

## **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

Due to the outbreak of COVID-19 in Thailand, please be informed of the online payment for purchase of bidding documents as follows:

- 1) 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, Bangkrui Branch, Nonthaburi.

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

- 2) Download the Registration Form and fill out all necessary information by typing. (Complete data is required.)
- 3) Submit the fill-out Registration Form and the proof of payment from 1) to the email address of the in-charge officer and [procurement.tse@egat.co.th](mailto:procurement.tse@egat.co.th) in the CC. before 15.00 hrs. Bangkok Standard Time.
- 4) After the payment has been verified for approximately 3 working days, the in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form.

***\*\* Please note that this online payment process is a temporary measure due to the COVID-19 outbreak. The online payment process will be available until further notice from EGAT \*\****

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# Registration Form

Invitation to Bid No. TIPN-S-05

Supply and Construction of 500/230 kV Lamphun 3 (GIS) and 500 kV Mae Moh 3 (GIS) Substations  
Transmission System Improvement Project in Upper Northern Region to Enhance System Security

Available Duration for Purchasing : June 17, 2022 - July 18, 2022

Price of Bidding Documents : USD 1,000.- or THB 30,000.-

## Instructions

- 1) 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.
- 2) Fill out this Registration Form in English by typing. (Complete data is required.)
- 3) Submit the filled-out Registration Form and the proof of payment to the in-charge officer via email [pirada.s@egat.co.th](mailto:pirada.s@egat.co.th) (with cc. [procurement.tse@egat.co.th](mailto:procurement.tse@egat.co.th)) before 15.00 hrs. Bangkok Standard Time.
- 4) The in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form, which will take approximately 3 working days.

For Purchaser			TAX ID :
No.	Receipt No. :	Date :	
Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
Local Representative			
Address			
		Tax ID :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
For Procurement Officer		Change of Bidder's Name	TAX ID :
Bidder's Letter No. :		Dated :	
New Bidder's Name			
Address			
		Country :	
Name of Contact Person :		Tel.	Mobile No.
Email Address :			
<b>Contact Information of In-charge Officer</b>			
Name	Ms. Pirada Sitthithaworn		
Email address	<a href="mailto:pirada.s@egat.co.th">pirada.s@egat.co.th</a>		
Telephone No.	66 2436 3342		
Mobile No.	668 6887 9047		



Invitation to Bid No. TIPN-S-05

(Revision 2)

**Supply and Construction of 500/230 kV Lamphun 3 (GIS) and 500 kV Mae Moh 3 (GIS) Substations  
Transmission System Improvement Project in Upper Northern Region  
to Enhance System Security  
Two-Envelope (Pre-Qualification)**

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

**Place of Construction** : Lamphun 3 Substation and Mae Moh 3 Substation

**Medium Cost (including Value Added Tax and other expenses)** : THB 2,340,000,000.-

**Eligibility of Bidders**

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

**Availability of Bidding Documents**

Bidding Documents in CD-ROM will be available for examination of Bidder's Qualifications and purchase during 08:00 hrs. to 15:00 hrs., Bangkok Standard Time, as from June 17, 2022 to July 18, 2022 at USD 1,000.- or THB 30,000.- per copy, non-refundable, at the following address :

International Procurement Department - Transmission Segment  
(Room No. 301, 3<sup>rd</sup> Floor, Tor 082 Building)  
Procurement and Inventory Management Division  
Electricity Generating Authority of Thailand  
Bangkruai, Nonthaburi 11130, Thailand  
Telephone no. 66 2436 0342  
E-mail : [procurement.tse@egat.co.th](mailto:procurement.tse@egat.co.th)

Please find more details and download Registration Form for purchasing Bidding Documents at <http://www4.egat.co.th/fprocurement/biddingeng/>.

*Kannika Dhachalapat*

Payment can be made by a certified cheque or money order payable to EGAT or by a telegraphic transfer to EGAT's current 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.

Bidding Documents in CD-ROM will be either airmailed or airfreighted to the buyer at EGAT's expense upon receipt of the relevant remittance. In case the buyer requires the Bidding Documents to be sent by Express Mail Service (EMS), the charge will be at the buyer's expense.

Delivery of Bids

*Price and Technical Proposal Submission Date and Technical Proposal Opening Date is postponed from August 23, 2022 around one (1) month.*

ELECTRICITY GENERATING AUTHORITY OF THAILAND

*September 1, 2022*



(Mrs. Kannika Dhachalapat)

Chief, International Procurement Department - Transmission Segment



ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย  
เรื่อง ประกวดราคาจ้าง เลขที่ TIPN-S-05  
ประกวดราคา 2 ซอง (Pre-Qualification)

(ฉบับแก้ไข ครั้งที่ 2)

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะจัดหาและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500/230 kV ลำพูน 3 (GIS) และสถานีไฟฟ้าแรงสูง 500 kV แม่เมาะ 3 (GIS) สำหรับโครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคเหนือตอนบน เพื่อเสริมความมั่นคงระบบไฟฟ้า โดยทำสัญญาแบบปรับราคาได้ (ค่า k) โดยใช้งบประมาณ กฟผ.

**สถานที่ก่อสร้าง** : สถานีไฟฟ้าแรงสูงลำพูน 3 และสถานีไฟฟ้าแรงสูงแม่เมาะ 3

**ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ)** : 2,340,000,000.- บาท

**คุณสมบัติของผู้เสนอราคา**

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

กมลทิพย์ อธิคุณัญญ์

### การขายเอกสารประกวดราคา

ผู้สนใจติดต่อขอทราบรายละเอียด เพื่อตรวจสอบคุณสมบัติของผู้เสนอราคา และขอซื้อเอกสารประกวดราคา ในราคา ชุดละ 30,000.- บาท ได้ที่ แผนกจัดจ้างต่างประเทศสายงานระบบส่ง (ห้อง 301 ชั้น 3 อาคารฝ่ายจัดซื้อจัดจ้างและบริหารพัสดุ ท.082) กองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง ฝ่ายจัดซื้อจัดจ้างและบริหารพัสดุ การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย เชียงสะพาน พระราม 7 จังหวัดนนทบุรี ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 17 มิถุนายน 2565 ถึงวันที่ 18 กรกฎาคม 2565 หรือสอบถามทางโทรศัพท์ หมายเลข 0 2436 0342 หรืออีเมล procurement.tse@egat.co.th ทั้งนี้ สามารถ download แบบฟอร์มลงทะเบียนผู้ซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ <https://www4.egat.co.th/fprocurement/biddingeng/>

### การยื่นซองประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา และเปิดซองข้อเสนอด้านเทคนิค เลื่อนจากวันที่ 23 สิงหาคม 2565 ออกไปประมาณ 1 เดือน

ประกาศแก้ไข ณ วันที่ 1 กันยายน 2565

กมลิกา ธาตุภักดิ์

(นางกรรณิกา ธาตุภักดิ์)

หัวหน้ากองจัดซื้อจัดจ้างต่างประเทศสายงานระบบส่ง



**ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)  
ในการจัดซื้อจัดจ้างที่มีใช้งานก่อสร้าง**

**1. ชื่อโครงการ Bid No. TIPN-S-05**

งานจัดหาและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500/230 kV ลำพูน 3 (GIS)

และสถานีไฟฟ้าแรงสูง 500 kV แม่เมาะ 3 (GIS)

โครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคเหนือตอนบนเพื่อเสริมความมั่นคงระบบไฟฟ้า

/หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

**2. วงเงินงบประมาณที่ได้รับจัดสรร**

โครงการปรับปรุงระบบส่งไฟฟ้าบริเวณภาคเหนือตอนบนเพื่อเสริมความมั่นคงระบบไฟฟ้า

งบประมาณ 12,240 ล้านบาท

**3. วันที่กำหนดราคากลาง 21 เมษายน 2565 (วันที่ รวส. อนุมัติ )**

ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 2,340,000,000.00 บาท ราคา/หน่วย ตามเอกสารแนบ

**4. แหล่งที่มาของราคากลาง**

หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานระบบส่ง

**5. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง**

5.1 นายฉัตรชัย            เชาวนาธิคม                    หมฟ-ส. กวอ-ส.

5.2 นายธิติววัฒน์        เบญจวงค์รัตน์            หสภ-ส. กวอ-ส.

5.3 นายภาณุวัฒน์         ลิขิตผลผดุง                หอต-ส. กวอ-ส.

5.4 นางสาวจารุวรรณ       พิพัฒน์มงคลพร            หวอ-ส. กวอ-ส.

5.5 นายเมธา                 รักปาน                      กวป-ส.

5.6 นายสุวัฒน์            ศักดิ์สมกุลอุทัย         กวธ-ส.

5.7 นางสาวเอกอุฬาร        เทวารุทธ                    กวส-ส. อรส.

หมายเหตุ ค่าใช้จ่ายอื่นๆ ได้แก่ ค่าใช้จ่ายที่ กฟผ. ต้องจ่ายตามวิธีการพิจารณาเปรียบเทียบราคาที่กำหนดไว้

ในเอกสารประกวดราคา เช่น อากรขาเข้า เป็นต้น

*นางสาวอัสยา ช่างวิทยากร*

นางสาวอัสยา ช่างวิทยากร

หจตส-ท.

10 มิ.ย. 2565

## MEDIUM COST FOR BID NO. TIPN-S-05

## SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500/230 KV LAMPHUN 3 (GIS) AND 500 KV MAE MOH 3 (GIS) SUBSTATIONS  
TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 LAMPHUN 3 SUBSTATION (GIS)	THB	386,606,267.87				
				126,895,667.90	323,663,110.28	339,487.88	71,550,149.53
2	230 KV LAMPHUN 3 SUBSTATION (GIS)	THB	524,910.72				
				12,297,070.73		16,817.00	4,226,185.21
3	500 KV MAE MOH 3 SUBSTATION (GIS)	THB	511,669,012.73				
				231,448,558.97	389,196,560.07	74,626.97	113,708,302.25
BID PRICE		THB	898,800,191.32	Baht	Baht	Baht	Baht
				370,641,297.60	712,859,670.35	430,931.85	189,484,636.99
OTHER EXPENSES		THB	17,976,003.83				
VAT		THB	64,174,333.66	Baht	Baht	Baht	Baht
				25,944,890.83	49,900,176.92	30,165.23	13,263,924.59
SUMMARY OF BID PRICE		THB	980,950,528.81	Baht	Baht	Baht	Baht
				396,586,188.43	762,759,847.27	461,097.08	202,748,561.58
TOTAL MEDIUM COST		THB	2,343,506,223.17				
TOTAL MEDIUM COST (ROUND)		THB	2,340,000,000.00				

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22 Apr 2022

**MEDIUM COST FOR BID NO. TIPN-S-05**  
**SCHEDULE 1 : 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	385,313,542.87	121,527,723.90			71,550,149.53
PART 1C : CIVIL WORK				323,663,110.28		
PART 1D : SUPPLY OF SPARE PARTS	THB	1,292,725.00	5,367,944.00		339,487.88	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>386,606,267.87</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>
			<b>126,895,667.90</b>	<b>323,663,110.28</b>	<b>339,487.88</b>	<b>71,550,149.53</b>

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22 Apr 2022

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**


**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB4 : Surge Arrester	THB	3,060,000.00	624,000.00	405,240.00
Schedule 1AB5 : Current Transformer and Junction Box			104,000.00	11,440.00
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	4,202,800.00	503,200.00	517,660.00
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	353,823,687.00		38,920,605.57

  
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10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT  
SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB9 : Power Circuit Breaker	THB	12,013,016.00	745,709.00	1,403,459.75
Schedule 1AB10 : Disconnecting Switch	THB	2,681,264.00	551,500.00	355,604.04
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			1,689,058.00	185,796.38
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	3,013,008.10	2,022,900.00	553,949.89



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10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB14 : Substation Steel Structure			13,712,449.14	3,770,923.51
Schedule 1AB15 : Insulator				101,019.27
Schedule 1AB17 : XLPE Power Cable			40,339.20	9,244.40
Schedule 1AB18 : Low Voltage Cable and Conductor			64,086,846.91	14,686,569.08

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB19 : Switchyard Lighting Fixture			1,446,183.20	397,700.38
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	553,703.04	403,797.24	219,427.15
Schedule 1AB21 : Bus Fitting	THB	1,972,327.77		451,991.78
Schedule 1AB22 : Grounding Material	THB	3,763,600.24	2,996,111.57	1,606,497.37

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10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT  
SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB23 : Substation Miscellaneous	THB	230,136.72	777,605.64	230,940.96
Schedule 1AB24 : Control and Protection System			22,432,084.00	2,433,382.00
Schedule 1AB25 : Fault Recording System			3,537,321.00	353,732.00
Schedule 1AB33 : CCTV			4,528,189.00	578,836.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power			1,028,000.00	109,000.00
Schedule 1AB35 : Communication Cable			298,430.00	558,190.00
Schedule 1AB38 : Remote Terminal Unit				826,940.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				2,862,000.00
<b>PART 1AB</b>	<b>THB</b>	<b>385,313,542.87</b>	<b>Baht</b>	<b>Baht</b>
			<b>121,527,723.90</b>	<b>71,550,149.53</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 1C : CIVIL WORK**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Description	Local Currency ( excluding VAT ) Baht
	Amount
Schedule 1C1 : Foundation Work	28,445,647.00
Schedule 1C2 : Cable Trench	8,297,683.00
Schedule 1C3 : Building	147,458,972.80
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	12,693,281.50
Schedule 1C5 : Water Supply System	12,028.00
Schedule 1C6 : Drainage System	23,686,136.00
Schedule 1C7 : Special Construction Works	12,795,004.60
Schedule 1C8 : Miscellaneous	65,926,034.88
Schedule 1C9 : Fire Protection System	24,348,322.50
<b>PART 1C</b>	<b>Baht</b> <b>323,663,110.28</b> <i>อรุณ</i>

*J.*  
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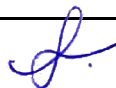
**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 1D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	1,292,725.00		71,099.88
Schedule 1D24 : Spare Parts for Control and Protection System			4,776,191.00	238,803.00
Schedule 1D25 : Spare Parts for Fault Recording System			591,753.00	29,585.00
<b>PART 1D</b>	<b>THB</b>	<b>1,292,725.00</b>	<b>Baht 5,367,944.00</b>	<b>Baht 339,487.88</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**SCHEDULE 2 : 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	524,910.72	11,991,256.73			4,226,185.21
PART 2D : SUPPLY OF SPARE PARTS			305,814.00		16,817.00	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>524,910.72</b>	<b>Baht</b> 12,297,070.73	<b>Baht</b>	<b>Baht</b> 16,817.00	<b>Baht</b> 4,226,185.21

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**


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

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 2AB15 : Insulator				52,006.41
Schedule 2AB18 : Low Voltage Cable and Conductor			10,242,458.16	2,347,230.00
Schedule 2AB20 : Aluminum Tube, Connector and Miscellaneous Hardware			503,606.40	115,409.80
Schedule 2AB21 : Bus Fitting	THB	218,655.85		50,108.63

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 2AB22 : Grounding Material	THB	306,254.87	601,508.47	208,029.10
Schedule 2AB23 : Substation Miscellaneous			169,022.70	38,734.37
Schedule 2AB24 : Control and Protection System			474,661.00	221,032.90
Schedule 2AB25 : Fault Recording System				96,630.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT**  
**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 2AB38 : Remote Terminal Unit				137,254.00
Schedule 2AB39 : Commissioning				675,000.00
Schedule 2AB40 : Installation of Equipment and Steel Structure Supplied by EGAT				284,750.00
<b>PART 2AB</b>	<b>THB</b>	<b>524,910.72</b>	<b>Baht</b>	<b>4,226,185.21</b>
			<b>11,991,256.73</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 2D24 : Spare Parts for Control and Protection System			305,814.00	16,817.00
<b>PART 2D</b>			<b>Baht 305,814.00</b>	<b>Baht 16,817.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**SCHEDULE 3 : 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	510,299,701.33	231,325,330.97			113,708,302.25
PART 3C : CIVIL WORK				389,196,560.07		
PART 3D : SUPPLY OF SPARE PARTS	THB	1,369,311.40	123,228.00		74,626.97	
<b>TOTAL PRICE</b>	<b>THB</b>	<b>511,669,012.73</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>	<b>Baht</b>
			<b>231,448,558.97</b>	<b>389,196,560.07</b>	<b>74,626.97</b>	<b>113,708,302.25</b>

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**MEDIUM COST FOR BID NO. TIPN-S-05**


**PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT  
SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB2 : Distribution Transformer			2,102,000.00	210,200.00
Schedule 3AB4 : Surge Arrester	THB	4,590,000.00	936,000.00	552,600.00
Schedule 3AB5 : Current Transformer and Junction Box	THB	381,000.00	146,000.00	52,700.00
Schedule 3AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	9,966,300.00	1,151,200.00	1,111,750.00

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB7 : SF6 Gas Insulated Switchgear	THB	454,916,169.00		45,491,616.90
Schedule 3AB9 : Power Circuit Breaker	THB	24,026,032.00	1,388,609.00	2,541,464.10
Schedule 3AB10 : Disconnecting Switch	THB	5,362,528.00	1,103,000.00	646,552.80
Schedule 3AB11 : Power Fuse, Fuse Link and Hook Stick	THB	1,061,010.50	0.00	106,101.05

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**MEDIUM COST FOR BID NO. TIPN-S-05**

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


**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB12 : AC&DC Distribution Board and Termination Box			3,477,634.00	347,763.40
Schedule 3AB13 : Stationary Battery and Battery Charger	THB	3,013,008.10	2,022,900.00	503,590.81
Schedule 3AB14 : Substation Steel Structure			32,726,152.89	8,181,538.22
Schedule 3AB15 : Insulator			นางสาวอาสยา ช่างวิทยาคาร	114,015.00

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB16 : Cable Terminations	THB	1,056,866.80		264,216.70
Schedule 3AB17 : XLPE Power Cable			1,678,600.00	419,650.00
Schedule 3AB18 : Low Voltage Cable and Conductor			119,850,508.03	29,962,627.01



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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB19 : Switchyard Lighting Fixtures			2,135,806.20	533,951.55
Schedule 3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	615,225.60	336,497.70	237,930.83
Schedule 3AB21 : Bus Fitting	THB	1,726,714.79		431,678.70
Schedule 3AB22 : Grounding Material	THB	3,333,453.64	2,577,926.95	1,477,845.15

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**MEDIUM COST FOR BID NO. TIPN-S-05**


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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB23 : Substation Miscellaneous	THB	251,392.90	768,735.20	255,032.03
Schedule 3AB24 : Control and Protection System			41,143,556.00	4,908,392.00
Schedule 3AB25 : Fault Recording System			5,385,619.00	794,851.00
Schedule 3AB33 : CCTV			4,490,276.00	567,573.00

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power			3,899,800.00	295,000.00
Schedule 3AB35 : Communication Cable			4,004,510.00	7,019,650.00
Schedule 3AB38 : Remote Terminal Unit				1,682,012.00

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 3AB39 : Commissioning				4,998,000.00
<b>PART 3AB</b>	<b>THB</b>	<b>510,299,701.33</b>	<b>Baht</b>	<b>Baht</b>
			<b>231,325,330.97</b>	<b>113,708,302.25</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**PART 3C : CIVIL WORK**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Description	Local Currency ( excluding VAT ) Baht
	Amount
Schedule 3C1 : Foundation Work	29,266,377.00
Schedule 3C2 : Cable Trench	26,010,328.00
Schedule 3C3 : Building	247,515,040.50
Schedule 3C4 : Earth Work, Road and Crushed Rock Surfacing	17,624,037.00
Schedule 3C5 : Water Supply System	1,223,103.64
Schedule 3C6 : Drainage System	16,247,921.00
Schedule 3C7 : Special Construction Works	14,206,467.87
Schedule 3C8 : Miscellaneous	4,617,824.06
Schedule 3C9 : Fire Protection System	32,485,461.00
<b>PART 3C</b>	<b>Baht 389,196,560.07</b>

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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	
		Amount	Amount	
Schedule 3D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	1,292,725.00		64,636.25
Schedule 3D11 : Spare Parts for Power Fuse, Fuse Link and Hook Stick	THB	76,586.40		3,829.32
Schedule 3D12 : Spare Parts for AC&DC Distribution Board and Termination Box			123,228.00	6,161.40
<b>PART 3D</b>	<b>THB</b>	<b>1,369,311.40</b>	<b>Baht</b>	<b>Baht</b>
			<b>123,228.00</b>	<b>74,626.97</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB4 : Surge Arrester**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT)	
					Foreign Supply		Local Supply		Baht	
					CIF Thai Port		Ex-works Price (excluding VAT)			
					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	12		THB	255,000.00	3,060,000.00			XXXXXX	XXXXXX
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	12					52,000.00	624,000.00	XXXXXX	XXXXXX
1AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB4-1 thru 1AB4-2				XXXXXX	XXXXXX	XXXXXX	XXXXXX	405,240.00	405,240.00
		Lump sum	Lump sum							
				<b>THB</b>	<b>3,060,000.00</b>		<b>Baht</b>		<b>Baht</b>	
<b>Total Price for Schedule 1AB4</b>							<b>624,000.00</b>		<b>405,240.00</b>	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB5 : Current Transformer and Junction Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB5-1	Junction Box type CT8 ( for bus differential ) as per Dwg. No. TP-E-18.6	2					52,000.00	104,000.00	XXXXXX	XXXXXX		
1AB5-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB5-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	11,440.00	11,440.00		
<b>Total Price for Schedule 1AB5</b>							<b>Baht 104,000.00</b>		<b>Baht 11,440.00</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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


