be adequate to ensure that the voltage drop at the load point remains less than 5% under rated load current.

The voltage drop from the safety switch to the LCUS/AC board, and from the LCUS/AC board to the load, shall not exceed 2% and 3%, respectively.

The voltage drop shall comply with EGAT's requirements, and the voltage drop calculation must be submitted to EGAT for approval.

#### **5. Other work**

- 5.1 Testing and commissioning of all equipment required to make the substation function properly.
- 5.2 Installation of suspension and post insulators and all hardware for suspension and post insulator assembly.
- 5.3 Design, supply, and installation of identification plates for all equipment and other necessary plates.
- 5.4 Supply and installation of the labels or signs for indication the low voltage underground cable routes in case of the low voltage cables installed by direct burial method or run in conduit method.

#### **Work not included in this Contract**

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

1. The stringing work for the connection between the 230 kV take-off structures and the dead-end towers of the transmission lines.
2. Supply of suspension insulators and post insulators.

## **CONTROL AND PROTECTION PART**

### **Schedule 4 : 230 kV NAKHON RATCHASIMA 3 Substation**

#### **Work included in this Contract**

1. Design, supply, installation, wiring, test and commissioning of complete control and protection system which comprises at least the following equipment.
  - Swing rack type switchboard panels
  - E1 Converter panel
  - Fault recording system panels and marshalling panel for fault recording system
  - Loose equipment as specified in price schedule
  - Related accessory equipment which is required for interfacing between the existing equipment and new equipment.
  - Cable and accessories as well as connection of cables among all the new equipment, the existing panels and the associated equipment in order to complete the function of the control and protection system
  
2. Design, modification, wiring, test and commissioning of the existing control and protection system in order to incorporate the equipment according to EGAT's requirement which comprises of at least the following equipment and work:
  - Swing rack type switchboard panels
  - Interposing relay panel
  - Marshalling panel for remote terminal unit
  - Marshalling panel for fault recording system
  - Marshalling panel for control
  - Marshalling panel for tele-protection
  - Remote terminal unit (RTU)
  - Fault recording system (FRS)
  - GPS receiver and Ethernet switch panel
  - 400/230 VAC and 125 VDC distribution boards
  - 48 VDC distribution boards
  - Other related panels
  - Cables and accessories as well as connection of cables among all of the boards, primary equipment and the associated equipment in order to complete the function of the control and protection system

3. Design of the schematic and wiring diagram of the additional and replacement inputs to the Computerized Control System (CCS), including test and commissioning of the complete CCS. Providing completed EGAT RTU I/O List in both hardcopy and electronic file.
4. Design of the schematic and wiring diagrams of the additional and replacement inputs to the existing Fault Recording System (FRS), including test and commissioning of the complete FRS.
5. Any modification and interfacing work 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. The final drawings shall be submitted as ACAD files.
6. Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection systems.
7. Removal of the unused existing protection panel or unused equipment of existing control and protection panel. The removed protection panel shall be neatly kept in a suitable place recommended by EGAT.
8. Removal of the unused existing cables. The removed cable shall be neatly reeled and kept in a suitable place recommended by EGAT
9. 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 systems.

**Works not included in this Contract**

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## **CIVIL AND ARCHITECTURAL PART**

### **Schedule 4 : 230 kV NAKHON RATCHASIMA 3 Substation**

#### **Work included in this Contract**

##### **CIVIL WORK**

1. Construction of
  - 1.1 Steel structure foundation.
  - 1.2 Take-off foundation.
  - 1.3 Equipment structure foundation with sub trench (if required).
  - 1.4 Cable trench.
2. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
3. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
4. All design, construction and testing shall be in accordance with Specification No.3001 : Civil and Architectural Work.
5. EGAT's Soil Investigation Report shall be submitted to the Contract after award of contract. If Soil Investigation Report affects foundation design (as shown in Price Schedule), the consequent works can be additional/deductive work.
6. EGAT's Soil Investigation Report (attached to the Contract) which was conducted prior to the site preparation work 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.
7. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
8. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
9. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
10. Plate bearing test according to ASTM D1194-94 shall be submitted to EGAT for approval. (if pad type foundation is required).
11. 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.

#### **Work not included in this Contract.**

- Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4)