**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
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	6		THB	525,350.00	3,152,100.00			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	525,350.00	1,050,700.00			XXXXX	XXXXX		
1AB6-3	Steel Supporting Structure for PD9W11 ( for Item No. 1AB6-1 ), H = 9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	6					49,400.00	296,400.00	XXXXX	XXXXX		
1AB6-4	Steel Supporting Structure for PD9011 ( for Item No. 1AB6-2 ), H = 9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	2					49,400.00	98,800.00	XXXXX	XXXXX		
1AB6-5	Junction Box type PT7 ( for Item No. 1AB6-1 ) as per Dwg. No. TP-E-18.5, TP-E-18.1-3/4 and TP-E-18.4	2					36,000.00	72,000.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB6-6	Junction Box type PT8 ( for Item No. 1AB6-2 ) as per Dwg. No. TP-E-18.5, TP-E-18.1-3/4 and TP-E-18.4	2					18,000.00	36,000.00	XXXXX	XXXXX		
1AB6-7	Cost of Local Transportation, Construction and Installation for Item No. 1AB6-1 thru 1AB6-6	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	517,660.00	517,660.00		
				<b>THB</b>	<b>4,202,800.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB6</b>							<b>503,200.00</b>		<b>517,660.00</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-1	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. LN3-S-1-01/04, LN3-S-1-02/04, LN3-S-2-01/01 and TYP1-S-3-01/02 (KT3A)	1		THB	101,092,482.00	101,092,482.00			XXXXX	XXXXX		
1AB7-2	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. LN3-S-1-01/04, LN3-S-1-02/04, LN3-S-2-01/01 and TYP1-S-3-01/02 (KT4A & Line No.1 to MAE MOH 3)	1		THB	151,638,723.00	151,638,723.00			XXXXX	XXXXX		
1AB7-3	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. LN3-S-1-01/04, LN3-S-1-02/04, LN3-S-2-01/01 and TYP1-S-3-01/02 (Line No.2 to MAE MOH 3)	1		THB	101,092,482.00	101,092,482.00			XXXXX	XXXXX		

  
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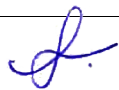
**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB7-4	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) (Metal Enclosed Bus) Including VTs and FESes at Main Bus as per Dwg. No. LN3-S-1-01/04, LN3-S-1-02/04, LN3-S-2-01/01 and TYP1-S-3-01/02	1	lot	THB	Included	Included			XXXXX	XXXXX		
1AB7-5	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) (GIB) as per Dwg. No. LN3-S-1-01/04, LN3-S-1-02/04, LN3-S-2-01/01 and TYP1-S-3-01/02	1	lot	THB	Included	Included			XXXXX	XXXXX		
1AB7-6	Local control cubicle for IS9450*	7	set	THB	Included	Included			XXXXX	XXXXX		
1AB7-7	Steel Supporting Structure for IS9450*	1	lot	THB	Included	Included			XXXXX	XXXXX		
1AB7-8	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. TIPN-S-05**

**1AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**


**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB7-9	Cost of Local Transportation, Construction and Installation for Item No. 1AB7-1 thru 1AB7-8				XXXXX	XXXXX	XXXXX	XXXXX	38,920,605.57	38,920,605.57		
	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>353,823,687.00</b>		<b>Baht</b>		<b>Baht 38,920,605.57</b>			

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

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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				
1AB9-1	525 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 55 MVar Y-connected five-limbed core type shunt reactor with 110 kV neutral reactor with earthed neutral)	2		THB	5,271,390.00	10,542,780.00			XXXXXX	XXXXXX		
1AB9-2	Controlled Switching Device with Control Cable link between Power Circuit Breaker and Controlled Switching Device for Item No. 1AB9-1	2		THB	593,882.00	1,187,764.00			XXXXXX	XXXXXX		
1AB9-3	Circuit breaker marshalling KIOSK (Design by contractor)	2					321,450.00	642,900.00	XXXXXX	XXXXXX		
1AB9-4	Steel Supporting Structure for CB995R(IEC) (Item No. 1AB9-1)*	2		THB	141,236.00	282,472.00			XXXXXX	XXXXXX		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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				
1AB9-5	BLANK SWING RACK PANEL WITH FIXED PLATE AND DIN RAILS for installation Item 1AB9-2 as per Dwg. No. TP-E-10.1	1					102,809.00	102,809.00	XXXXX	XXXXX		
1AB9-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB9-1 thru 1AB9-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,403,459.75	1,403,459.75		
<b>Total Price for Schedule 1AB9</b>				<b>THB</b>	<b>12,013,016.00</b>		<b>Baht</b>		<b>745,709.00</b>			
									<b>1,403,459.75</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. TIPN-S-05**

**1AB10 : Disconnecting Switch**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB10-1	550 kV 4000 A air switch with grounding blade (high creepage) motor operated as per Ratings and Features RF DS99KI(IEC) (phase spacing = 7.50 m)	2		THB	1,340,632.00	2,681,264.00			XXXXX	XXXXX		
1AB10-2	Steel Supporting Structure for DS99KI as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m (The structure shall be suitable for connecting with an earth fixed point (Item no. 1AB22-6) on the opposite side of grounding blade)	2					275,750.00	551,500.00	XXXXX	XXXXX		
1AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB10-1 thru 1AB10-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	355,604.04	355,604.04		
				<b>THB</b>	<b>2,681,264.00</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB10</b>							<b>551,500.00</b>		<b>355,604.04</b>			



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อวส

**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB12 : AC&DC Distribution Board and Termination Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount		
1AB12-1	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					137,137.00	137,137.00	XXXXX	XXXXX
1AB12-2	Termination Box type TB1 as per Dwg No. LT-TB-0-01	8					4,265.00	34,120.00	XXXXX	XXXXX
1AB12-3	Outdoor Receptacle Box type ORB3 as per Dwg. No. SE-ORB-0-01(for general purpose)	1					38,198.00	38,198.00	XXXXX	XXXXX
1AB12-4	Molded Case Selector Switch 125Vdc as per DWG. No. TYP1A-L-5-01/01	1					48,615.00	48,615.00	XXXXX	XXXXX
1AB12-5	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4	2					197,970.00	395,940.00	XXXXX	XXXXX
1AB12-6	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	2					233,188.00	466,376.00	XXXXX	XXXXX



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB12 : AC&DC Distribution Board and Termination Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB12-7	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4	4						142,168.00	568,672.00	XXXXXX	XXXXXX	
1AB12-8	Cost of Local Transportation, Construction and Installation for Item No. 1AB12-1 thru 1AB12-7	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	185,796.38	185,796.38	
<b>Total Price for Schedule 1AB12</b>								<b>Baht</b>		<b>Baht</b>		
								<b>1,689,058.00</b>		<b>185,796.38</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB13 : Stationary Battery and Battery Charger**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply					
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		Unit Price	Amount	Unit Price	Amount
					Unit Price	Amount	Unit Price	Amount				
1AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (for 500 kV Substation) (Designed by Contractor)											
1AB13-1a	a) Battery	2	set	THB	1,398,100.00	2,796,200.00			XXXXXX	XXXXXX		
1AB13-1b	b) Electrolyte	2	set	THB	22,821.91	45,643.82			XXXXXX	XXXXXX		
1AB13-1c	c) Battery Rack	2	set	THB	85,582.14	171,164.28			XXXXXX	XXXXXX		
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					674,300.00	2,022,900.00	XXXXXX	XXXXXX		
1AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB13-1 thru 1AB13-2								553,949.89	553,949.89		
				Lump sum	Lump sum							
				<b>THB</b>	<b>3,013,008.10</b>		<b>Baht</b>		<b>Baht</b>			
							<b>2,022,900.00</b>		<b>553,949.89</b>			
				<b>Total Price for Schedule 1AB13</b>								

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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				
1AB14-1	500 kV take-off structure (ST-1), design by contractor. See Dwg. No. ST-1 for reference.	3					1,941,019.74	5,823,059.22	XXXXX	XXXXX		
1AB14-2	500 kV transformer structure column (ST-2), design by contractor. See Dwg. No. WN-ST-2 for reference.	8					381,741.06	3,053,928.48	XXXXX	XXXXX		
1AB14-3	500 kV beam (B1-2), design by contractor. See Dwg. No. ST-1 for reference.	2					1,762,127.09	3,524,254.18	XXXXX	XXXXX		
1AB14-4	500 kV transformer structure beam (B2-2), design by contractor. See Dwg. No. WN-ST-2 for reference.	6					120,640.52	723,843.12	XXXXX	XXXXX		
1AB14-5	500 kV bus pole structure (BP901) as per Dwg. No. ST-BP-9-01	4					81,199.68	324,798.72	XXXXX	XXXXX		
1AB14-6	22 kV bus pole structure (BP203) as per Dwg. No. ST-BP-2-02	8					22,361.58	178,892.64	XXXXX	XXXXX		
1AB14-7	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	6					10,771.47	64,628.82	XXXXX	XXXXX		
1AB14-8	Neutral bus support structure single type (NS201) as per Dwg. No. UA-03-ST447-1B1-9	8					1,464.92	11,719.36	XXXXX	XXXXX		

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price Amount	
					CIF Thai Port		Unit Price Amount					
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB14-9	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	1					7,324.60	7,324.60	XXXXX	XXXXX		
1AB14-10	Cost of Local Transportation, Construction and Installation for Item No. 1AB14-1 thru 1AB14-9	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,770,923.51	3,770,923.51		
<b>Total Price for Schedule 1AB14</b>							<b>Baht 13,712,449.14</b>		<b>Baht 3,770,923.51</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB15 : Insulator**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
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	101,019.27	101,019.27		
<b>Total Price for Schedule 1AB15</b>							<b>Baht</b>	<b>Baht</b>		<b>101,019.27</b>		

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB17 : XLPE Power Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB17-1	22 kV 1/C no. 185 sq.mm. XLPE power cable as per Ratings and Features RF PC2710						40,339.20	40,339.20	XXXXX	XXXXX		
1AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB17-1				XXXXX	XXXXX	XXXXX	XXXXX	9,244.40	9,244.40		
<b>Total Price for Schedule 1AB17</b>							<b>Baht</b>	<b>40,339.20</b>	<b>Baht</b>	<b>9,244.40</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB18 : Low Voltage Cable and Conductor**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht					
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price		Amount	
					CIF Thai Port									
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount				
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				15,321,292.80	15,321,292.80	XXXXX	XXXXX				
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				25,850,609.40	25,850,609.40	XXXXX	XXXXX				
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				9,900.00	9,900.00	XXXXX	XXXXX				
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				2,132,539.20	2,132,539.20	XXXXX	XXXXX				
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				20,165,694.12	20,165,694.12	XXXXX	XXXXX				
1AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				606,811.39	606,811.39	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	14,686,569.08	14,686,569.08			
<b>Total Price for Schedule 1AB18</b>							<b>Baht 64,086,846.91</b>		<b>Baht 14,686,569.08</b>					

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**


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

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB20-1	Aluminum tube as per Specification attached	Lump sum	Lump sum					403,797.24	403,797.24	XXXXX	XXXXX	
1AB20-2	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	407,579.04	407,579.04				XXXXX	XXXXX	
1AB20-3	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	146,124.00	146,124.00				XXXXX	XXXXX	
1AB20-4	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum					Included in 1AB20-2	Included in 1AB20-2	XXXXX	XXXXX	
1AB20-5	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum					Included in 1AB20-3	Included in 1AB20-3	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	XXXXX	219,427.15	219,427.15	
<b>Total Price for Schedule 1AB20</b>				<b>THB</b>	<b>553,703.04</b>		<b>Baht</b>		<b>403,797.24</b>	<b>Baht</b>		<b>219,427.15</b>

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	1,495,949.63	1,495,949.63			XXXXX	XXXXX		
1AB21-2	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	476,378.14	476,378.14			XXXXX	XXXXX		
1AB21-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB21-1 thru 1AB21-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	451,991.78	451,991.78		
<b>Total Price for Schedule 1AB21</b>				<b>THB</b>	<b>1,972,327.77</b>		<b>Baht</b>		<b>Baht</b>			
									<b>451,991.78</b>			

  
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 10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB22 : Grounding Material**


**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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				
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	375,690.71	375,690.71			XXXXXX	XXXXXX		
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				2,926,539.59	2,926,539.59	XXXXXX	XXXXXX		
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	1,612,761.84	1,612,761.84			XXXXXX	XXXXXX		
1AB22-4	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	430,080.02	430,080.02			XXXXXX	XXXXXX		
1AB22-5	Disconnecting switch safety Mats	6					11,595.33	69,571.98	XXXXXX	XXXXXX		
1AB22-6	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	592,427.04	592,427.04			XXXXXX	XXXXXX		
1AB22-7	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	1	set	THB	752,640.63	752,640.63			XXXXXX	XXXXXX		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB22-8	Cost of Local Transportation, Construction and Installation for Item No. 1AB22-1 thru 1AB22-7				XXXXX	XXXXX	XXXXX	XXXXX	1,606,497.37	1,606,497.37		
				<b>THB</b>	<b>3,763,600.24</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 1AB22</b>							<b>2,996,111.57</b>		<b>1,606,497.37</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum					284,895.60	284,895.60	XXXXX	XXXXX	
1AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	230,136.72	230,136.72				XXXXX	XXXXX	
1AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum					154,664.64	154,664.64	XXXXX	XXXXX	
1AB23-4	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum					338,045.40	338,045.40	XXXXX	XXXXX	
1AB23-5	Cost of Local Transportation, Construction and Installation for Item No. 1AB23-1 thru 1AB23-4	Lump sum	Lump sum		XXXXXX	XXXXXX		XXXXXX	XXXXXX	230,940.96	230,940.96	
<b>Total Price for Schedule 1AB23</b>				<b>THB</b>	<b>230,136.72</b>		<b>Baht</b>	<b>777,605.64</b>		<b>Baht 230,940.96</b>		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation			
						Local Supply		Ex-works Price (excluding VAT)		Baht	
						Baht		Baht		Baht	
						Unit Price	Amount	Unit Price	Amount		
1AB24-1	500 kV BUS PROTECTION (LOW IMPEDANCE, NO SWITCHING ZONE, 6 feeders)	Panel Nos. 101R, 103R. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1-3, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	SET		995,778.00	1,991,556.00	XXXXXX	XXXXXX		
1AB24-2	500 kV BUS PROTECTION (LOW IMPEDANCE, NO SWITCHING ZONE, 6 feeders)	Panel Nos. 102R, 104R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1-3, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	SET		995,778.00	1,991,556.00	XXXXXX	XXXXXX		
1AB24-3	500/230 kV TRANSFORMER PROTECTION (5 RESTRAINS, 2-BF)	Panel No. 107R. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	1	EACH		1,386,729.00	1,386,729.00	XXXXXX	XXXXXX		
1AB24-4	500/230 kV TRANSFORMER PROTECTION (5 RESTRAINS, 1-BF)	Panel Nos. 109R. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	1	EACH		1,255,282.00	1,255,282.00	XXXXXX	XXXXXX		
1AB24-5	500/230 kV TRANSFORMER PROTECTION (5 RESTRAINS, 4-51, 24K)	Panel Nos. 108R, 110R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	EACH		1,610,156.00	3,220,312.00	XXXXXX	XXXXXX		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation	
						Local Supply		Baht	
						Ex-works Price (excluding VAT)			
						Unit Price	Amount	Unit Price	Amount
1AB24-6	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos. 111R, 114R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	EACH		1,366,098.00	2,732,196.00	XXXXXX	XXXXXX
1AB24-7	500 kV LINE PROTECTION (21P, 24L, 2-BF)	Panel Nos. 112R, 115R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	EACH		1,567,734.00	3,135,468.00	XXXXXX	XXXXXX
1AB24-8	500 kV SHUNT REACTOR PROTECTION	Panel Nos. 113R, 116R. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	2	EACH		976,515.00	1,953,030.00	XXXXXX	XXXXXX
1AB24-9	500 kV TRIP CIRCUIT SUPERVISION (5-BKR)	Panel Nos. 105R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	1	EACH		603,671.00	603,671.00	XXXXXX	XXXXXX
1AB24-10	500 kV TRIP CIRCUIT SUPERVISION (2-BKR)	Panel Nos. 106R Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	1	EACH		505,770.00	505,770.00	XXXXXX	XXXXXX



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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation			
						Local Supply		Ex-works Price (excluding VAT) Baht		Ex-works Price (excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount		
1AB24-11	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel Nos. S1. Installed at Control Room. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1, LN3-E-3.1 sh. 1 and TP-E-10.1.	1	EACH		617,885.00	617,885.00	XXXXXX	XXXXXX		
1AB24-12	INTERPOSING PANEL TYPE IP7	Panel No. IP11, IP12 Drawing Nos. LN3-E-1.1 sh. 1, TP-E-6.4 sh. 1/6, TP-E- 6.4 sh. 2/6, TP-E-6.4 sh. 3/6, TP-E-6.4 sh. 4/6, TP-E-6.4 sh. 5/6 and TP-E-6.4 sh. 6/6.	1	EACH		1,136,404.00	1,136,404.00	XXXXXX	XXXXXX		
1AB24-13	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel No. MPC11, MPC12 Drawing Nos. LN3-E-1.1 sh. 1 and TP-E-10.3.	2	EACH		Supplied By EGAT	Supplied By EGAT	XXXXXX	XXXXXX		
1AB24-14	MARSHALLING PANEL FOR TELEPROTECTION (500 kV)	Panel No. MP-TELE11 Drawing Nos. LN3-E-1.1 sh. 1, TP-E-10.3 DW-TPS-D01-112-01 SH. P1-P7 and DW-TPS-D01-115-01 SH. P1-P6	1	EACH		395,509.00	395,509.00	XXXXXX	XXXXXX		



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**1AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation	
						Local Supply		Baht	
						Ex-works Price (excluding VAT)		(excluding VAT)	
						Unit Price	Amount	Unit Price	Amount
1AB24-15	MARSHALLING PANEL FOR FRS	Panel No. MP-FRS11 Drawing Nos. LN3-E-1.1 sh. 1 and TP-E-10.3.	1	EACH		Supplied By EGAT	Supplied By EGAT	XXXXXX	XXXXXX
1AB24-16	MARSHALLING PANEL FOR RTU	Panel Nos. MP-RTU11, MP-RTU12 Drawing Nos. LN3-E-1.1 sh. 1 and TP-E-10.3.	2	EACH		Supplied By EGAT	Supplied By EGAT	XXXXXX	XXXXXX
1AB24-17	TRANSDUCER PANEL	Panel No. TDR11 including 1-Temp TDR, 1-AC-TDR, 3-DC-TDR, 6-V-TDR 1 ph., 2-A-TDR 1ph., 6-T-TDR, 6-R-TDR, 4-W&VAR TDR, 4-TS and 1-VTR. Drawing Nos. LN3-E-1.1 sh. 1 and TP-E-10.2.	1	EACH		801,745.00	801,745.00	XXXXXX	XXXXXX



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1AB24 : Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation	
						Local Supply		Baht	
						Ex-works Price (excluding VAT)		(excluding VAT)	
						Unit Price	Amount	Unit Price	Amount
1AB24-18	GPS RECEIVER PANEL	GPS Reciever Panel. The Ethernet ports not less than 64 ports. Drawing Nos. LN3-E-1.1 sh. 1, LN3-E-2.1 sh. 1 and TP-E-10.15. Spec No. 1002, SD-FOT-P22 and SD-COM-P02	1	SET		704,971.00	704,971.00	XXXXX	XXXXX
1AB24-19	Cost of Local Transportation, Construction and Installation for Item No. 1AB24-1 thru 1AB24-18			Lump Sum	Lump Sum	XXXXXX	XXXXXX	2,433,382.00	2,433,382.00
<b>Total Price for Schedule 1AB24</b>						<b>Baht</b>	<b>22,432,084.00</b>	<b>Baht</b>	<b>2,433,382.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB25 : Fault Recording System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation, Construction and Installation	
						Local Supply		(excluding VAT)	
						Ex-works Price		Baht	
						Unit Price	Amount	Unit Price	Amount
1AB25-1	FAULT RECORDING SYSTEM, 48 ANALOG INPUT, 240 DIGITAL INPUT.	Panel no. FRS11 Drawing Nos. LN3-E-1.1 sh. 1.	1	SET		3,537,321.00	3,537,321.00	XXXXXX	XXXXXX
1AB25-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB25-1		Lump Sum	Lump Sum		XXXXXX	XXXXXX	353,732.00	353,732.00
<b>Total Price for Schedule 1AB25</b>						<b>Baht</b>	<b>3,537,321.00</b>	<b>Baht</b>	<b>353,732.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB33 : CCTV**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and ( 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		
1AB33-1	CCTV System and accessories including:	1	SET			4,528,189.00	4,528,189.00	XXXXX	XXXXX			
	(1) Outdoor PTZ Dome Camera (1 EA) (2) Indoor Fixed Camera (9 EA) (3) Outdoor Fixed Camera (22 EA) (4) PC Workstation (1 SET) (5) Server (1 SET) (6) Software license (6.1) Software management license (1 Licenses) (6.2) Redording license (32 Licenses) (6.3) Video analytic license (32 Licenses) (7) Ethernet I/O Module (1 EA) (8) Monitor (4 EA) (9) HDMI Optical Extender (2 SET) (10) LAN Switch (2 EA) (11) CCTV Rack Cabinet (1 EA) Size: 60x60x218.5cm. Front door: Steel sheet with Plastic Acrylic Rear door: Perforated steel sheet (12) CCTV steel box/ End-point steel box (Lumpsum) (13) Monitoring Desk (1 EA)											

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB33 : CCTV**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local	
					Foreign Supply		Local Supply		Transportation, Construction and ( excluding VAT ) Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT ) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
	(14) PoE Injector for Fixed camera(31 EA)									
	(15) Adapter for PTZ camera (1 EA)									
	(16) CCTV Pole 2 เมตร (Lumpsum)									
	(17) CCTV Pole 4 เมตร (Lumpsum)									
	(18) Indoor-type twisted pair cable(Lumpsum)									
	(19) Outdoor-type twisted pair cable(Lumpsum)									
	(20) 12-core ADSS Optical Fiber Cable(Lumpsum)									
	(21) Media Converter (UTP-Fiber Optic) (28 SET)									
	(22) Surge protection-220VAC (14 EA)									
	(23) Line Filter(14 EA)									
	(24) สายไฟฟ้า (Lumpsum)									
	(25) ท่อ EMT (Lumpsum)									
	(26) ท่อ IMC, เหล็กอ่อนกันน้ำมี PVC หุ้ม (Lumpsum)									
	(27) E-flex (Lumpsum)									
	(28) Ground System (Lumpsum)									
	(29) Accessories (Lumpsum)									

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB33 : CCTV**


**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and ( excluding VAT ) Baht			
					Foreign Supply		Local Supply		Ex-works Price ( excluding VAT ) Baht			
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
1AB33-2	Cost of Local Transportation Construction and Installation for Item no 1AB33-1	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	578,836.00	578,836.00		
	<p><b>IMPORTANT :</b></p> <p>1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration</p> <p>2. Telecommunication Equipment supplied under Schedule 1AB33 shall conform to Specification No SD-CCTV-P01, Drawing No. DW-COM-D01-007-ALL and DW-CAB-D01-019</p>											
<b>Total Price for Schedule 1AB33</b>							<b>Baht</b>		<b>Baht</b>			
							<b>4,528,189.00</b>		<b>578,836.00</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB34-1	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 300 Ah (Tubular plate) at 10 Hour rated, 24 Cells, Norminal Voltage 2 Volts/Cell, with Rack 1 set (500kV Lumphun 3 Relay Building-1)	1	SET					258,000.00	258,000.00	XXXXXX	XXXXXX	
1AB34-2	Conventional Type Charger 48VDC, 75 A (500kV Lumphun 3 Relay Building-2)	2	SET					314,000.00	628,000.00	XXXXXX	XXXXXX	
1AB34-3	48Vdc. Load Center Type2: 30 Breaker (500kV Lumphun 3 Relay Building-1)	1	SET					142,000.00	142,000.00	XXXXXX	XXXXXX	
1AB34-4	Local Transportation, Construction and Installation for item 1AB34-1, 1AB34-2 and 1AB34-3	1	JOB			XXXXXX	XXXXXX	XXXXXX	XXXXXX	109,000.00	109,000.00	
<b>Total Price for Schedule 1AB34</b>								<b>Baht 1,028,000.00</b>		<b>Baht 109,000.00</b>		

  
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10 มิ.ย. 2565

## MEDIUM COST FOR BID NO. TIPN-S-05

## 1AB35 : Communication Cable

## SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)

## TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB35-1	<b>Optical fiber cable from fiber frame termination cabinet at 230/115 kV Lamphun 3 (LN3) control building to 2-way joint box at Mae Moh 3 take-off structure</b>											
1AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 300 meters) (b) Rigid steel conduit 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 (230/115 kV LN3 control building-1 set) (e) Fiber frame termination cabinet with cable tray (230/115 kV LN3 control building-1 set) (f) 36 Pigtaills (1.5 meters) (230/115 kV LN3 control building-1 set) (g) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					113,570.00	113,570.00	XXXXX	XXXXX	
1AB35-1.2	Local transportation, Construction and Installation for item 1AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	187,420.00	187,420.00	



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22 Apr 2022



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB35-2	<b>Optical fiber cable from fiber frame termination cabinet at 230/115 kV Lamphun 3 (LN3) control building to 500 kV Lamphun 3 (LN3) relay building (ROUTE NO.1)</b>											
1AB35-2.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 250 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Rack cabinet and accessories (500 kV LN3 relay building-1 set) (d) Fiber frame termination cabinet with cable tray (230/115 kV LN3 control building-1 set, 500 kV LN3 relay building-1 set) (e) 36 Pigtails (1.5 meters) (230/115 kV LN3 control building-1 set, 500 kV LN3 relay building-1 set)	1	LOT					103,260.00	103,260.00	XXXXX	XXXXX	
1AB35-2.2	Local transportation, Construction and Installation for item 1AB35-2.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	190,200.00	190,200.00		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB35-3 1AB35-3.1	<b>Optical fiber cable from fiber frame termination cabinet at 230/115 kV Lamphun 3 (LN3) control building to 500 kV Lamphun 3 (LN3) relay building (ROUTE NO.2)</b> Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 250 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (230/115 kV LN3 control building-1 set, 500 kV LN3 relay building-1 set) (d) 36 Pigtails (1.5 meters) (230/115 kV LN3 control building-1 set, 500 kV LN3 relay building-1 set)	1	LOT					81,600.00	81,600.00	XXXXXX	XXXXXX	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
1AB35-3.2	Local transportation, Construction and Installation for item 1AB35-3.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	180,570.00	180,570.00		
	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 1AB35</b>								<b>Baht</b>	<b>298,430.00</b>	<b>Baht</b>	<b>558,190.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB38 : Remote Terminal Unit**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	This item include installation and configuration software. Installed at Control Room.	1	SET		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
1AB38-2	EGAT RTU TYPE 621M	Panel No. RTU11 Installed at Relay Building No.1	1	EACH		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
1AB38-3	EGAT RTU TYPE 16D	Panel No. RTU12 Installed at Relay Building No.1	1	EACH		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
1AB38-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB38-1 thru 1AB38-3		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	826,940.00	826,940.00		
<b>Total Price for Schedule 1AB38</b>								<b>Baht</b>		<b>Baht</b> <b>826,940.00</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
1AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	2,862,000.00	2,862,000.00		
<b>Total Price for Schedule 1AB39</b>							<b>Baht</b>		<b>Baht</b>	<b>2,862,000.00</b>		

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22 Apr 2022

- Project 1-1C1 -

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filename : TIPN-S-05-1 (500 kV LN3) 65

## MEDIUM COST FOR BID NO. TIPN-S-05

## 1C1 : Foundation Work

## SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)

## TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-TS-9-01, SD-PL-0-01, See Scope of work	3	set	1,029,287.00	3,087,861.00
1C1-2	500 kV Take off structure foundation with Firewall foundation (FW901)pile Type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-TX-9-01, SD-PL-0-01, See Scope of work	8	set	401,265.00	3,210,120.00
1C1-3	500 kV Voltage transformer support structure foundation ( VT901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-VT-9-01, SD-PL-0-01, See Scope of work	8	set	50,654.00	405,232.00
1C1-4	500 kV Lightning arrester support structure foundation (LA901) Pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-SA-9-01, SD-PL-0-01, See Scope of work	12	set	50,654.00	607,848.00
1C1-5	500 kV Bus pole support structure foundation ( BP901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-BP-9-01, SD-PL-0-01, See Scope of work	4	set	59,733.00	238,932.00

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- Project 1-1C1 -

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10 มิ.ย. 2565

filename : TIPN-S-05-1 (500 kV LN3)

**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-6	22 kV Bus pole support structure foundation (BP 201, BP202, BP203) Pile Type(BP203 only) (Dowel bar , Pile cut off and Pile shoe are included)	FD-BP-2-02 01/01, SD-PL-0-01, See Scope of work	8	set	12,888.00	103,104.00
1C1-7	Power Transformer foundation ( T300 ) with oil containing pit (pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor. TT/KK4-TX-8-04, SD-PL-0-01, See Scope of work	6	set	1,260,376.00	7,562,256.00
1C1-8	Common control cubicle foundation (CCC) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, NCO-CCC-0-01, SD-PL-0-01, See Scope of work	2	set	23,454.00	46,908.00
1C1-9	500 kV GIB Air bushing support structure foundation (BT901) pile Type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, TT/KK4-GTS-9-01, SD-PL-0-01, See Scope of work	12	set	44,819.00	537,828.00
1C1-10	500 kV GIB support structure foundation ( Pile type ) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, See Scope of work	Lump Sum	Lump Sum	7,028,235.00	7,028,235.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-11	Modified T-200 Transformer Foundation for Installing Removable Deadman Hook (DM-I and RC.Deadman Hook for Loading Out DM-O) Pad type(DM-O(L))	FD-TX-8-03 01/01	6	set	108,172.00	649,032.00
1C1-12	Modified T-125 Transformer Foundation for Installing Removable Deadman Hook (DM-I and RC.Deadman Hook for Loading Out DM-O) pad type(DM-O)	FD-TX-7-06 01/01	10	set	74,442.00	744,420.00
1C1-13	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type(LP) (Dowel bar , Pile cut off and Pile shoe are included)	FD-LP-0-05 01/01, SD-PL-0-01, See Scope of work	36	set	28,929.00	1,041,444.00
1C1-14	Lighting Relay Panel foundation(RP002) Pad Type	FD-RP-0-03 01/01	1	set	6,959.00	6,959.00
1C1-15	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05 01/01	1	set	7,268.00	7,268.00
1C1-16	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02 01/01	6	set	2,725.00	16,350.00
1C1-17	500 kV Power circuit breaker foundation ( CB901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, MM3-CB-9-01, SD-PL-0-01, See Scope of work	2	set	282,627.00	565,254.00

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22 Apr 2022

- Project 1-1C3 -

filename : TIPN-S-05-1 (500 kV LN3)

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C1-18	500 kV Disconnecting switch foundation ( DS901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, TT/KK4-DS-9-01, SD-PL-0-01, See Scope of work	2	set	305,297.00	610,594.00
1C1-19	Circuit breaker marshalling kiosk foundation ( MK ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, 1WAU624795-AGT, SD-PL-0-01, See Scope of work	2	set	22,749.00	45,498.00
1C1-20	500 kV Shunt reactor foundation ( SR901 ) and oil pit (pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, TT/KK4-SR-9-01, SD-PL-0-01, See Scope of work	2	set	896,133.00	1,792,266.00
1C1-21	500 kV Neutral reactor foundation ( NR901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-SNR-9-01, SD-PL-0-01, See Scope of work	2	set	69,119.00	138,238.00
<b>Total Price for Schedule 1C1</b>					<b>Baht</b>	<b>28,445,647.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 - 01/02, SD-CE-0-02 - 02/02 See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	2,364,717.00	2,364,717.00
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 - 01/02, SD-CE-0-02 - 02/02 See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	129,232.00	129,232.00
1C2-3	Cable trench, steel cover included (Type"A")	Designed by Contractor See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	5,186,040.00	5,186,040.00
1C2-4	Cable trench, steel cover included (Type"B")	Designed by Contractor See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	617,694.00	617,694.00
<b>Total Price for Schedule 1C2</b>					<b>Baht</b>	<b>8,297,683.00</b>

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**


**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 01/09-09/09 See Dwg. No. LN3-C-1 See Scope of work	Lump Sum	Lump Sum	132,333,019.00	132,333,019.00
1C3-2	500kV Relay Building	Designed by Contractor SD-RB-0-01A 01/21-21/21 SD-RB-0-01FP 01/01 SD-RB-0-01ME 01/01 SD-RB-0-01SN 01/03-03/03 SD-RB-0-01C 01/20-20/20 See Dwg. No. LN3-C-1 See Scope of work	Lump Sum	Lump Sum	15,125,953.80	15,125,953.80
1C3-2.1	Air conditioning system and Ventilation system					
1C3-2.1.1	Minimum 40,000 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 )		8	set	-	-

  
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- Project 1-1C6 -

  
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filename : TIPN-S-05-1 (500 kV LN3)

**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C3-2.1.2	Extra work for air conditioning system (additional cooling capacity included)		Lump Sum	Lump Sum	-	-
1C3-2.1.3	Ventilation system		Lump Sum	Lump Sum	-	-
<b>Total Price for Schedule 1C3</b>					<b>Baht 147,458,972.80</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1C4 : Earth Work, Road and Crushed Rock Surfacing**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht		
					Unit Price	Amount	
1C4-1	Crushed rock surfacing 0.10 m thickness	See Dwg. No. LN3-C-1		Lump Sum		5,361,744.00	5,361,744.00
1C4-2	Transformer loading	SD-RD-0-03 See Dwg. No. TYP1A-C-6		Lump Sum		1,187,462.50	1,187,462.50
1C4-3	RC.Road type " E " section 4 - 4	SD-RD-0-01 See Dwg. No. TYP1A-C-6		Lump Sum		6,144,075.00	6,144,075.00
<b>Total Price for Schedule 1C4</b>						<b>Baht</b>	<b>12,693,281.50</b>

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1C5 : Water Supply System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht		
					Unit Price	Amount	
1C5-1	Water supply system	Designed by Contractor See Scope of work See Dwg. No. TYP1A-C-9		Lump Sum	Lump Sum	12,028.00	12,028.00
<b>Total Price for Schedule 1C5</b>						<b>Baht</b>	<b>12,028.00</b>

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C6 : Drainage System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht	
					Unit Price	Amount
1C6-1	Drainage System	Designed by Contractor See Scope of work See Dwg. No. TYP1A-C-6	Lump Sum	Lump Sum	23,686,136.00	23,686,136.00
<b>Total Price for Schedule 1C6</b>					<b>Baht</b>	<b>23,686,136.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		1	set	850,000.00	850,000.00
1C7-2	Test and commissioning for fire protection system in switchyard		Lump Sum	Lump Sum	100,000.00	100,000.00
1C7-3	Test and commissioning for inert gas system (Test in cable room)		Lump Sum	Lump Sum	78,000.00	78,000.00
1C7-4	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)		8	set	120,000.00	960,000.00
1C7-5	Fire Protection design work		Lump Sum	Lump Sum	430,253.01	430,253.01
1C7-6	Architectural and Civil engineering design work		Lump Sum	Lump Sum	9,257,907.29	9,257,907.29
1C7-7	Dynamic Pile load test		Lump Sum	Lump Sum	750,000.00	750,000.00
1C7-8	Static pile load test		2	set	184,422.15	368,844.30
<b>Total Price for Schedule 1C7</b>					<b>Baht 12,795,004.60</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C8 : Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht		
					Unit Price	Amount	
1C8-1	Wire mesh fence and gate (Pile type )	SD-CF-0-01 See Dwg. LN3-C-1		Lump Sum	Lump Sum	1,541,736.00	1,541,736.00
1C8-2	Noise barrier (Pile type)	Designed by Contractor, NA-NB-0-01, See Scope of work		Lump Sum	Lump Sum	61,673,696.00	61,673,696.00
1C8-3	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01 - 01/01		Lump Sum	Lump Sum	2,710,602.88	2,710,602.88
<b>Total Price for Schedule 1C8</b>						<b>Baht</b>	<b>65,926,034.88</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 Relay Building	Designed by Contractor	Lump Sum	Lump Sum	5,300,130.00	5,300,130.00
1C9-2	Fire Protection System for 500kV GIS Building	Designed by Contractor	Lump Sum	Lump Sum	6,715,830.00	6,715,830.00
1C9-3	Foam house	SD-FH-8-01 01/07 to 07/07	2	set	986,040.00	1,972,080.00
1C9-4	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04 - 01/01	3	set	252,673.00	758,019.00
1C9-5	Bladder tank proportioning system and components	Designed by Contractor	2	set	999,900.00	1,999,800.00
1C9-6	Fire Protection System for transformer / shunt reactor	Designed by Contractor	8	set	579,859.50	4,638,876.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht		
					Unit Price	Amount	
1C9-7	Fire Protection System for switchyard	Designed by Contractor		Lump Sum		2,066,564.50	2,066,564.50
1C9-8	Fire Protection environmental monitoring system	Designed by Contractor		Lump Sum		791,450.00	791,450.00
1C9-9	PC. or RC. Pile sq. 0.26 * 0.26 m (Dowel bar, Pile cut off and Pile shoe included)	SD-PL-0-01 - 01/01		Lump Sum		105,573.00	105,573.00
<b>Total Price for Schedule 1C9</b>						<b>Baht</b>	<b>24,348,322.50</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**1D7 : Spare Parts for SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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
1D7-1	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	45,021.00	45,021.00			XXXXXX	XXXXXX
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	45,021.00	45,021.00			XXXXXX	XXXXXX
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1 EA for each type/ each operating pressure)	1	set	THB	38,589.00	38,589.00			XXXXXX	XXXXXX
1D7-4	Pump with motor for hydraulic spare parts for GIS (if	1	set	THB	Included	Included			XXXXXX	XXXXXX
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	405,182.00	405,182.00			XXXXXX	XXXXXX
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	205,807.00	205,807.00			XXXXXX	XXXXXX
1D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	192,943.00	192,943.00			XXXXXX	XXXXXX
1D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	360,162.00	360,162.00			XXXXXX	XXXXXX

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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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
1D7-9	Cost of Local Transportation for Item No 1D7-1 thru 1D7-8	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	71,099.88	71,099.88
<b>Total Price for Schedule 1D7</b>				THB	<b>1,292,725.00</b>		Baht		<b>Baht 71,099.88</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price			
						Unit Price	Amount	Unit Price	Amount
1D24-1	BUS DIFFERENTIAL RELAY (Low Impedance-No Switching Zone)	Supply for loose part. Same type as 87BP. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		666,480.00	666,480.00	33,324.00	33,324.00
1D24-2	BUS DIFFERENTIAL RELAY (Low Impedance-No Switching Zone)	Supply for loose part. Same type as 87BS. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		666,480.00	666,480.00	33,324.00	33,324.00
1D24-3	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply for loose part. Same type as 21P. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		447,816.00	447,816.00	22,390.00	22,390.00
1D24-4	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply for loose part. Same type as 21S. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		447,816.00	447,816.00	22,390.00	22,390.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount
1D24-5	AUTO RECLOSING AND SYNCHRONISM CHECK RELAY (79+25)	Supply for loose part. Same type as 79+25. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		69,953.00	69,953.00	3,497.00	3,497.00
1D24-6	TRANSFORMER DIFFERENTIAL RELAY (87K, 6 restraint windings)	Supply for loose part. Same type as 87KP Dwg Nos.MM3-E-1.1 sh. 1.	1	EACH		872,901.00	872,901.00	43,645.00	43,645.00
1D24-7	TRANSFORMER DIFFERENTIAL RELAY (87K, 6 restraint windings)	Supply for loose part. Same type as 87KS Dwg Nos.MM3-E-1.1 sh. 1.	1	EACH		872,901.00	872,901.00	43,645.00	43,645.00
1D24-8	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Supply for loose part. Same type as 51. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		87,047.00	87,047.00	4,352.00	4,352.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price			
						Unit Price	Amount	Unit Price	Amount
1D24-9	OVERCURRENT GROUND BACKUP RELAY (51GB)	Supply for loose part. Same type as 51GB. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		87,047.00	87,047.00	4,352.00	4,352.00
1D24-10	BREAKER FAILURE RELAY (50BF+62BF)	Supply for loose part. Same type as 50BF Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		121,275.00	121,275.00	6,063.00	6,063.00
1D24-11	OVERFLUXING RELAY (24K,24L)	Supply for loose part. Same type as 24K Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		100,485.00	100,485.00	5,024.00	5,024.00
1D24-12	REACTOR DIFFERENTIAL RELAY (87R)	Supply for loose part. Same type as 87R. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		150,379.00	150,379.00	7,518.00	7,518.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price			
						Unit Price	Amount	Unit Price	Amount
1D24-13	NEUTRAL REACTOR DIFFERENTIAL RELAY (87RN)	Supply for loose part. Same type as 87RN. Dwg Nos.LN3-E-1.1 sh. 1.	1	EACH		88,119.00	88,119.00	4,405.00	4,405.00
1D24-14	OVERVOLTAGE RELAY (59N,59C)	Supply for loose part. Same type as 59N. Dwg Nos.MM3 - E - 1.1 sh. 1.	1	EACH		97,492.00	97,492.00	4,874.00	4,874.00
<b>Total Price for Schedule 1D24</b>						<b>Baht</b>	<b>4,776,191.00</b>	<b>Baht</b>	<b>238,803.00</b>

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price			
						Unit Price	Amount	Unit Price	Amount
1D25-1	ANALOG ISOLATOR CARD	Supply as loose part.	1	EACH		87,300.00	87,300.00	4,365.00	4,365.00
1D25-2	POWER SUPPLY	Supply as loose part.	1	EACH		36,118.00	36,118.00	1,805.00	1,805.00
1D25-3	ACQUISITION UNIT	Supply as loose part.	1	EACH		25,669.00	25,669.00	1,283.00	1,283.00
1D25-4	CPU & MEMORY MODULE 1	Supply as loose part.	1	EACH		85,581.00	85,581.00	4,279.00	4,279.00
1D25-5	ANALOG ISOLATOR FOR VOLTAGE	Supply as loose part.	1	EACH		85,581.00	85,581.00	4,279.00	4,279.00
1D25-6	ANALOG ISOLATOR FOR CURRENT	Supply as loose part.	1	EACH		85,581.00	85,581.00	4,279.00	4,279.00
1D25-7	DIGITAL ISOLATOR MODULE	Supply as loose part.	1	EACH		83,232.00	83,232.00	4,161.00	4,161.00
1D25-8	HARD DISK & HARD DISK CONTROLLER	Supply as loose part.	1	EACH		77,022.00	77,022.00	3,851.00	3,851.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**1D25 : Spare Parts for Fault Recording System**  
**SUPPLY AND CONSTRUCTION OF 500 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment		Local Transportation	
						Local Supply		( excluding VAT ) Baht	
						Ex-works Price ( excluding VAT ) Baht			
						Unit Price	Amount	Unit Price	Amount
1D25-9	TELE- COMMUNICATION BOARD	Supply as loose part.	1	EACH		25,669.00	25,669.00	1,283.00	1,283.00
<b>Total Price for Schedule 1D25</b>						<b>Baht</b>	<b>591,753.00</b>	<b>Baht</b>	<b>29,585.00</b>



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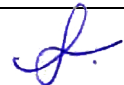
**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB15 : Insulator**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (excluding VAT) Baht			
					Foreign Supply		Local Supply		Ex-works Price (excluding VAT) Baht		Unit Price	Amount
					CIF Thai Port							
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount		
2AB15-1	Suspension insulator ANSI52-3 as per Specification attached											
		Lump sum	Lump sum		supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXXX	XXXXXX		
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	XXXXXX	XXXXXX		
2AB15-3	Cost of Local Transportation, Construction and Installation for Item No 2AB15-1 thru 2AB15-2											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	52,006.41	52,006.41		
<b>Total Price for Schedule 2AB15</b>								<b>Baht</b>			<b>52,006.41</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**2AB18 : Low Voltage Cable and Conductor**  
**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB18-1	750 V power cable as per Specification attached						22,704.00	22,704.00	XXXXX	XXXXX		
2AB18-2	600 V control cable with PVC insulation as per Specification attached						1,846,284.00	1,846,284.00	XXXXX	XXXXX		
2AB18-3	Annealed copper ground wire as per Specification attached						7,071,738.96	7,071,738.96	XXXXX	XXXXX		
2AB18-4	Overhead ground wire as per Specification attached						19,219.20	19,219.20	XXXXX	XXXXX		
2AB18-5	Aluminum conductor as per Specification attached						1,282,512.00	1,282,512.00	XXXXX	XXXXX		
2AB18-6	Cost of Local Transportation, Construction and Installation for Item No 2AB18-1 thru 2AB18-5						XXXXX	XXXXX	XXXXX	XXXXX		
									2,347,230.00	2,347,230.00		
<b>Total Price for Schedule 2AB18</b>									<b>Baht</b>	<b>Baht</b>		
									<b>10,242,458.16</b>	<b>2,347,230.00</b>		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB20-1	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum					344,504.16	344,504.16	XXXXXX	XXXXXX	
2AB20-2	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum					159,102.24	159,102.24	XXXXXX	XXXXXX	
2AB20-3	Cost of Local Transportation, Construction and Installation for Item No 2AB20-1 thru 2AB20-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	115,409.80	115,409.80	
<b>Total Price for Schedule 2AB20</b>								<b>Baht</b>	<b>503,606.40</b>	<b>Baht</b>	<b>115,409.80</b>	



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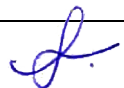
**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
2AB21-1	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	218,655.85	218,655.85			XXXXX	XXXXX		
2AB21-2	Cost of Local Transportation, Construction and Installation for Item No 2AB21-1	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	50,108.63	50,108.63		
<b>Total Price for Schedule 2AB21</b>				THB	<b>218,655.85</b>		Baht		<b>Baht 50,108.63</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**


**2AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	100,375.38	100,375.38			XXXXX	XXXXX		
2AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				601,508.47	601,508.47	XXXXX	XXXXX		
2AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	205,879.49	205,879.49			XXXXX	XXXXX		
2AB22-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB22-1 thru 2AB22-3	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	208,029.10	208,029.10		
				THB	306,254.87		Baht		Baht			
<b>Total Price for Schedule 2AB22</b>							601,508.47		208,029.10			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and ( excluding VAT )			
					Foreign Supply		Local Supply		Baht		Baht	
					CIF Thai Port		Ex-works Price ( excluding VAT )		Baht		Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB23-1	Identification and danger notice plate as per drawing attached											
		Lump sum	Lump sum			169,022.70	169,022.70	XXXXXX	XXXXXX			
2AB23-2	Cost of Local Transportation, Construction and Installation for Item No 2AB23-1											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	38,734.37	38,734.37		
<b>Total Price for Schedule 2AB23</b>								<b>Baht</b>	<b>169,022.70</b>	<b>Baht</b>	<b>38,734.37</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB24-1	230 kV BREAKER FAILURE PROTECTION (2-BF)	Panel No. 29R. Installed at Control Room Drawing Nos. LN3-E-1.2 sh. 1-3, LN3-E-2.2 sh. 1, LN3-E-3.2 sh. 1 and TP-E-10.1.	1	EACH					448,387.00	448,387.00	XXXXX	XXXXX	
2AB24-2	VOLTAGE TRANSDUCER (V-TDR)	V-TDR 1 ph. Installed in TDR panel at Control Room. Drawing Nos. LN3-E-1.2 sh. 1-3.	2	EACH					13,137.00	26,274.00	XXXXX	XXXXX	
2AB24-3	MODIFY EXISTING CONTROL AND PROTECTION SYSTEM	See Scope of work	Lump Sum	Lump Sum			XXXXX	XXXXX	XXXXX	XXXXX	170,267.90	170,267.90	
2AB24-4	Cost of Local Transportation, Construction and Installation for Item No. 2AB24-1 thru 2AB24-2		Lump Sum	Lump Sum			XXXXX	XXXXX	XXXXX	XXXXX	50,765.00	50,765.00	
<b>Total Price for Schedule 2AB24</b>										<b>Baht</b>	<b>474,661.00</b>	<b>Baht</b>	<b>221,032.90</b>

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**MEDIUM COST FOR BID NO. TIPN-S-05****2AB25 : Fault Recording System****SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)****TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	
2AB25-1	MODIFY EXISTING FAULT RECORDING SYSTEM	See Scope of work		Lump Sum								
				Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	96,630.00	96,630.00	
<b>Total Price for Schedule 2AB25</b>								<b>Baht</b>		<b>Baht</b>		<b>96,630.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB38 : Remote Terminal Unit**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	MODIFY EXISTING REMOTE TERMINAL UNIT	See Scope of work		Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	137,254.00	137,254.00		
<b>Total Price for Schedule 2AB38</b>								<b>Baht</b>		<b>Baht 137,254.00</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**2AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB39-1	Commissioning	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	675,000.00	675,000.00		
<b>Total Price for Schedule 2AB39</b>							<b>Baht</b>		<b>Baht 675,000.00</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**2AB40 : Installation of Equipment and Steel Structure Supplied by EGAT**  
**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2AB40-1	Dismantlement	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	284,750.00	284,750.00		
<b>Total Price for Schedule 2AB40</b>							<b>Baht</b>		<b>Baht 284,750.00</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**2D24 : Spare Parts for Control and Protection System**  
**SUPPLY AND CONSTRUCTION OF 230 KV LAMPHUN 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
2D24-1	BREAKER FAILURE RELAY (50BF+62BF)	Supply for loose part Same type as 50BF Dwg Nos.LN3-E-1.2 sh. 1-3.	1	EACH					121,275.00	121,275.00	6,669.00	6,669.00	
2D24-2	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG )	Supply for loose part Same type as 51. Dwg Nos.MM3-E-1.2 sh. 1-2.	1	EACH					87,047.00	87,047.00	4,787.00	4,787.00	
2D24-3	OVERVOLTAGE RELAY (59N,59C)	Supply for loose part Same type as 59N. Dwg Nos.MM3-E-1.2 sh. 1-2.	1	EACH					97,492.00	97,492.00	5,361.00	5,361.00	
<b>Total Price for Schedule 2D24</b>									<b>Baht</b> <b>305,814.00</b>		<b>Baht</b> <b>16,817.00</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB2 : Distribution Transformer**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB2-1	630 kVA, 22000-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX2801	2						1,051,000.00	2,102,000.00	XXXXX	XXXXX	
3AB2-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB2-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	210,200.00	210,200.00	
<b>Total Price for Schedule 3AB2</b>								<b>Baht</b>	<b>2,102,000.00</b>	<b>Baht</b>	<b>210,200.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB4 : Surge Arrester**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
3AB4-1	396 kV Surge Arrester completed with corona ring, grading ring as per Ratings and Features RF SA9Y11	18		THB	255,000.00	4,590,000.00			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	18					52,000.00	936,000.00	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	552,600.00	552,600.00		
<b>Total Price for Schedule 3AB4</b>				THB	<b>4,590,000.00</b>		<b>Baht 936,000.00</b>		<b>Baht 552,600.00</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB5 : Current Transformer and Junction Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
3AB5-1	22 kV CT, 150 kV BIL, 2000/4000/6000:1//1A & 400/800:1A, 13 kA, oil filled as per Rating and Features RF CT27B9	3		THB	127,000.00	381,000.00			XXXXX	XXXXX		
3AB5-2	Junction Box type CT7 ( for Item No. 3AB5-1 ) as per Dwg. No. TP-E-18.2 and TP-E-18.4	1					42,000.00	42,000.00	XXXXX	XXXXX		
3AB5-3	Junction Box type CT8 ( for bus differential ) as per Dwg. No. TP-E-18.6	2					52,000.00	104,000.00	XXXXX	XXXXX		
3AB5-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB5-1 thru 3AB5-3				XXXXXX	XXXXXX	XXXXXX	XXXXXX	52,700.00	52,700.00		
				THB	381,000.00		Baht		Baht			
<b>Total Price for Schedule 3AB5</b>							146,000.00		52,700.00			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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
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	12		THB	525,350.00	6,304,200.00			XXXXX	XXXXX		
3AB6-2	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	6		THB	525,350.00	3,152,100.00			XXXXX	XXXXX		
3AB6-3	22 kV VT, 150 kV BIL, 22000/√3-110/√3&110/√3 V oil filled as per Ratings and Features RF VT 2012	6		THB	85,000.00	510,000.00			XXXXX	XXXXX		
3AB6-4	Steel Supporting Structure for PD9W11 ( for Item No. 3AB6-1 ), H = 9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	12					49,400.00	592,800.00	XXXXX	XXXXX		
3AB6-5	Steel Supporting Structure for PD9011 ( for Item No. 3AB6-2 ), H = 9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	6					49,400.00	296,400.00	XXXXX	XXXXX		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

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

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB6-6	Junction Box type PT7 ( for Item No. 3AB6-1 ) as per Dwg. No. TP-E-18.5, TP-E-18.1-3/4 and TP-E-18.4	6						36,000.00	216,000.00	XXXXX	XXXXX	
3AB6-7	Junction Box type PT6 ( for Item No. 3AB6-3 ) as per Dwg. No. TP-E-18.1-2/4 ,TP-E-18.1-3/4 and TP-E-18.4	2						23,000.00	46,000.00	XXXXX	XXXXX	
3AB6-8	Cost of Local Transportation, Construction and Installation for Item No. 3AB6-1 thru 3AB6-7	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	1,111,750.00	1,111,750.00	
<b>Total Price for Schedule 3AB6</b>				<b>THB</b>	<b>9,966,300.00</b>		<b>Baht</b>	<b>1,151,200.00</b>		<b>Baht</b>	<b>1,111,750.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB7 : SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB7-1	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. MM3-S-1-01/04, MM3-S-1-02/04, MM3-S-2-01/01 and TYP1-S-3-01/02 (Line No.1 to THA TAKO & Line No.2 to LAMPHUN 3)	1		THB	151,638,723.00	151,638,723.00			XXXXX	XXXXX		
3AB7-2	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. MM3-S-1-01/04, MM3-S-1-02/04, MM3-S-2-01/01 and TYP1-S-3-01/02 (Line No.1 to LAMPHUN 3 & Line to Existing 500kV Substation Bay 2)	1		THB	151,638,723.00	151,638,723.00			XXXXX	XXXXX		
3AB7-3	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) as per Drawing No. MM3-S-1-01/04, MM3-S-1-02/04, MM3-S-2-01/01 and TYP1-S-3-01/02 (Line No.4 to THA TAKO & Line to Existing 500kV Substation Bay 2A)	1		THB	151,638,723.00	151,638,723.00			XXXXX	XXXXX		


  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB7 : SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB7-4	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) (Metal Enclosed Bus) Including VTs and FESes at Main Bus as per Dwg. No. MM3-S-1-01/04, MM3-S-1-02/04, MM3-S-2-01/01 and TYP1-S-3-01/02	1	lot	THB	Included	Included			XXXXX	XXXXX		
3AB7-5	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) (GIB) as per Dwg No. MM3-S-1-01/04, MM3-S-1-02/04, MM3-S-2-01/01 and TYP1-S-3-01/02	1	lot	THB	Included	Included			XXXXX	XXXXX		
3AB7-6	Local control cubicle for IS9450*	9	set	THB	Included	Included			XXXXX	XXXXX		
3AB7-7	Steel Supporting Structure for IS9450*	1	lot	THB	Included	Included			XXXXX	XXXXX		
3AB7-8	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. TIPN-S-05**

**3AB7 : SF6 Gas Insulated Switchgear**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB7-9	Cost of Local Transportation, Construction and Installation for Item No. 3AB7-1 thru 3AB7-8											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	45,491,616.90	45,491,616.90		
	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 3AB7</b>				<b>THB</b>	<b>454,916,169.00</b>		<b>Baht</b>		<b>Baht</b>			
									<b>45,491,616.90</b>			

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

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB9 : Power Circuit Breaker**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	525 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 55 MVar Y-connected five-limbed core type shunt reactor with 110 kV neutral reactor with earthed neutral)	2		THB	5,271,390.00	10,542,780.00			XXXXX	XXXXX		
3AB9-2	525 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 110 kV neutral reactor with earthed neutral)	2		THB	5,271,390.00	10,542,780.00			XXXXX	XXXXX		
3AB9-3	Controlled Switching Device with Control Cable link between Power Circuit Breaker and Controlled Switching Device for Item No. 3AB9-1 and 3AB9-2	4		THB	593,882.00	2,375,528.00			XXXXX	XXXXX		
3AB9-4	Circuit breaker marshalling KIOSK (Design by contractor)	4					321,450.00	1,285,800.00	XXXXX	XXXXX		
3AB9-5	Steel Supporting Structure for CB995R(IEC) (Item No. 3AB9-1 and 3AB9-2)*	4		THB	141,236.00	564,944.00			XXXXX	XXXXX		

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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB9 : Power Circuit Breaker**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB9-6	BLANK SWING RACK PANEL WITH FIXED PLATE AND DIN RAILS for installation Item 3AB9-3 as per Dwg. No. TP-E-10.1	1					102,809.00	102,809.00	XXXXX	XXXXX		
3AB9-7	Cost of Local Transportation, Construction and Installation for Item No. 3AB9-1 thru 3AB9-6											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	2,541,464.10	2,541,464.10		
<b>Total Price for Schedule 3AB9</b>					<b>THB</b>	<b>24,026,032.00</b>	<b>Baht</b>	<b>1,388,609.00</b>	<b>Baht</b>	<b>2,541,464.10</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. TIPN-S-05**  
**3AB10 : Disconnecting Switch**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
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)	4		THB	1,340,632.00	5,362,528.00			XXXXX	XXXXX		
3AB10-2	Steel Supporting Structure for DS99KI as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m (The structure shall be suitable for connecting with an earth fixed point (Item no. 3AB22-6) on the opposite side of grounding blade)	4					275,750.00	1,103,000.00	XXXXX	XXXXX		
3AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB10-1 thru 3AB10-2				XXXXXX	XXXXXX	XXXXXX	XXXXXX	646,552.80	646,552.80		
				THB	5,362,528.00		Baht		Baht			
<b>Total Price for Schedule 3AB10</b>							1,103,000.00		646,552.80			


  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB11 : Power Fuse, Fuse Link and Hook Stick**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB11-1	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	159,044.60	954,267.60			XXXXX	XXXXX		
3AB11-2	Fuse link or refill unit 25E for 22 kV power fuse (standard speed)	6		THB	12,764.40	76,586.40			XXXXX	XXXXX		
3AB11-3	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 above power fuse	1		THB	30,156.50	30,156.50			XXXXX	XXXXX		
3AB11-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB11-1 thru 3AB11-3											
		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	106,101.05	106,101.05		
<b>Total Price for Schedule 3AB11</b>				THB	<b>1,061,010.50</b>		Baht		<b>Baht 106,101.05</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB12 : AC&DC Distribution Board and Termination Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB12-1	400/230 Vac Load Center Unit Substation (LCUS) as per Dwg. No. TP-418, TYP1-L-5-01-01 and Ratings and Features RF No. LVCB	1					1,236,250.00	1,236,250.00	XXXXX	XXXXX
3AB12-2	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					137,137.00	137,137.00	XXXXX	XXXXX
3AB12-3	Safety switch 600 Vac 1000 A, 4 wire, solid neutral (S/N), 3 blades, 3 fuses time lag type, outdoor NEMA 4X enclosure or higher, completed with 1000 A fuses.	2					258,301.00	516,602.00	XXXXX	XXXXX
3AB12-4	Termination Box type TB1 as per Dwg No. LT-TB-0-01	12					4,265.00	51,180.00	XXXXX	XXXXX
3AB12-5	Outdoor Receptacle Box type ORB1 as per Dwg. No. SE-ORB-0-01(for oil separator)	1					18,664.00	18,664.00	XXXXX	XXXXX
3AB12-6	Outdoor Receptacle Box type ORB3 as per Dwg. No. SE-ORB-0-01(for general purpose)	1					38,198.00	38,198.00	XXXXX	XXXXX
3AB12-7	Molded Case Selector Switch 125Vdc as per DWG. No. TYP1A-L-5-01/01	1					48,615.00	48,615.00	XXXXX	XXXXX

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB12 : AC&DC Distribution Board and Termination Box**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB12-8	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4	2					197,970.00	395,940.00	XXXXX	XXXXX		
3AB12-9	125 Vdc Power Panel as per Dwg. No. TP-E-4.4	2					233,188.00	466,376.00	XXXXX	XXXXX		
3AB12-10	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4	4					142,168.00	568,672.00	XXXXX	XXXXX		
3AB12-11	Cost of Local Transportation, Construction and Installation for Item No. 3AB12-1 thru 3AB12-10					XXXXX	XXXXX	XXXXX	XXXXX	347,763.40	347,763.40	
<b>Total Price for Schedule 3AB12</b>								<b>Baht</b> <b>3,477,634.00</b>	<b>Baht</b> <b>347,763.40</b>			


  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB13 : Stationary Battery and Battery Charger**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB13-1	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)											
3AB13-1a	a) Battery	2	set	THB	1,398,100.00	2,796,200.00			XXXXX	XXXXX		
3AB13-1b	b) Electrolyte	2	set	THB	22,821.91	45,643.82			XXXXX	XXXXX		
3AB13-1c	c) Battery Rack	2	set	THB	85,582.14	171,164.28			XXXXX	XXXXX		
3AB13-2	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. 3AB13-1	3					674,300.00	2,022,900.00	XXXXX	XXXXX		
3AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB13-1 thru 3AB13-2											
		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	503,590.81	503,590.81		
<b>Total Price for Schedule 3AB13</b>												
				<b>THB</b>	<b>3,013,008.10</b>		<b>Baht</b>		<b>Baht</b>			
							<b>2,022,900.00</b>		<b>503,590.81</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB14-1	500 kV take-off structure (ST-1) as per Dwg. No. EHVS4/CHA107 SH.01/03, 02/03, 03/03	11					1,941,019.74	21,351,217.14	XXXXX	XXXXX		
3AB14-2	500 kV beam (B1-2) as per Dwg. No. EHVS4/CHA108 SH.01/02, 02/02	6					1,762,127.09	10,572,762.54	XXXXX	XXXXX		
3AB14-3	22 kV bus support structure (BS203) as per Dwg. No. ST-BS-2-03	1					72,815.17	72,815.17	XXXXX	XXXXX		
3AB14-4	22 kV current transformer support structure (CS201) as per Dwg. No. ST-CS-2-01	1					118,400.05	118,400.05	XXXXX	XXXXX		
3AB14-5	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	12					10,771.47	129,257.64	XXXXX	XXXXX		
3AB14-6	Telecommunication Tower Type WSA (H = 30.00 m) as per Dwg. UWC-06-WSA-501,502,503&504	1					448,093.35	448,093.35	XXXXX	XXXXX		
3AB14-7	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	2					9,478.90	18,957.80	XXXXX	XXXXX		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB14 : Substation Steel Structure**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB14-8	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	2					7,324.60	14,649.20	XXXXX	XXXXX		
3AB14-9	Cost of Local Transportation, Construction and Installation for Item No. 3AB14-1 thru 3AB14-8	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	8,181,538.22	8,181,538.22		
<b>Total Price for Schedule 3AB14</b>							<b>Baht 32,726,152.89</b>		<b>Baht 8,181,538.22</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB15 : Insulator**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	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		
3AB15-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB15-1 thru 3AB15-2	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	114,015.00	114,015.00		
<b>Total Price for Schedule 3AB15</b>								<b>Baht</b>		<b>114,015.00</b>		



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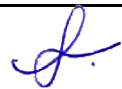
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB16 : Cable Terminations**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB16-1	22 kV cable terminations for 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF TN212H	6		THB	5,453.80	32,722.80			XXXXX	XXXXX		
3AB16-2	Cable Cleats with necessary miscellaneous hardware for Item No. 3AB17-1 TREFOIL formation 3-phase per as per Ratings and Features RF TNAC1 (design by contractor)	lump sum	lump sum	THB	1,024,144.00	1,024,144.00			XXXXX	XXXXX		
3AB16-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB16-1 thru 3AB16-2	lump sum	lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	264,216.70	264,216.70		
<b>Total Price for Schedule 3AB16</b>				<b>THB</b>	<b>1,056,866.80</b>		<b>Baht</b>		<b>Baht 264,216.70</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB17 : XLPE Power Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB17-1	22 kV 1/C no. 35 sq.mm. XLPE power cable as per Ratings and Features RF PC2110											
		lump sum	lump sum					1,678,600.00	1,678,600.00	XXXXX	XXXXX	
3AB17-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB17-1											
		lump sum	lump sum		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	419,650.00	419,650.00	
<b>Total Price for Schedule 3AB17</b>								<b>Baht</b>	<b>1,678,600.00</b>	<b>Baht</b>	<b>419,650.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB18 : Low Voltage Cable and Conductor**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB18-1	750 V power cable as per Specification attached	lump sum	lump sum				13,263,074.00	13,263,074.00	XXXXX	XXXXX		
3AB18-2	600 V control cable with PVC insulation as per Specification attached	lump sum	lump sum				76,246,791.50	76,246,791.50	XXXXX	XXXXX		
3AB18-3	750 V lighting cable (THW) as per Specification attached	lump sum	lump sum				16,500.00	16,500.00	XXXXX	XXXXX		
3AB18-4	750 V lighting cable (NYY) as per Specification attached	lump sum	lump sum				4,442,790.00	4,442,790.00	XXXXX	XXXXX		
3AB18-5	Annealed copper ground wire as per Specification attached	lump sum	lump sum				25,207,117.65	25,207,117.65	XXXXX	XXXXX		
3AB18-6	Aluminum conductor as per Specification attached	lump sum	lump sum				674,234.88	674,234.88	XXXXX	XXXXX		
3AB18-7	Cost of Local Transportation, Construction and Installation for Item No. 3AB18-1 thru 3AB18-6	lump sum	lump sum			XXXXX	XXXXX	XXXXX	XXXXX	29,962,627.01	29,962,627.01	
<b>Total Price for Schedule 3AB18</b>							<b>Baht 119,850,508.03</b>		<b>Baht 29,962,627.01</b>			

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB19 : Switchyard Lighting Fixtures**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	24					15,082.10	361,970.40	XXXXX	XXXXX		
3AB19-2	Street lighting fixture, LED lamp, 5000 lumen, wide beam, complete with control gear as per Specification attached	53					14,686.10	778,363.30	XXXXX	XXXXX		
3AB19-3	Tapered galvanized steel lamp post H=5000 mm. complete with 5 A 250 V plug fuse, 20 A 500 V terminal block for accepting 4 sq.mm. of incoming and outgoing cables and anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	53					18,782.50	995,472.50	XXXXX	XXXXX		
3AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 3AB19-1 thru 3AB19-3		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	533,951.55	533,951.55	
<b>Total Price for Schedule 3AB19</b>										<b>Baht</b>	<b>Baht</b>	
								<b>2,135,806.20</b>		<b>533,951.55</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB20 : Aluminum Tube, Connector and Miscellaneous Hardware**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB20-1	Aluminum tube as per Specification attached	Lump sum	Lump sum				336,497.70	336,497.70	XXXXX	XXXXX		
3AB20-2	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	452,865.60	452,865.60			XXXXX	XXXXX		
3AB20-3	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	162,360.00	162,360.00			XXXXX	XXXXX		
3AB20-4	230 kV and below Compression connector as per Specification attached	Lump sum	Lump sum				Included in 1AB20-2	Included in 1AB20-2	XXXXX	XXXXX		
3AB20-5	230 kV and below Miscellaneous hardware as per Specification attached	Lump sum	Lump sum				Included in 1AB20-2	Included in 1AB20-2	XXXXX	XXXXX		
3AB20-6	Cost of Local Transportation, Construction and Installation for Item No. 3AB20-1 thru 3AB20-5	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	237,930.83	237,930.83		
<b>Total Price for Schedule 3AB20</b>						<b>615,225.60</b>	<b>Baht</b>	<b>336,497.70</b>	<b>Baht</b>	<b>237,930.83</b>		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB21 : Bus Fitting**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	1,329,733.01	1,329,733.01			XXXXX	XXXXX		
3AB21-2	230 kV and below Bus fitting as per Specification attached	Lump sum	Lump sum	THB	396,981.78	396,981.78			XXXXX	XXXXX		
3AB21-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB21-1 thru 3AB21-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	431,678.70	431,678.70		
<b>Total Price for Schedule 3AB21</b>				THB	<b>1,726,714.79</b>		Baht		<b>Baht 431,678.70</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB22 : Grounding Material**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	313,075.59	313,075.59			XXXXX	XXXXX		
3AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				2,438,782.99	2,438,782.99	XXXXX	XXXXX		
3AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	1,343,968.20	1,343,968.20			XXXXX	XXXXX		
3AB22-4	Portable temporary grounding tools for maintenance as per Specification attached	1	set	THB	430,080.02	430,080.02			XXXXX	XXXXX		
3AB22-5	Disconnecting switch safety Mats	12					11,595.33	139,143.96	XXXXX	XXXXX		
3AB22-6	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	493,689.20	493,689.20			XXXXX	XXXXX		
3AB22-7	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	1	set	THB	752,640.63	752,640.63			XXXXX	XXXXX		
3AB22-8	Cost of Local Transportation, Construction and Installation for Item No. 3AB22-1 thru 3AB22-7	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,477,845.15	1,477,845.15		
<b>Total Price for Schedule 3AB22</b>				THB	<b>3,333,453.64</b>		<b>Baht 2,577,926.95</b>		<b>Baht 1,477,845.15</b>			

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB23 : Substation Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				237,413.00	237,413.00	XXXXX	XXXXX		
3AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	191,780.60	191,780.60			XXXXX	XXXXX		
3AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum				128,887.20	128,887.20	XXXXX	XXXXX		
3AB23-4	Heat shrinkable insulation material as per Specification attached	Lump sum	Lump sum	THB	59,612.30	59,612.30			XXXXX	XXXXX		
3AB23-5	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				402,435.00	402,435.00	XXXXX	XXXXX		
3AB23-6	Cost of Local Transportation, Construction and Installation for Item No. 3AB23-1 thru 3AB23-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	255,032.03	255,032.03		
				<b>THB</b>	<b>251,392.90</b>		<b>Baht</b>		<b>Baht</b>			
<b>Total Price for Schedule 3AB23</b>							<b>768,735.20</b>		<b>255,032.03</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 BUS PROTECTION (LOW IMPEDANCE, NO SWITCHING ZONE, 6 feeders)	Panel Nos. 1R, 3R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	2	SET			995,778.00	1,991,556.00	XXXXX	XXXXX			
3AB24-2	500 kV BUS PROTECTION (LOW IMPEDANCE, NO SWITCHING ZONE, 6 feeders)	Panel Nos. 2R, 4R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	2	SET			995,778.00	1,991,556.00	XXXXX	XXXXX			
3AB24-3	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos. 5R, 8R, 11R, 16R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	4	EACH			1,366,098.00	5,464,392.00	XXXXX	XXXXX			
3AB24-4	500 kV LINE PROTECTION (21P, 24L, 1-BF)	Panel Nos. 9R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	1	EACH			1,436,287.00	1,436,287.00	XXXXX	XXXXX			

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB24-5	500 kV LINE PROTECTION (21P, 24L, 2-BF)	Panel Nos. 6R, 12R, 17R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	3	EACH			1,567,734.00	4,703,202.00	XXXXX	XXXXX			
3AB24-6	500 kV SHUNT REACTOR PROTECTION	Panel Nos. 7R, 10R, 13R, 18R. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	4	EACH			976,515.00	3,906,060.00	XXXXX	XXXXX			
3AB24-7	500 kV LINE PROTECTION (87B-6 Feeders, DTT)	Panel Nos. 14R, 19R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	2	EACH			1,042,366.00	2,084,732.00	XXXXX	XXXXX			
3AB24-8	500 kV LINE PROTECTION (87B-6 Feeders, 1-BF, DTT)	Panel Nos. 15R, 20R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-2, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	2	EACH			1,202,555.00	2,405,110.00	XXXXX	XXXXX			

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB24-9	500 kV TRIP CIRCUIT SUPERVISION (6-BKR)	Panel Nos. 21R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	1	EACH			605,638.00	605,638.00	XXXXX	XXXXX			
3AB24-10	500 kV TRIP CIRCUIT SUPERVISION (3-BKR)	Panel Nos. 22R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	1	EACH			538,406.00	538,406.00	XXXXX	XXXXX			
3AB24-11	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel Nos. S1, S2, S3 Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-2, MM3-E-3.1 sh. 1-3 and TP-E-10.1.	3	EACH			617,885.00	1,853,655.00	XXXXX	XXXXX			
3AB24-12	INTERPOSING PANEL TYPE IP7	Panel No. IP1, IP2 Drawing Nos. MM3-E-1.1 sh. 1-3, TP-E-6.4 sh. 1/6, TP-E- 6.4 sh. 2/6, TP-E-6.4 sh. 3/6, TP-E-6.4 sh. 4/6, TP-E-6.4 sh. 5/6 and TP-E-6.4 sh. 6/6.	2	EACH			1,136,404.00	2,272,808.00	XXXXX	XXXXX			

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**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel No. MPC1, MPC2, MPC3 Drawing Nos. MM3-E-1.1 sh. 1-3 and TP-E-10.3.	3	EACH					383,817.00	1,151,451.00	XXXXX	XXXXX	
3AB24-14	MARSHALLING PANEL FOR TELEPROTECTION (500 kV)	Panel No. MP-TELE1 Drawing Nos. MM3-E-1.1 sh. 1, TP-E-10.3 DW-TPS-D01-112-01 SH. P1-P7 and DW-TPS-D01-115-01 SH. P1-P6	1	EACH					395,509.00	395,509.00	XXXXX	XXXXX	
3AB24-15	MARSHALLING PANEL FOR FRS	Panel No. MP-FRS1 Drawing Nos. MM3-E-1.1 sh. 1-3 and TP-E-10.3.	1	EACH			Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX	
3AB24-16	MARSHALLING PANEL FOR RTU	Panel No. MP-RTU1, MP-RTU2, MP-RTU3 Drawing Nos. MM3-E-1.1 sh. 1-3 and TP-E-10.3.	3	EACH			Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB24 : Control and Protection System**

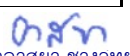
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB24-17	TRANSDUCER PANEL	Panel No. TDR1 including 1-Temp TDR, 1-AC-TDR, 3-DC-TDR, 8-V-TDR 1 ph., 2-F-TDR 1ph., 4-W&VAR TDR and 4-TS. Drawing Nos. MM3-E-1.1 sh. 1-3 and TP-E-10.2.	1	EACH				699,623.00	699,623.00	XXXXX	XXXXX		
3AB24-18	GPS RECEIVER PANEL	GPS Receiver Panel. The Ethernet ports not less than 80 ports. Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-2.1 sh. 1-3 and TP-E-10.15. Spec No. 1002, SD-FOT-P22.	1	SET				817,680.00	817,680.00	XXXXX	XXXXX		
3AB24-19	TRANSFORMER DIFFERENTIAL RELAY (87K, 6 restraint windings)	Installed in Panel Nos. 308R, 309R Drawing Nos. MM3-E-1.1 sh. 1-3 and MM3-E-2.1 sh. 3.	2	EACH				872,901.00	1,745,802.00	XXXXX	XXXXX		

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**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	Unit Price	Amount						
3AB24-20	TEST SWITCH (TS, for relays)	Installed in Panel Nos. 308R, 309R, 405R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-1.2 sh. 1-2, MM3-E-2.1 sh. 3 and MM3-E-2.2 sh. 1.	5	EACH				6,962.00	34,810.00	XXXXXX	XXXXXX				
3AB24-21	OVERVOLTAGE RELAY (59N,59C)	Installed in Panel Nos. 308R, 405R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-1.2 sh. 1-2, MM3-E-2.1 sh. 3 and MM3-E-2.2 sh. 1.	2	EACH				97,492.00	194,984.00	XXXXXX	XXXXXX				
3AB24-22	DC UNDERVOLTAGE RELAY (27XB,27XR)	Installed in Panel Nos. 308R, 405R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-1.2 sh. 1-2, MM3-E-2.1 sh. 3 and MM3-E-2.2 sh. 1.	2	EACH				6,845.00	13,690.00	XXXXXX	XXXXXX				



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**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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	Unit Price	Amount						
3AB24-23	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Installed in Panel No. 405R Drawing Nos. MM3-E-1.1 sh. 1-3, MM3-E-1.2 sh. 1-2, MM3-E-2.1 sh. 3 and MM3-E-2.2 sh. 1.	1	EACH				87,047.00	87,047.00	XXXXX	XXXXX				

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**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB24-24	SYNCHRONIZING PANEL FOR 14 BREAKERS OF BREAKER AND A HALF	Panel Nos. S4. Drawing Nos. MM3-E-1.2 sh. 1-2, MM3-E-2.1 sh. 2, and TP-E-10.1.	1	EACH					666,356.00	666,356.00	XXXXX	XXXXX	
3AB24-25	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel Nos. S5. Drawing Nos. MM3-E-1.3 sh. 1, MM3-E-2.1 sh. 2, and TP-E-10.1.	1	EACH					617,885.00	617,885.00	XXXXX	XXXXX	
3AB24-26	METERING PANEL ( 6 kWh&kVarh METERS)	Panel Nos. MP2. Drawing Nos. MM3-E-1.3 sh. 1, MM3-E-2.3 sh. 1, and TP-E-10.1.	1	EACH					2,145,549.00	2,145,549.00	XXXXX	XXXXX	
3AB24-27	METERING PANEL ( 4 kWh&kVarh METERS)	Panel Nos. MP1, MP3. Drawing Nos. MM3-E-1.4 sh. 1, MM3-E-2.3 sh. 1, and TP-E-10.1.	2	EACH					1,659,884.00	3,319,768.00	XXXXX	XXXXX	
3AB24-28	MODIFY THE EXISTING CONTROL AND PROTECTION SYSTEM	Scope of work	Lump sum	Lump sum					XXXXX	XXXXX	XXXXX	XXXXX	
											492,329.00	492,329.00	

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB24 : Control and Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB24-29	Cost of Local Transportation, Construction and Installation for Item No. 3AB24-1 thru 3AB24-27		Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	4,416,063.00	4,416,063.00		
<b>Total Price for Schedule 3AB24</b>								<b>Baht</b>	<b>41,143,556.00</b>	<b>Baht</b>	<b>4,908,392.00</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB25 : Fault Recording System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB25-1	FAULT RECORDING SYSTEM, 80 ANALOG INPUT, 400 DIGITAL INPUT.	Panel no. FRS1, FRS2. Drawing Nos. MM3-E-1.1 sh. 1-3.	1	SET			5,385,619.00	5,385,619.00	XXXXX	XXXXX			
3AB25-2	MODIFY THE EXISTING FAULT RECORDING SYSTEM	See scope of work.	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	202,434.00	202,434.00		
3AB25-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB25-1		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	592,417.00	592,417.00		
<b>Total Price for Schedule 3AB25</b>								<b>Baht</b>	<b>5,385,619.00</b>	<b>Baht</b>	<b>794,851.00</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB33 : CCTV**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB33-1	CCTV System and accessories including:	1	SET				4,490,276.00	4,490,276.00	XXXXX	XXXXX		
	(1) Outdoor PTZ Dome Camera (2 EA) (2) Indoor Fixed Camera (14 EA) (3) Outdoor Fixed Camera (18 EA) (4) PC Workstation (1 SET) (5) Server (1 SET) (6) Software license (6.1) Software management license (1 Licenses) (6.2) Redording license (34 Licenses) (6.3) Video analytic license (34 Licenses) (7) Ethernet I/O Module (1 EA) (8) Monitor (6 EA) (9) HDMI Optical Extender (3 SET) (10) LAN Switch (2 EA) (11) CCTV Rack Cabinet (1 EA) Size: 60x60x218.5cm. Front door: Steel sheet with Plastic Acrylic Rear door: Perforated steel sheet											

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**3AB33 : CCTV**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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
	(12) CCTV steel box/ End-point steel box (Lumpsum)									
	(13) Monitoring Desk (1 EA)									
	(14) PoE Injector for Fixed camera (32 EA)									
	(15) Adapter for PTZ camera (2 EA)									
	(16) CCTV Pole 2 เมตร (Lumpsum)									
	(17) CCTV Pole 4 เมตร (Lumpsum)									
	(18) Indoor-type twisted pair cable (Lumpsum)									
	(19) Outdoor-type twisted pair cable (Lumpsum)									
	(20) 12-core ADSS Optical Fiber Cable (Lumpsum)									
	(21) Media Converter (UTP-Fiber Optic) (20 SET)									
	(22) Surge protection-220VAC (11 EA)									
	(23) Line Filter (11 EA)									
	(24) สายไฟฟ้า (Lumpsum)									
	(25) ท่อ EMT (Lumpsum)									
	(26) ท่อ IMC, เหล็กอ่อนกันน้ำมี PVC หุ้ม (Lumpsum)									
	(27) E-flex (Lumpsum)									
	(28) Ground System (Lumpsum)									
	(29) Accessories (Lumpsum)									

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB33 : CCTV**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB33-2	Cost of Local Transportation, Construction and Installation for Item no. 3AB33-1	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	567,573.00	567,573.00		
	<p><b>IMPORTANT :</b></p> <p>1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration.</p> <p>2. Telecommunication Equipment supplied under Schedule 3AB33 shall conform to Specification No. SD-CCTV-P01, Drawing No. DW-COM-D01-007-ALL and DW-CAB-D01-019</p>											
<b>Total Price for Schedule 3AB33</b>							<b>Baht 4,490,276.00</b>		<b>Baht 567,573.00</b>			



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**MEDIUM COST FOR BID NO. TIPN-S-05**


**3AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB34-1	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 800 Ah (Tubular plate) at 10 Hour rated, 24 Cells, Norminal Voltage 2 Volts/Cell, with Rack 1 set (500 kV Mae Moh 3 Control Building-1)	1	SET					499,000.00	499,000.00	XXXXX	XXXXX	
3AB34-2	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 400 Ah (Tubular plate) at 10 Hour rated, 24 Cells, Norminal Voltage 2 Volts/Cell, with Rack 1 set (500 kV Mae Moh 3 Control Building-2)	2	SET					279,000.00	558,000.00	XXXXX	XXXXX	
3AB34-3	Conventional Type Charger 48VDC, 300 A (500 kV Mae Moh 3 Control Building-4)	4	SET					595,200.00	2,380,800.00	XXXXX	XXXXX	
3AB34-4	48Vdc. Load Center Type1: 60 Breaker (500 kV Mae Moh 3 Control Building-3)	3	SET					154,000.00	462,000.00	XXXXX	XXXXX	


  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB34-5	Local Transportation, Construction and Installation for item 3AB34-1, 3AB34-2, 3AB34-3 and 3AB34-4	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	295,000.00	295,000.00		
<b>Total Price for Schedule 3AB34</b>									<b>Baht 3,899,800.00</b>	<b>Baht 295,000.00</b>		

  
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 22 Apr 2022

  
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 หจตส-ท.  
 10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-1	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way joint box at Tha Tako (Line No.1, 4) take-off structure</b>											
3AB35-1.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 350 meters) (b) Rigid steel conduit 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 (500 kV MM3 control building-1 set) (e) Fiber frame termination cabinet with cable tray (500 kV MM3 control building-1 set) (f) 36 Pigtailes (1.5 meters) (500 kV MM3 control building-1 set) (g) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					124,070.00	124,070.00	XXXXX	XXXXX	
3AB35-1.2	Local transportation, Construction and Installation for item 3AB35-1.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	203,920.00	203,920.00	

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10 มี.ย. 2565



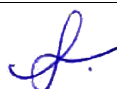
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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			
3AB35-2 3AB35-2.1	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way joint box at Bay 2 line to existing Mae Moh 3 substation</b> 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					102,410.00	102,410.00	XXXXX	XXXXX		
3AB35-2.2	Local transportation, Construction and Installation for item 3AB35-2.1 (Including splicing work and field testing for optical fiber)	1	JOB					XXXXX	XXXXX	XXXXX	XXXXX	194,290.00	194,290.00



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22 Apr 2022



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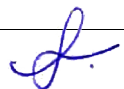
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-3 3AB35-3.1	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way joint box at Bay 2A line to existing Mae Moh 3 substation</b> 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					102,410.00	102,410.00	XXXXX	XXXXX	
3AB35-3.2	Local transportation, Construction and Installation for item 3AB35-3.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	194,290.00	194,290.00	



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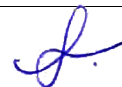
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-4	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way joint box at Lamphun 3 (LN3) take-off structure</b>											
3AB35-4.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 400 meters) (b) Rigid steel conduit 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					112,910.00	112,910.00	XXXXX	XXXXX	
3AB35-4.2	Local transportation, Construction and Installation for item 3AB35-4.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	210,790.00	210,790.00	



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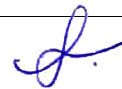
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-5	<b>Optical fiber cable from fiber frame termination cabinet at Communication Room (ZD) at operation building to 2-way joint box at 500 kV Mae Moh 3 take-off structure at existing substation</b>											
3AB35-5.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 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 (ZD-1 set) (e) 36 Pigtails (1.5 meters) (ZD-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					259,910.00	259,910.00	XXXXX	XXXXX	
3AB35-5.2	Local transportation, Construction and Installation for item 3AB35-5.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	441,790.00	441,790.00	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-6	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Nan (NA) take-off structure</b>											
3AB35-6.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,200 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 (500 kV MM3 control building-1 set) (e) Fiber frame termination cabinet with cable tray (500 kV MM3 control building-1 set) (f) 36 Pigtailes (1.5 meters) (500 kV MM3 control building-1 set) (g) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					302,570.00	302,570.00	XXXXX	XXXXX	
3AB35-6.2	Local transportation, Construction and Installation for item 3AB35-6.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	484,420.00	484,420.00	

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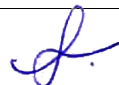
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-7	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Chiang Rai (CR) dead-end tower</b>											
3AB35-7.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,300 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) Fiber frame termination cabinet with cable tray (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					301,910.00	301,910.00	XXXXX	XXXXX	
3AB35-7.2	Local transportation, Construction and Installation for item 3AB35-7.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	507,790.00	507,790.00	



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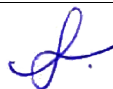
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-8	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Chiang Mai 3 (CM3) take-off structure</b>											
3AB35-8.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,200 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					280,910.00	280,910.00	XXXXX	XXXXX	
3AB35-8.2	Local transportation, Construction and Installation for item 3AB35-8.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	474,790.00	474,790.00	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-9	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Mae Moh 4 (MM4) take-off structure</b>											
3AB35-9.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					259,910.00	259,910.00	XXXXX	XXXXX	
3AB35-9.2	Local transportation, Construction and Installation for item 3AB35-9.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXXX	XXXXXX	XXXXXX	XXXXXX	XXXXXX	441,790.00	441,790.00	

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-10	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Phayao (PY) dead-end tower</b>											
3AB35-10.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,200 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					280,910.00	280,910.00	XXXXX	XXXXX	
3AB35-10.2	Local transportation, Construction and Installation for item 3AB35-10.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	474,790.00	474,790.00	

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**MEDIUM COST FOR BID NO. TIPN-S-05**


**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-11	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Phrae (PR) take-off structure</b>											
3AB35-11.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					259,910.00	259,910.00	XXXXX	XXXXX	
3AB35-11.2	Local transportation, Construction and Installation for item 3AB35-11.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	441,790.00	441,790.00	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-12	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Mae Moh Mine (MMM) take-off structure</b>											
3AB35-12.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					259,910.00	259,910.00	XXXXX	XXXXX	
3AB35-12.2	Local transportation, Construction and Installation for item 3AB35-12.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	441,790.00	441,790.00	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-13	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to 2-way jonit box at Lampang 2 (LP2) take-off structure</b>											
3AB35-13.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 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 (500 kV MM3 control building-1 set) (e) 36 Pigtails (1.5 meters) (500 kV MM3 control building-1 set) (f) 6-wire cleat for coiling optical fiber cable (4 set)	1	LOT					259,910.00	259,910.00	XXXXX	XXXXX	
3AB35-13.2	Local transportation, Construction and Installation for item 3AB35-13.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	441,790.00	441,790.00	

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**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-14	<b>Optical fiber cable from fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.6</b>											
3AB35-14.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,100 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Rack cabinet and accessories (500 kV MM3 control building-1 set) (d) Fiber frame termination cabinet with cable tray (500 kV MM3 control building-1 set, MM3 relay building no.6-1 set) (e) 36 Pigtaills (1.5 meters) (500 kV MM3 control building-1 set, MM3 relay building no.6-1 set)	1	LOT					281,760.00	281,760.00	XXXXX	XXXXX	
3AB35-14.2	Local transportation, Construction and Installation for item 3AB35-14.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	470,700.00	470,700.00	

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**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-15	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.6 to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.5</b>											
3AB35-15.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 550 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.6-1 set, MM3 relay building no.5-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.6-1 set, MM3 relay building no.5-1 set)	1	LOT					144,600.00	144,600.00	XXXXX	XXXXX	
3AB35-15.2	Local transportation, Construction and Installation for item 3AB35-15.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	279,570.00	279,570.00	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-16	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.5 to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.4</b>											
3AB35-16.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 250 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.5-1 set, MM3 relay building no.4-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.5-1 set, MM3 relay building no.4-1 set)	1	LOT					81,600.00	81,600.00	XXXXX	XXXXX	
3AB35-16.2	Local transportation, Construction and Installation for item 3AB35-16.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	180,570.00	180,570.00	



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**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-17	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.4 to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.1</b>											
3AB35-17.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 1,000 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.4-1 set, MM3 relay building no.1-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.4-1 set, MM3 relay building no.1-1 set)	1	LOT					239,100.00	239,100.00	XXXXX	XXXXX	
3AB35-17.2	Local transportation, Construction and Installation for item 3AB35-17.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	428,070.00	428,070.00	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-18	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.1 to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.2</b>											
3AB35-18.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 300 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.1-1 set, MM3 relay building no.2-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.1-1 set, MM3 relay building no.2-1 set)	1	LOT					92,100.00	92,100.00	XXXXX	XXXXX	
3AB35-18.2	Local transportation, Construction and Installation for item 3AB35-18.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	197,070.00	197,070.00	



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**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-19	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.2 to fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.3</b>											
3AB35-19.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 250 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.2-1 set, MM3 relay building no.3-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.2-1 set, MM3 relay building no.3-1 set)	1	LOT					81,600.00	81,600.00	XXXXX	XXXXX	
3AB35-19.2	Local transportation, Construction and Installation for item 3AB35-19.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	180,570.00	180,570.00	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB35-20	<b>Optical fiber cable from fiber frame termination cabinet at Mae Moh 3 (MM3) relay building no.3 to fiber frame termination cabinet at 500 kV Mae Moh 3 (MM3) control building</b>											
3AB35-20.1	Supply of optical fiber cable and accessories including: (a) 36-core non-metallic optical fiber cable (approx. 700 meters) (b) EFLEX and/or HDPE conduit with hot-dip galvanized steel clamp (lump sum) (c) Fiber frame termination cabinet with cable tray (MM3 relay building no.3-1 set, 500 kV MM3 control building-1 set) (d) 36 Pigtails (1.5 meters) (MM3 relay building no.3-1 set, 500 kV MM3 control building-1 set)	1	LOT				176,100.00	176,100.00	XXXXXX	XXXXXX		



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB35 : Communication Cable**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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		
3AB35-20.2	Local transportation, Construction and Installation for item 3AB35-20.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	329,070.00	329,070.00		
	<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</b>	<b>4,004,510.00</b>	<b>Baht</b>	<b>7,019,650.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**


**3AB38 : Remote Terminal Unit**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB38-1	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	This item include installation and configuration software. Installed at Control Room. 1-for 500kV and 1-for 230/115kV.	2	SET		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
3AB38-2	EGAT RTU TYPE 621M	Panel No. RTU1 Installed at Control Room.	1	EACH		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
3AB38-3	EGAT RTU TYPE 16D	Panel No. RTU2, RTU3 Installed at Control Room.	2	EACH		Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	Supplied By EGAT	XXXXX	XXXXX		
3AB38-4	MODIFY THE EXISTING REMOTE TERMINAL UNIT	See scope of work.	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	137,254.00	137,254.00		

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3AB38 : Remote Terminal Unit**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3AB38-5	Cost of Local Transportation, Construction and Installation for Item No. 3AB38-1 thru 3AB38-3		Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,544,758.00	1,544,758.00		
<b>Total Price for Schedule 3AB38</b>									<b>Baht</b>	<b>Baht</b>	<b>1,682,012.00</b>		



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**MEDIUM COST FOR BID NO. TIPN-S-05**


**3AB39 : Commissioning**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and (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		
3AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	4,998,000.00	4,998,000.00		
<b>Total Price for Schedule 3AB39</b>							<b>Baht</b>		<b>Baht 4,998,000.00</b>			

  
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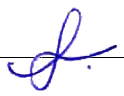
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 Take off structure foundation ( TS901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-TS-9-01, SD-PL-0-01, See Scope of work	11	set	1,047,539.00	11,522,929.00
3C1-2	500 kV Voltage transformer support structure foundation ( VT901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-VT-9-01, SD-PL-0-01, See Scope of work	18	set	51,477.00	926,586.00
3C1-3	500 kV Disconnecting switch foundation ( DS901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-DS-9-01, SD-PL-0-01, See Scope of work	12	set	310,238.00	3,722,856.00
3C1-4	500 kV Power circuit breaker foundation ( CB901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, MM3-CB-9-01, SD-PL-0-01, See Scope of work	12	set	287,567.00	3,450,804.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-5	500 kV Lightning arrester support structure foundation (LA901) Pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-SA-9-01, SD-PL-0-01, See Scope of work	18	set	51,477.00	926,586.00
3C1-6	500 kV GIB Air bushing support structure foundation (BT901) pile Type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, TT/KK4-GTS-9-01, SD-PL-0-01, See Scope of work	18	set	46,466.00	836,388.00
3C1-7	500 kV GIB support structure foundation ( Pile type ) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, See Scope of work	Lump Sum	Lump Sum	1,817,846.00	1,817,846.00
3C1-8	500 kV Shunt reactor foundation ( SR901 ) and oil pit (pile type) (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, TT/KK4-SR-9-01, SD-PL-0-01, See Scope of work	4	set	972,397.00	3,889,588.00

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-9	500 kV Neutral reactor foundation ( NR901 ) pile type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-SNR-9-01, SD-PL-0-01, See Scope of work	4	set	70,766.00	283,064.00
3C1-10	Outdoor receptable box foundation (ORB) Pad type	Designed by Contractor	2	set	42,717.00	85,434.00
3C1-11	30m Telecommunication Tower Foundation(WSA.) Pile , Bored pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-TT-0-08 01/01	1	set	261,494.00	261,494.00
3C1-12	22 kV Bus support structure foundation (BS201,BS202,BS203,BS204) Pile Type(BS203 only)(Dowel bar , Pile cut off and Pile shoe are included)	FD-BS-2-02 01/01	1	set	26,941.00	26,941.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-13	22kV CT support foundation (CS201) pile Type (Dowel bar , Pile cut off and Pile shoe are included)	Designed by Contractor, RE2-CS-2-01, SD-PL-0-01, See Scope of work	1	set	57,049.00	57,049.00
3C1-14	Disconnecting Switch Operating Platform foundation (OP002)	FD-OP-0-02 01/01	12	set	2,725.00	32,700.00
3C1-15	Circuit breaker marshalling kiosk foundation ( MK ) pad type	Designed by Contractor, 1WAU624795-AGT See Scope of work	4	set	14,986.00	59,944.00
3C1-16	22&33 kV Distribution Transformer foundation (DX402) Short Pile Type (Dowel bar , Pile cut off and Pile shoe are included)	FD-DX-4-02 01/01	2	set	21,019.00	42,038.00
3C1-17	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05 01/01	2	set	7,268.00	14,536.00

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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C1 : Foundation Work**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C1-18	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03 01/01	2	set	8,560.00	17,120.00
3C1-19	Lighting Relay Panel foundation(RP002) Pad Type	FD-RP-0-03 01/01	1	set	6,959.00	6,959.00
3C1-20	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type(LP)(Dowel bar , Pile cut off and Pile shoe are included)	FD-LP-0-05 01/01, SD-PL-0-01, See Scope of work	53	set	24,255.00	1,285,515.00
<b>Total Price for Schedule 3C1</b>					<b>Baht</b>	<b>29,266,377.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**


**3C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 - 01/02, SD-CE-0-02 - 02/02 See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	5,709,161.00	5,709,161.00
3C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 - 01/02, SD-CE-0-02 - 02/02 See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	120,323.00	120,323.00
3C2-3	Cable trench, steel cover included (Type"A")	Designed by Contractor See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	9,702,172.00	9,702,172.00
3C2-4	Cable trench, steel cover included (Type"B")	Designed by Contractor See Dwg. No. TYP1A-C-3.1	Lump Sum	Lump Sum	907,305.00	907,305.00

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C2 : Cable Trench**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht		
					Unit Price	Amount	
3C2-5	Cable trench, RC cover included (Type"A")	Designed by Contractor See Dwg. No. TYP1A-C-3.1		Lump Sum	Lump Sum	9,310,043.00	9,310,043.00
3C2-6	Cable trench, RC cover included (Type"B")	Designed by Contractor See Dwg. No. TYP1A-C-3.1		Lump Sum	Lump Sum	261,324.00	261,324.00
<b>Total Price for Schedule 3C2</b>					<b>Baht</b>		<b>26,010,328.00</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency ( excluding VAT ) Baht		
					Unit Price	Amount	
3C3-1	500kV GIS Building	Designed by Contractor SD-GIS-9-02A 01/09-09/09 See Dwg. No. MM3-C-1 See Scope of work		Lump Sum	Lump Sum	201,886,728.00	201,886,728.00
3C3-2	500kV Control Building	Designed by Contractor SD-CD-0-01A 01/14-14/14 See Dwg. No. MM3-C-1 See Scope of work		Lump Sum	Lump Sum	45,628,312.50	45,628,312.50
3C3-2.1	Air conditioning system and Ventilation system						
3C3-2.1.1	Minimum 30,000 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		-	-



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C3 : Building**


**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C3-2.1.2	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	-	-
3C3-2.1.3	Minimum 40,000 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 )		1	set	-	-
3C3-2.1.4	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 )		2	set	-	-
3C3-2.1.5	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 )		20	set	-	-
3C3-2.1.6	Extra work for air conditioning system (additional cooling capacity included)		Lump Sum	Lump Sum	-	-

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C3 : Building**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C3-2.1.7	Ventilation system		Lump Sum	Lump Sum	-	-
<b>Total Price for Schedule 3C3</b>					<b>Baht 247,515,040.50</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C4 : Earth Work, Road and Crushed Rock Surfacing**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C4-1	Crushed rock surfacing 0.10 m thickness	See Dwg. No. MM3-C-1	Lump Sum	Lump Sum	7,853,472.00	7,853,472.00
3C4-2	Transformer loading	SD-RD-0-03 See Dwg. No. TYP1A-C-6	Lump Sum	Lump Sum	476,640.00	476,640.00
3C4-3	RC.Road type " E " section 4 - 4	SD-RD-0-01 See Dwg. No. TYP1A-C-6	Lump Sum	Lump Sum	7,507,350.00	7,507,350.00
3C4-4	RC.Road type " E " section 6 - 6	SD-RD-0-01 See Dwg. No. TYP1A-C-6	Lump Sum	Lump Sum	1,786,575.00	1,786,575.00
<b>Total Price for Schedule 3C4</b>					<b>Baht 17,624,037.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C5 : Water Supply System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C5-1	Water supply system	Designed by Contractor See Scope of work See Dwg. No. TYP1A-C-9	Lump Sum	Lump Sum	142,231.00	142,231.00
3C5-2	Automatic Pump with pressure tank	Designed by Contractor	1	set	18,489.00	18,489.00
3C5-3	Water storage tank capacity 2,000 liters, Polyethylene type	Designed by Contractor	1	set	18,489.00	18,489.00
3C5-4	50 cu.m Underground water tank (Pile type)	WD-UT-0-01 - 01/01	1	set	397,128.00	397,128.00
3C5-5	15 cu.m Water tank tower Pile type	WD-WT-0-02 - 01/03-03/03	1	set	457,646.00	457,646.00
3C5-6	Pump House	WD-WT-0-01 - 02/03	2	set	12,326.00	24,652.00
3C5-7	Water supply pump (Centrifugal pump)	WD-WT-0-01 - 02/03	2	set	47,454.00	94,908.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C5 : Water Supply System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C5-8	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01 - 01/01	Lump Sum	Lump Sum	69,560.64	69,560.64
<b>Total Price for Schedule 3C5</b>					<b>Baht 1,223,103.64</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C6 : Drainage System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C6-1	Oil separator (Including piles)	Designed by Contractor SD-OS-0-02 - 01/03 to 03/03 See Scope of work	1	set	1,336,202.00	1,336,202.00
3C6-2	Drainage System	Designed by Contractor See Dwg. No. TYP1A-C-6 See Scope of work	Lump Sum	Lump Sum	14,911,719.00	14,911,719.00
<b>Total Price for Schedule 3C6</b>					<b>Baht 16,247,921.00</b>	



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C7-1	64 sq.m Site office		1	set	850,000.00	850,000.00
3C7-2	Test and commissioning for fire pump system		Lump Sum	Lump Sum	60,000.00	60,000.00
3C7-3	Test and commissioning for inert gas system (Test in Electrical room)		Lump Sum	Lump Sum	78,000.00	78,000.00
3C7-4	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)		4	set	120,000.00	480,000.00
3C7-5	Fire Protection design work		Lump Sum	Lump Sum	534,472.62	534,472.62
3C7-6	Architectural and Civil engineering design work		Lump Sum	Lump Sum	10,909,573.10	10,909,573.10
3C7-7	Dynamic Pile load test		Lump Sum	Lump Sum	1,110,000.00	1,110,000.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C7 : Special Construction Works**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C7-8	Static pile load test		1	set	184,422.15	184,422.15
<b>Total Price for Schedule 3C7</b>					<b>Baht</b>	<b>14,206,467.87</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C8 : Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C8-1	Wire mesh fence and gate (Pile type )	SD-CF-0-01 01/02 to 02/02 See Dwg. No. MM3-C-1	Lump Sum	Lump Sum	2,073,680.00	2,073,680.00
3C8-2	Switchyard Entrance Gate (sliding gate)	SD-SG-0-03 01/01	1	set	434,844.00	434,844.00
3C8-3	Garage (5.50x17.50m)	HS-PS-0-02 01/01	1	set	431,393.00	431,393.00
3C8-4	Guard house	HS-GH-0-02 01/05 to 05/05	1	set	449,881.00	449,881.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C8 : Miscellaneous**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht		
					Unit Price	Amount	
3C8-5	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01 01/01		Lump Sum	Lump Sum	1,228,026.06	1,228,026.06
<b>Total Price for Schedule 3C8</b>						<b>Baht</b>	<b>4,617,824.06</b>



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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 500kV Control Building	Designed by Contractor	Lump Sum	Lump Sum	8,819,360.00	8,819,360.00
3C9-2	Fire Protection System for 500kV GIS Building	Designed by Contractor	Lump Sum	Lump Sum	3,953,620.00	3,953,620.00
3C9-3	Fire pump system	Designed by Contractor	Lump Sum	Lump Sum	4,400,000.00	4,400,000.00
3C9-4	Fire pump house	SD-FPH-8-01 01/09 to 09/09	1	set	1,479,060.00	1,479,060.00
3C9-5	Water storage tank min. capacity 250 cu.m	WD-UT-0-05 01/04 to 04/04	1	set	2,711,610.00	2,711,610.00
3C9-6	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04 01/01	1	set	252,673.00	252,673.00
3C9-7	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	3,855,005.00	3,855,005.00

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22 Apr 2022

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ทดตส-ท.

10 มิ.ย. 2565

**MEDIUM COST FOR BID NO. TIPN-S-05****3C9 : Fire Protection System****SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)****TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C9-8	Foam house	SD-FH-8-01 01/07 to 07/07	1	set	986,040.00	986,040.00
3C9-9	Bladder tank proportioning system and components	Designed by Contractor	1	set	999,900.00	999,900.00
3C9-10	Fire Protection System for transformer / shunt reactor	Designed by Contractor	4	set	780,686.50	3,122,746.00
3C9-11	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	1,573,000.00	1,573,000.00
3C9-12	PC. or RC. Pile sq. 0.18 * 0.18 m (Dowel bar, Pile cut off and Pile shoe are included)	SD-PL-0-01 - 01/01	Lump Sum	Lump Sum	63,402.00	63,402.00



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**MEDIUM COST FOR BID NO. TIPN-S-05**

**3C9 : Fire Protection System**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
3C9-13	PC. or RC. Pile sq. 0.26 * 0.26 m (Dowel bar, Pile cut off and Pile shoe included)	SD-PL-0-01 - 01/01	Lump Sum	Lump Sum	269,045.00	269,045.00
<b>Total Price for Schedule 3C9</b>					<b>Baht 32,485,461.00</b>	

  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3D7-1	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	45,021.00	45,021.00			XXXXX	XXXXX		
3D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	45,021.00	45,021.00			XXXXX	XXXXX		
3D7-3	Rupture disc of overpressure protection device spare parts for GIS (1 EA for each type/ each operating pressure)	1	set	THB	38,589.00	38,589.00			XXXXX	XXXXX		
3D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	Included	Included			XXXXX	XXXXX		
3D7-5	Maintenance closing device for circuit breaker	1	set	THB	405,182.00	405,182.00			XXXXX	XXXXX		
3D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	205,807.00	205,807.00			XXXXX	XXXXX		
3D7-7	Operating Analyzer Fitting Means accessories for GIS	1	set	THB	192,943.00	192,943.00			XXXXX	XXXXX		
3D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	360,162.00	360,162.00			XXXXX	XXXXX		

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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3D7 : Spare Parts for SF6 Gas Insulated Switchgear**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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				
3D7-9	Cost of Local Transportation for Item No. 3D7-1 thru 3D7-8	Lump sum	Lump sum		XXXXXX	XXXXXX	XXXXXX	XXXXXX	64,636.25	64,636.25		
<b>Total Price for Schedule 3D7</b>				<b>THB</b>	<b>1,292,725.00</b>		<b>Baht</b>		<b>Baht</b> <b>64,636.25</b>			


  
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**MEDIUM COST FOR BID NO. TIPN-S-05**  
**3D11 : Spare Parts for Power Fuse Fuse Link and Hook Stick**  
**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**  
**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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
3D11-1	Fuse link or refill unit25E for 22 kV power fuse (standard speed)	6		THB	12,764.40	76,586.40			XXXXX	XXXXX
3D11-2	Cost of Local Transportation for Item No. 3D11-1		Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,829.32	3,829.32
<b>Total Price for Schedule 3D11</b>				THB	<b>76,586.40</b>		Baht		<b>Baht 3,829.32</b>	

  
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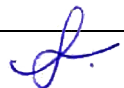
**MEDIUM COST FOR BID NO. TIPN-S-05**

**3D12 : Spare Parts for AC&DC Distribution Board and Termination Box**

**SUPPLY AND CONSTRUCTION OF 500 KV MAE MOH 3 SUBSTATION (GIS)**

**TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION 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
3D12-1	Fuse time lag type 1000 A	6				20,538.00	123,228.00	XXXXX	XXXXX	
3D12-2	Cost of Local Transportation for Item No. 3D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	6,161.40	
<b>Total Price for Schedule 3D12</b>						<b>Baht</b>	<b>123,228.00</b>	<b>Baht</b>	<b>6,161.40</b>	



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**Important Information**  
**for**  
**Invitation to Bid No. TIPN-S-05**

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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 and Article B-8. Information to be Submitted with Bid**

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

**Article A-4. Eligibility of Bidders: Technical Requirements**

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

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

**Article E-16. Inspection and Tests**

Terms and conditions regarding inspection and tests have been revised.

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

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

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

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

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

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

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

# DATA SHEET

for

## Invitation to Bid No. TIPN-S-05

(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.

1. Article A-3. Eligibility of Bidders: General Requirements

The following requirement shall be added to item I.:

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

2. Article B-3. Bid Security

The amount of bid security shall be USD 3,392,450.- or THB 111,250,000.-.

3. 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.

4. Article B-8. Information to be Submitted with Bid

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

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

5. 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 Lamphun 3 Substation (GIS) or Schedule 2 : 230 kV Lamphun 3 Substation (GIS) or Schedule 3 : 500 kV Mae Moh 3 Substation (GIS), 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 Lamphun 3 Substation (GIS) and Schedule 2 : 230 kV Lamphun 3 Substation (GIS) and Schedule 3 : 500 kV Mae Moh 3 Substation (GIS) for each Day of delay. This sum is payable regardless of the actual loss and/or damages incurred.

6. 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.

7. Defective Equipment to be replaced with the whole new set

Not Applicable

**Anti-Corruption Compliance Checklist**  
**(Consortium)**

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

Project : .....

State Agency: Electricity Generating Authority of Thailand

Member No. ... of the consortium:

.....

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

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

Signed

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

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

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

Project : .....

State Agency: Electricity Generating Authority of Thailand

Bidder Name : .....

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

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

Signed

\_\_\_\_\_

(Name of Bidder)

(Authorized person)

Stamp company seal (if any)

# **ELECTRICITY GENERATING AUTHORITY OF THAILAND**

Nonthaburi  
Thailand

## **INVITATION TO BID NO. TIPN-S-05**

### **SUPPLY AND CONSTRUCTION OF 500/230 kV LAMPHUN 3 (GIS) AND 500 kV MAE MOH 3 (GIS) SUBSTATIONS**

### **TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN UPPER NORTHERN REGION TO ENHANCE SYSTEM SECURITY**

**(TWO-ENVELOPE)**

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#### **Invitation**

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 500/230 kV Lamphun 3 (GIS) and 500 kV Mae Moh 3 (GIS) Substations under Transmission System Improvement Project in Upper Northern Region to Enhance System Security as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

#### **Work Description**

The supply and construction of 500/230 kV Lamphun 3 (GIS) and 500 kV Mae Moh 3 (GIS) 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.

#### **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 shall be a purchaser of the bidding documents from EGAT. For a joint venture or consortium, only one (1) member of the joint venture or consortium is required to purchase the bidding documents.***

***In the case where the Bidder is not the purchaser of the bidding documents, the purchaser shall notify EGAT of the name of the Bidder in writing prior to the bid opening.***

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.



## **Eligibility of Bidders: Technical Requirements**

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

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

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

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

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

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

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

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

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item I.c.6 Otherwise, it shall not be acceptable and shall be sufficient grounds for rejection.

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

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

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

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

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

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

6.1.1 Having one of the following qualifications:

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

OR

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

In case that supply record of Equipment of the type and ratings proposed fulfills the requirement, the manufacturer may propose a newly developed/modified type of such Equipment with successful operation/use of at least three (3) substations of which total GIS bays shall not be less than twelve (12) and for minimum one (1) year in overseas country (not his own country). The detailed information of the development/modification shall be submitted with his proposal. EGAT, however, reserves the right and will make its own judgment whether or not to consider/accept the proposed developed/modified type

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

- 6.1.2 Having a past design test record of the equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.
- 6.2 For 500 kV Control and Protection System, having the following qualifications:
  - 6.2.1 Being local manufacturer.
  - 6.2.2 Having one of the following qualifications:
    - 6.2.2.1 Having at least three (3) consecutive years' supply record of successful operation/use in 500 kV Transmission System of at least three (3) units of each type of Protective Relay Panels of which the characteristics are similar to the ones specified herein to EGAT.
    - OR
    - 6.2.2.2 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
    - 6.2.2.3 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

6.3 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:

- 6.3.1 Having one of the following qualifications:
  - 6.3.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.
  - OR
  - 6.3.1.2 For 230 kV Gas-Insulated Switchgear (GIS):  
Having a supply record of Equipment of the type proposed (type of enclosure, interrupter of circuit breaker, rated filling gas pressure) at the

nominal system voltage of 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 of 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.

- 6.3.2 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.
- 6.4 For 230 kV Control and Protection System and below, having the following qualifications:
  - 6.4.1 Being local manufacturer.
  - 6.4.2 Having one of the following qualifications:
    - 6.4.2.1 Having at least three (3) consecutive years' supply record of successful operation/use in 220 kV or above Transmission System of at least three (3) units of each type of Protective Relay Panels of which the characteristics are similar to the ones specified herein to EGAT or other Electricity Authorities of Thailand
  - OR
  - 6.4.2.2 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
  - 6.4.2.3 Being listed in EGAT ACCEPTED MANUFACTURER LIST FOR CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER) attached at the end of Section A. Invitation to Bid.

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

- a. The Bidder shall have sufficient capacity to carry out the work.
- b. The Bidder shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. In case the Bidder is a joint venture/consortium, either member of the joint venture/consortium shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT.
- c. The Bidder himself or his subcontractors, at the time of submitting this proposal, shall not carry excessive work nor be in a default position with respect to work with EGAT. Unsatisfactory past performance on Contract awarded by EGAT may be a sufficient reason of being disqualified.
- d. The Bidder shall propose Equipment from manufacturers who fulfill the requirements below. If there is any deficiency, EGAT reserves the right to require the Bidder to propose new manufacturer or new type/model of Equipment without any additional cost to EGAT.
  1. Regularly manufacturing of Equipment of the type and similar ratings proposed.
  2. Being well-established and maintaining a permanent place of business
  3. The manufacturer shall have the experience records that meet the requirements set forth herein.

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

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

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

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

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

- 5.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification (if required).
6. For Equipment not having the same ratings as specified in EGAT Accepted List at the end of Section A. Invitation to Bid:
    - 6.1 For 500 kV Ratings of following Equipment: Power Circuit Breaker, Instrument Transformer, Surge Arrester and Disconnecting Switch. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:
      - 6.1.1 Having one of the following qualifications:
        - 6.1.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.
      - OR
      - 6.1.1.2 Having a supply record of Equipment of the type proposed at the maximum system voltage of 420 kV or above, 3000 A or above, 50 kA or above, with successful operation/use of at least five (5) three phase sets and for minimum five (5) consecutive years in an overseas country (not his own country).

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

Supply records of the higher rating Equipment shall not be considered if the Bidder does not propose such higher rating Equipment in his bid.
    - 6.1.2 Having a past design test record of the Equipment as proposed, if specified in EGAT's specification. Such past design test record shall conform to the test specified in EGAT's specification.

6.2 For 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:

6.2.1 Having one of the following qualifications:

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

OR

6.2.1.2 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.

- 6.2.2 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.
- 6.3 For 230/115 kV Ratings of following Equipment: Instrument Transformer and Surge Arrester. These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:
  - 6.3.1 Having one of the following qualifications:
    - 6.3.1.1 Proposing the Equipment of the type and ratings which has already been accepted by EGAT.
    - OR
    - 6.3.1.2 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.

6.3.2 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.

6.4 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:

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

OR

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

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

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

6.5 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:

6.5.1 Being local manufacturer for the following Equipment:

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

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

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

6.5.3 Having one of the following qualifications:

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

OR

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

6.6 For Insulator:

Having one of the following qualifications:

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

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

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

OR

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

6.7 For Stationary Battery:

Having one of the following qualifications:

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

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

OR

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

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

Having one of the following qualifications:

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

OR

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

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

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

- 6.9 For 230 kV XLPE Power Cable:

Having one of the following qualifications:

- 6.9.1 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

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

- 6.10 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 main protective relays proposed shall be as specified in EGAT ACCEPTED MAIN RELAY LIST NO.1 and NO.2 attached at the end of Section A. Invitation to Bid.

- 6.11 For Fault Recording System:

- 6.11.1 Having one of the following qualifications:

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

OR

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

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

OR

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

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

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

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

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

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

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

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

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

OR

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

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

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

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

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

**Definitions:**

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

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**EGAT Accepted Bidders List for Supply and Construction of Substations**

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
1	Hitachi Energy (Thailand) Limited / Thailand	YES	YES	YES
2	Grid Solutions SAS / France	YES	YES	YES
3	Hitachi Ltd. / Japan	YES	YES	YES
4	Hyosung Heavy Industries Corporation / Korea	YES	YES	YES
5	KEC International Limited / India	YES	YES	YES
6	Mitsubishi Corporation / Japan	YES	YES	YES
7	Mitsubishi Electric Corporation / Japan	YES	YES	YES
8	Precise System and Project Co., Ltd. / Thailand	YES	YES	YES
9	SEPCOIII Electric Power Construction Corporation / China	YES	YES	YES
10	Siemens Energy Limited / Thailand	YES	YES	YES
11	Sri U-Thong Limited / Thailand	YES	YES	YES
12	TEDA Company Limited / Thailand	YES	YES	YES
13	Joint Venture of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Corporation / China)	YES	YES	YES
14	Consortium of Grid Solutions (Thailand) Ltd. and Grid Solutions SAS (Grid Solutions (Thailand) Ltd. / Thailand and Grid Solutions SAS / France)	YES	YES	YES
15	Consortium of Larsen & Toubro Limited and Sri U-Thong Limited (Larsen & Toubro Limited / India and Sri U-Thong Limited / Thailand)	YES	YES	YES
16	Consortium of Loxley Public Co., Ltd. and Sri U-Thong Limited (Loxley Public Co., Ltd. / Thailand and Sri U-Thong Limited / Thailand)	YES	YES	YES
17	Consortium of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Corporation / China)	YES	YES	YES
18	SBV Consortium (Sumitomo Corporation / Japan, Black & Veatch (Thailand) Limited / Thailand and Italian-Thai Development / Thailand)	YES	YES	YES
19	The Consortium of Mitsubishi Corporation and DEMCO Public Company Limited (Mitsubishi Corporation / Japan and DEMCO Public Company Limited / Thailand)	YES	YES	YES
20	The Consortium of Precise System and Project Co., Ltd. and Hitachi Ltd. (Precise System and Project Co., Ltd. / Thailand and Hitachi Ltd. / Japan)	YES	YES	YES
21	The Consortium of Mitsubishi Corporation and PWH (Thailand) Company Limited (Mitsubishi Corporation / Japan and PWH (Thailand) Company Limited / Thailand)	YES	YES	YES
22	Consortium of Larsen & Toubro Limited and Mitsubishi Corporation (Larsen & Toubro Limited / India and Mitsubishi Corporation / Japan)	YES	YES	YES
23	Sri U-Thong & LPS CONSORTIUM (Sri U-Thong Limited / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)	YES	YES	YES
24	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Sri U-Thong Limited. (DEMCO Public Company Limited / Thailand, KINDEN Corporation / Japan and Sri U-Thong Limited / Thailand)	YES	YES	YES
25	Hyundai Engineering & Construction Co., Ltd. / Korea		YES	YES
26	Larsen & Toubro Limited / India		YES	YES
27	Kalpataru Power Transmission Limited / India		YES	YES
28	PWH (THAILAND) CO., LTD. / Thailand		YES	YES
29	DEMCO Public Company Limited / Thailand		YES	YES
30	Italthai Engineering Co., Ltd. / Thailand		YES	YES

**เอกสารควบคุม**  
 รับรองสำเนาโดย ทพอ.ช.กฤษ-ส.อวส.  
 ก่อนนำไปใช้งาน  
 ต้องตรวจสอบ Revision คำสุด  
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.  
 25 Feb 2022





**EGAT Accepted Bidders List for Supply and Construction of Substations**

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
31	Sieyuan Electric Co., Ltd. / China		YES	YES
32	Black & Veatch (Thailand) Ltd. / Thailand		YES	YES
33	PESTECH Sdn. Bhd. / Malaysia		YES	YES
34	Shandong Taikai Power Engineering Co., Ltd. / China		YES	YES
35	SC-ST-BYP JOINT VENTURE COMPANY LIMITED / Thailand		YES	YES
36	China CAMC Engineering CO., LTD. / China		YES	YES
37	Kinden Corporation - Kinden (Thailand) Co., Ltd. Joint Venture (Kinden Corporation / Japan and Kinden (Thailand) Co., Ltd. / Thailand)		YES	YES
38	The Joint Venture of SRI and PWH (Sri U-Thong Limited / Thailand and PWH (Thailand) Company Limited / Thailand)		YES	YES
39	The Consortium of Kinden Corporation and Perfect Engineering Service Public Co., Ltd. (Kinden Corporation / Japan and Perfect Engineering Service Public Co., Ltd. / Thailand)		YES	YES
40	The Consortium of SCL-STC and ITE (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Company Limited / Thailand and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
41	The Consortium of Siemens Energy Limited and Sinkarnchang Company Limited (Siemens Energy Limited / Thailand and Sinkarnchang Company Limited / Thailand)		YES	YES
42	The Consortium of Siemens Energy Limited and Standard Performance Company Limited (Siemens Energy Limited / Thailand and Standard Performance Company Limited / Thailand)		YES	YES
43	JOINT VENTURE OF SCL, STC AND XD (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Co., Ltd. / Thailand and Xian Electric Engineering Co., Ltd. / China)		YES	YES
44	JOINT VENTURE OF SINOHYDRO CORPORATION LIMITED AND SINOHYDRO (THAILAND) CO., LTD. (Sinohydro Corporation Limited / China and Sinohydro (Thailand) Co., Ltd. / Thailand)		YES	YES
45	LOXLEY & LPS CONSORTIUM (LOXLEY PUBLIC COMPANY LIMITED / Thailand and LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand)		YES	YES
46	The consortium of DEMCO Public Company limited and KINDEN Corporation (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan)		YES	YES
47	The Consortium of Shanghai Electric Group Company Limited & Future Electrical Control Company Limited (Shanghai Electric Group Company Limited / China and Future Electrical Control Company Limited / Thailand)		YES	YES
48	Consortium of ITE - NCPE (Italthai Engineering Co., Ltd./ Thailand and North China Power Engineering Co., Ltd. of China Power Engineering Consulting Group / China)		YES	YES
49	The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Hyundai Electric & Energy Systems Company Limited (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan and Hyundai Electric & Energy Systems Company Limited / Korea)		YES	YES
50	Grid Solutions (Thailand) Limited / Thailand		YES	YES
51	CGGC-PG Joint Venture / China		YES	YES
52	Consortium of Pinggao Group Co., Ltd. and Italthai Engineering Co., Ltd. (Pinggao Group Co., Ltd. / China and Italthai Engineering Co., Ltd. / Thailand)		YES	YES
53	Hyundai Heavy Industries Co., Ltd. / Korea			YES

**เอกสารควบคุม**  
รับรองสำเนาโดย ทพอ.ศ.กฤษ.จิวส.  
ก่อนนำไปใช้งาน  
ห้องตรวจสอบ Revision สำนัก  
ฝ่ายวิศวกรรมระบบส่ง กฟผ.

25 Feb 2022

**EGAT Accepted Bidders List for Supply and Construction of Substations**

No.	Bidder / Country	Acceptance for		
		500 kV	230 kV	115&69 kV
54	LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand			YES
55	Future Electrical Control Company Limited / Thailand			YES
56	NARI Group Corporation / China			YES
57	Consortium ITE and HHI (Italthai Engineering Co., Ltd. / Thailand and Hyundai Heavy Industries Company Limited / Korea)			YES
58	The Consortium of Demco Public Co., Ltd. Perfect Engineering Service Public Co., Ltd. And Demco Power Co., Ltd. (Demco Public Company Limited / Thailand, Perfect Engineering Service Public Co., Ltd. / Thailand and Demco Power Co., Ltd. / Thailand)			YES
59	The Consortium of A2 Technologies Vietnam Co., Ltd. and A2 Technologies Co., Ltd. (Thailand) (A2 Technologies Vietnam Co., Ltd. / Vietnam and A2 Technologies Co., Ltd. (Thailand) / Thailand)			YES

**Note**

**Additionally, any bidders in the EGAT Accepted Bidders List for Supply and Construction of Substations of the same voltage level are allowed to form a new consortium or joint venture with other bidders in the accepted list. All parties of the new consortium or joint venture shall be accepted at the voltage level of the proposal.**



Bid No. TIPN-505

**เอกสารควบคุม**  
 รับรองสำเนาโดย ทพอ.ส.กส.ส. อวส.  
 ก่อนนำไปใช้งาน  
 ต้องตรวจสอบ Revision ล่าสุด  
 ฝ่ายวิศวกรรมระบบส่ง กฟผ.

25 Feb 2022

### EGAT Accepted Surge Arrester List

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

**เอกสารควบคุม**

รับรองสำเนาโดย พทอ-ส.กตส.ช.จวส.  
ก่อนนำไปใช้งาน  
ต้องตรวจสอบ Revision สำคัญ  
ฝ่ายวิศวกรรมระบบส่ง กฟผ.

12 Jul 2022



**EGAT Accepted Current Transformer List**

Description	Manufacturer / Country	Type / Model
230 kV CT, 3000A, 50kA	HITACHI ENERGY SWEDEN AB / Sweden	IMB 245
	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	CA-245
	NISSIN ELECTRIC CO., LTD. / Japan	FGCH-170
	ABB JIANGSU JINGKE INSTRUMENT TRANSFORMER CO., LTD. / China	LB7-245 (Creepage Distance 7812 mm)
115 kV CT, 2000A, 40kA	HITACHI ENERGY SWEDEN AB / Sweden	IMB 123
	EMEK ELEKTRIK ENDUSTRISI A.S. / Turkey	ATH-125
	ELECTROTECHNICAL ARTECHE HER MANOS, S.L. / Spain	CA-123
	NISSIN ELECTRIC CO., LTD. / Japan	FGCH-100
	ABB JIANGSU JINGKE INSTRUMENT TRANSFORMER CO., LTD. / China	LB7-145 (Creepage Distance 4495 mm)
	JIANGSU SIEYUAN HERTZ INSTRUMENT TRANSFORMER CO., LTD. / China	LVB-110



Bid No. TIPA/S-05

**EGAT Accepted Coupling Capacitor Voltage Transformer List**

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

Bid No. 505

EGAT Accepted Gas Insulated Switchgear List

Description	Manufacturer / Country	Type/Model	Equipment Rating			Type of Mechanism			Referenced GIS Component		
			kV	A	kA	Spring	Hydraulic	Hydraulic-Spring	CT	VT	Bushing (Porcelain)
									Manufacturer / Country	Manufacturer / Country	Manufacturer / Country
550 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-3	550	4000	63			✓	Pfiffner/Switzerland	Trench/Germany Ritz/Germany Pfiffner/Switzerland	LAPP/Germany XD/China
	Siemens AG / Germany	8DQ1P2	550	4000	50	✓			Trench/Germany	Trench/Germany	HSP/Germany
	GE Grid Solutions / France	T155	550	4000	50	✓			Pfiffner/Switzerland ENPAY/Turkey	GE/France Ritz/Germany	PPC/Austria Ceralap/France
	Hitachi Ltd. / Japan	IFT	550	6300	63		✓		Hitachi/Japan Meiden Chemical/Japan	Nissin/Japan Toko/Japan	N.G.K./Japan
	Hyundai Heavy Industries Co., Ltd. / Korea	550SR	550	4000	63		✓		Daeyoung/Korea Hyundai/Korea	Nissin/Japan TOKO/Japan Trench/Germany	PPC/Germany PPC/Sweden TYCO/Switzerland N.G.K./Japan
	Mitsubishi Electric Corporation / Japan	500-GPS	550	4000	50	✓			Melco/Japan	Melco/Japan	N.G.K./Japan
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZF15-550	550	4000	63		✓		Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
245 kV, 4000 A, 50 kA GIS	Hitachi Energy Switzerland Ltd. / Switzerland	ELK-14	245	4000	63 50			✓	Pfiffner/Switzerland ABB/Czech	Pfiffner/Switzerland Trench/Germany	LAPP/Germany XD/China
	GE Grid Solutions / France	B105	245	4000	50	✓			ENPAY/Turkey ALCE/Turkey GE/France	GE/France	PPC Insulators/Austria Ceralap/France GE/France
	Hyosung Corporation / Korea	HSG-305B	300	4000	50	✓			Hyosung/Korea	Nissin/Japan Toko/Japan	LAPP/Germany
	Xian XD Switchgear Electric Co., Ltd./ China	ZF9-252	245	4000	50	✓			XD/China Nanjing Zhida Electric/China	XD/China	XD/China
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-252	245	4000	50	✓			Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	GE High Voltage Switchgear (Suzhou) Co., Ltd / China	B105	245	4000	50	✓			Nanjing Zhida / China	Suzhou TOKO / China	Liling Huaxin Insulator Technology Cp.,Ltd./China
123 kV, 3150/2000 A, 40 kA GIS Main bus 3150 A Feeder 2000 A	ABB High Voltage Switchgear (Xiamen) Co., Ltd. / China	ELK-04	145	3150	40			✓	Pfiffner/Switzerland Sihui/China ABB Jingke / China	Pfiffner/Switzerland Siyuan/China ABB Jingke / China Pfiffner / Germany	XD/China
	Hyundai Heavy Industries Co., Ltd. / Korea	145SP-1	123	3150	40	✓			Dongwoo/Korea	Nissin/Japan	LAPP/Germany
	Hyosung Corporation / Korea	HSG-144D	145	3150	40	✓			Hyosung / Korea	Nissin/Japan	LAPP/Germany
	New Northeast Electric Group High Voltage Switchgear Co., Ltd./ China	ZFW20-145	145	3150	40	✓			Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liaoning Xinming Instrument Transformer Co.,Ltd./China	Liling Huaxin Insulator Technology Cp.,Ltd./China
	ILJIN Electric Co., Ltd. / Korea	IJS 1440	145	3150	40	✓			Samnung / Korea	Toko Takaoka Korea / Korea	Lapp / Romania
	TOSHIBA Energy Systems & Solutions Corporation/ Japan	G3A-b	145	3150	40	✓			TOSHIBA / Japan	TOSHIBA / Japan	TOSHIBA / Japan
	Shanghai Siyuan High Voltage Switchgear Co., Ltd. / China	ZF28A-145	145	3150	40	✓			Shanghai Siyuan High Voltage Switchgear Co., Ltd. / China	Jiangsu Siyuan Hertz Co.,Ltd. / China	XD/China

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**EGAT Accepted Power Circuit Breaker List**

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

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**EGAT Accepted Disconnecting Switch List**

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

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**EGAT Accepted Disconnecting Switch List**

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

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EGAT ACCEPTED MAIN RELAY LIST No.1

Description	Manufacturer	Accepted Type	Accepted Voltage Level			Notes
			500 kV	230 kV	115&69 kV	
Current Differential Protection	ABB	RED670 (*)	✓	✓	✓	
	GE	P543	✓	✓	✓	
		L90	✓	✓	✓	
	SEL	SEL-311L	✓	✓	✓	
		SEL-411L (*)	✓	✓	✓	
	Siemens	7SD52 (**)	✓	✓	✓	
	Schneider Electric	P543 (*)	✓	✓	✓	
	Ingeteam	EF-LD (*)	✓	✓	✓	
NR Electric	PCS-931 (*)	✓	✓	✓		
Distance Protection	ABB	REL670 (*)	✓	✓	✓	
	GE	P443	✓	✓	✓	
		D30			✓	Only for three-pole tripping and line protection without carrier scheme.
		D60		✓	✓	
		ALPSDA1	✓	✓	✓	
	SEL	SEL-311C			✓	Only for three-pole tripping and line protection without carrier scheme.
		SEL-421 (*)	✓	✓	✓	
		SEL-411L (*)	✓	✓	✓	
	Siemens	7SA522 (**)	✓	✓	✓	
		7SA6 series (**)	✓	✓	✓	
7SA87 (*)		✓	✓	✓		

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EGAT ACCEPTED MAIN RELAY LIST No.1

Description	Manufacturer	Accepted Type	Accepted Voltage Level			Notes
			500 kV	230 kV	115&69 kV	
Distance Protection	Schneider Electric	P443 (*)	✓	✓	✓	
	Ingeteam	EF-ZT (*)	✓	✓	✓	
	NR Electric	PCS-902 (*)	✓	✓	✓	
	Toshiba	GRZ200 (*)		✓	✓	
	ZIV	ZLV		✓	✓	
Transformer Differential Protection	ABB	RET670 (*)	✓	✓	✓	
		RET650 (**)	✓	✓	✓	3-restraints
	GE	P64x	✓	✓	✓	
		T35		✓	✓	
		T60		✓	✓	
	SEL	SEL-387		✓	✓	4-restraints
		SEL-487E (*)	✓	✓	✓	
		SEL-587			✓	2-restraints
		SEL-787 (**)			✓	4-restraints
	Siemens	Duobias (**)		✓	✓	
		7UT6 (**)	✓	✓	✓	5-restraints
		7UT82 (*)	✓	✓	✓	2-restraints
		7UT86 (*)	✓	✓	✓	3-restraints
	Schneider Electric	P645 (*)	✓	✓	✓	
	Ingeteam	EF-TD (*)	✓	✓	✓	3-restraints
	NR Electric	PCS-978 (*)	✓	✓	✓	
	Toshiba	GRT200 (*)	✓	✓	✓	
	ZIV	IDV	✓	✓	✓	
	Mitsubishi	MRD-HA (**)			✓	3-restraints

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EGAT ACCEPTED MAIN RELAY LIST No.1

Description	Manufacturer	Accepted Type	Accepted Voltage Level			Notes
			500 kV	230 kV	115&69 kV	
High Impedance	ABB	REB650 (**)	✓	✓	✓	
Busbar Protection	SEL	SEL-587Z	✓	✓	✓	
Low Impedance Busbar Protection	ABB	REB670 (*)	✓	✓	✓	
		REB500	✓	✓	✓	
	GE	P746	✓	✓	✓	
		P740	✓	✓	✓	
		P747	✓	✓	✓	
		B90	✓	✓	✓	
		B30	✓	✓	✓	Only for breaker and a half, double bus double breaker or main and transfer bus arrangement.
	SEL	SEL-487B (*)	✓	✓	✓	
	Siemens	7SS52 (**)	✓	✓	✓	
		7SS60	✓	✓	✓	Only for breaker and a half, double bus double breaker or main and transfer bus arrangement.
		7SS85 (*)	✓	✓	✓	
	Schneider Electric	P746 (*)	✓	✓	✓	
		P740 (**)	✓	✓	✓	
	Toshiba	GRB200 (*)	✓	✓	✓	
	Mitsubishi	MBP-H1A (**)		✓	✓	In case of double bus single breaker arrangement, maximum 8 feeders with 1 bus coupler and 2 bus sections are allowed.

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EGAT ACCEPTED MAIN RELAY LIST No.1

Description	Manufacturer	Accepted Type	Accepted Voltage Level			Notes
			500 kV	230 kV	115&69 kV	
Breaker Failure Protection	ABB	REQ650 (**)			✓	
	GE	P141			✓	Only for 3-phase breaker failure function.
		P14Nx	✓	✓	✓	
		C60		✓	✓	
		F60		✓	✓	
	SEL	SEL-501			✓	Only for 3-phase breaker failure function.
	Siemens	7VK6 series (**)	✓	✓	✓	
		7SJ82 (*)			✓	Only for 3-phase breaker failure function.
	Schneider Electric	P821		✓	✓	Only firmware version 1.F is accepted.
	Ingeteam	EF-ZT (*)	✓	✓	✓	
	NR Electric	PCS-9611 (*)			✓	Only for 3-phase breaker failure function.
	Toshiba	GRD200 (*)	✓	✓	✓	
ZIV	IRL			✓	Only for 3-phase breaker failure function.	

Remarks

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

Notes

1. The procedures for being listed in EGAT ACCEPTED MAIN RELAY LIST are specified in the EGAT's Pre-Qualification (PQ) process, of which the details can be provided by Transmission System Engineering Division on request.
2. If any types of relay in the list are planned to discontinue the manufacturing, the manufacturer or the representative is responsible for informing EGAT at least 1 year before the unavailable date.
3. The relays shall be configured to comply with all EGAT's required functions.

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EGAT ACCEPTED MAIN RELAY LIST No.2

Description	Manufacturer	Accepted Type	Accepted Voltage Level				Notes
			500 kV	230 kV	115&69 kV	33&22 kV	
Directional Overcurrent Relay	ABB	REQ650 (**)	✓	✓	✓	✓	
	GE	P14Dx	✓	✓	✓	✓	
		P841	✓	✓	✓	✓	
		P143	✓	✓	✓	✓	
	SEL	SEL-351A	✓	✓	✓	✓	
		SEL-451 (*)	✓	✓	✓	✓	
		SEL-751 (**)	✓	✓	✓	✓	
	Siemens	7SJ62 (**)	✓	✓	✓	✓	
		7SJ85 (*)	✓	✓	✓	✓	
		7SJ82 (*)	✓	✓	✓	✓	
	Schneider Electric	P141 (**)	✓	✓	✓	✓	
		P143 (**)	✓	✓	✓	✓	
	Ingeteam	EF-MD (*)	✓	✓	✓	✓	
		DA-PT (**)	✓	✓	✓	✓	
	NR Electric	PCS-9611 (*)				✓	None of line fault locator. Only use with feeder.
	Toshiba	GRE140	✓	✓	✓	✓	
GRD200 (*)		✓	✓	✓	✓		
ZIV	IRV		✓	✓	✓		
Overcurrent Relay	ABB	REQ650 (**)	✓	✓	✓	✓	
	GE	P141	✓	✓	✓	✓	
		P14Dx	✓	✓	✓	✓	
		P14Nx	✓	✓	✓	✓	
		P841	✓	✓	✓	✓	
		F60	✓	✓	✓	✓	

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EGAT ACCEPTED MAIN RELAY LIST No.2

Description	Manufacturer	Accepted Type	Accepted Voltage Level				Notes	
			500 kV	230 kV	115&69 kV	33&22 kV		
Overcurrent Relay	GE	F650	✓	✓	✓	✓		
		SR350	✓	✓	✓	✓		
		P143	✓	✓	✓	✓		
	SEL	SEL-351A	✓	✓	✓	✓		
		SEL-451 (*)	✓	✓	✓	✓		
		SEL-551	✓	✓	✓	✓		
		SEL-751 (**)	✓	✓	✓	✓		
		SEL-751A	✓	✓	✓	✓		
	Siemens	7SJ61 (**)	✓	✓	✓	✓		
		7SJ62 (**)	✓	✓	✓	✓		
		7SJ85 (*)	✓	✓	✓	✓		
		7SJ82 (*)	✓	✓	✓	✓		
	Schneider Electric	P120	✓	✓	✓	✓		
		P122	✓	✓	✓	✓		
		P141 (**)	✓	✓	✓	✓		
		P143 (**)	✓	✓	✓	✓		
	Ingeteam	EF-MD (*)	✓	✓	✓	✓		
		DA-PT (**)	✓	✓	✓	✓		
	NR Electric	PCS-9611 (*)			✓	✓		Only for three-pole tripping.
	Toshiba	GRE140	✓	✓	✓	✓		<div style="border: 2px solid red; padding: 5px; text-align: center;"> <p><b>เอกสารควบคุม</b></p> <p>รับรองสำเนาโดย ทพอ-ส.กสส-ส.อวส.</p> <p>ก่อนนำไปใช้งาน</p> <p>ต้องตรวจสอบ Revision ล่าสุด</p> <p>ฝ่ายวิศวกรรมระบบส่ง กฟผ.</p> </div>
GRD200 (*)		✓	✓	✓	✓			
ZIV	IRV		✓	✓	✓			
	IRL	✓	✓	✓	✓			

EGAT ACCEPTED MAIN RELAY LIST No.2

Description	Manufacturer	Accepted Type	Accepted Voltage Level				Notes
			500 kV	230 kV	115&69 kV	33&22 kV	
Synchronism Check Relay	ABB	REQ650 (**)	✓	✓	✓		Only product version 2.1 is accepted.
	GE	P841	✓	✓	✓		
		F60	✓	✓	✓		
		F650	✓	✓	✓		
	SEL	SEL-351A	✓	✓	✓		
		SEL-451 (*)	✓	✓	✓		
		SEL-751 (**)	✓	✓	✓		
		SEL-751A	✓	✓	✓		
	Siemens	7VK61 (**)	✓	✓	✓		
		7SJ85 (*)	✓	✓	✓		
		7SJ82 (*)	✓	✓	✓		
	Ingeteam	EF-MD (*)	✓	✓	✓		
		DA-PT (**)	✓	✓	✓		
	NR Electric	PCS-9611 (*)	✓	✓	✓		
Toshiba	GRD200 (*)	✓	✓	✓			
Auto Reclosing Relay	ABB	REQ650 (**)	✓	✓	✓		
	GE	P841	✓	✓	✓		
		F60			✓		Only for three-pole reclose
		F650			✓		Only for three-pole reclose
		DRS			✓		Only for three-pole reclose

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EGAT ACCEPTED MAIN RELAY LIST No.2

Description	Manufacturer	Accepted Type	Accepted Voltage Level				Notes
			500 kV	230 kV	115&69 kV	33&22 kV	
Auto Reclosing Relay	SEL	SEL-351A			✓		Only for three-pole reclose
		SEL-451 (*)			✓		Only for three-pole reclose
		SEL-751 (**)			✓		Only for three-pole reclose
	Siemens	7VK61 (**)	✓	✓	✓		
		7SJ82 (*)			✓		Only for three-pole reclose
	Ingeteam	EF-ZT (*)	✓	✓	✓		
	NR Electric	PCS-9611 (*)			✓		Only for three-pole reclose
Toshiba	GRD200 (*)	✓	✓	✓			
Overfluxing Relay	Ingeteam	EF-TD (*)	✓	✓	✓		
Frequency Relay	GE	P94Vx	✓	✓	✓	✓	
		MIV		✓	✓	✓	
	SEL	SEL-351A	✓	✓	✓	✓	
		SEL-451 (*)	✓	✓	✓	✓	
		SEL-751 (**)	✓	✓	✓	✓	
		SEL-751A	✓	✓	✓	✓	
	Siemens	7SJ85 (*)	✓	✓	✓	✓	
		7SJ82 (*)	✓	✓	✓	✓	
	Ingeteam	EF-MD (*)	✓	✓	✓	✓	
		DA-PT (**)	✓	✓	✓	✓	
	NR Electric	PCS-9611 (*)	✓	✓	✓	✓	
	ZIV	IRL	✓	✓	✓	✓	
Under/Overvoltage Relay	GE	MIV		✓	✓	✓	
		P94V	✓	✓	✓	✓	None of VT input (open delta connection) for 59N.

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EGAT ACCEPTED MAIN RELAY LIST No.2

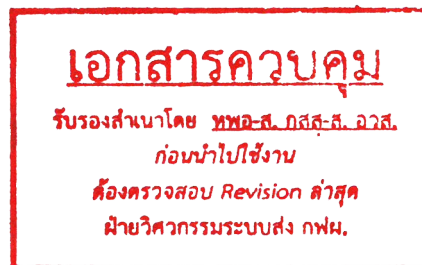
Description	Manufacturer	Accepted Type	Accepted Voltage Level				Notes
			500 kV	230 kV	115&69 kV	33&22 kV	
Under/Overvoltage Relay	SEL	SEL-351A	✓	✓	✓	✓	
		SEL-751 (**)	✓	✓	✓	✓	
		SEL-751A	✓	✓	✓	✓	
	Siemens	7SJ62 (**)	✓	✓	✓	✓	
		7SJ85 (*)	✓	✓	✓	✓	
		7SJ82 (*)	✓	✓	✓	✓	
	Schneider Electric	P141 (**)	✓	✓	✓	✓	
		P143 (**)	✓	✓	✓	✓	
	Ingeteam	EF-MD (*)	✓	✓	✓	✓	
		DA-PT (**)	✓	✓	✓	✓	
	NR Electric	PCS-9611 (*)		✓	✓	✓	Only for C-bank protection.
	Toshiba	GRD200 (*)	✓	✓	✓	✓	
ZIV	IRV	✓	✓	✓	✓		

Remarks

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

Notes

- The procedures for being listed in EGAT ACCEPTED MAIN RELAY LIST are specified in the EGAT's Pre-Qualification (PQ) process, of which the details can be provided by Transmission System Engineering Division on request.
- If any types of relay in the list are planned to discontinue the manufacturing, the manufacturer or the representative is responsible for informing EGAT at least 1 year before the unavailable date.
- The relays shall be configured to comply with all EGAT's required functions.



EGAT ACCEPTED FAULT RECORDING SYSTEM LIST

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

Remarks

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

Notes

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

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01 Apr 2022



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



**เอกสารควบคุม**

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01 Apr 2022

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. TIPN-S-05

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ท้ายวิศวกรรมระบบส่ง กฟผ.

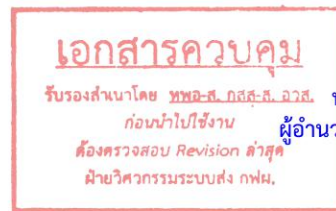
25 Feb 2022

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 Energy 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 Energy 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.



นางสุดารัตน์ ไชยพันธุ์  
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง  
22 Dec 2021

25 Feb 2022

**SECTION H**  
**SCOPE OF WORK**

## SCOPE OF WORK

### H-1. General

<u>No.</u>	<u>Substation</u>	<u>Page</u>
1.	500/230 KV LAMPHUN 3 SUBSTATION (GIS)	
	- GENERAL	H1-1
	- ELECTRICAL PART	H1A-1
	- CONTROL AND PROTECTION PART	H1B-1
	- COMMUNICATION PART	H1C-1
	- CIVIL AND ARCHITECTURAL PART	H1D-1
2.	500 KV MAE MOH 3 SUBSTATION (GIS)	
	- GENERAL	H2-1
	- ELECTRICAL PART	H2A-1
	- CONTROL AND PROTECTION PART	H2B-1
	- COMMUNICATION PART	H2C-1
	- CIVIL AND ARCHITECTURAL PART	H2D-1



## **1. 500/230 KV LAMPHUN 3 SUBSTATION (GIS)**

### **GENERAL**

The new 500 kV GIS Substation is located at Tumbon Si Bua Ban, Amphoe Mueang, Lamphun Province. The new 500 kV Gas Insulated switchgear (GIS) is Breaker & A Half scheme. The existing 230 kV Gas Insulated switchgear (GIS) is Breaker & A Half scheme.

The scope of work comprises two (2) schedules as follows:

### **Schedule 1: 500 kV Lamphun 3 Substation (GIS)**

The new 500 kV GIS shall be Breaker & A Half scheme that have one (1) diameter with three (3) bays and two (2) diameters with two (2) bays to be provided for transmission line and auto-transformer as follows:

- Two (2) feeders for 500 kV Line No. 1 & 2 to Mae Moh 3
- Two (2) feeders for 3-1x333.33 MVA, 500/230-22 kV auto-transformers “KT3A & KT4A”

### **Schedule 2: 230 kV Lamphun 3 Substation (GIS)**

Two (2) Feeders of Breaker & A Half scheme at the existing 230 kV GIS shall be connected to the 3-1x333.33 MVA, 500/230-22 kV auto-transformers “KT3A & KT4A”

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

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

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

- 4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

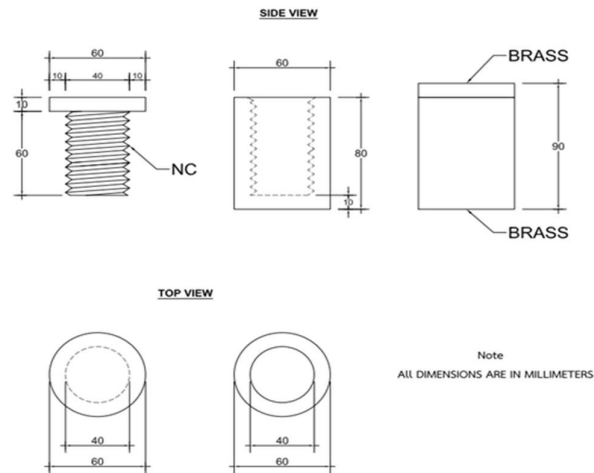
## **ELECTRICAL PART**

### **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 & 230 kV Gas Insulated switchgear (GIS)**

- 1.1 Design, supply and installation of equipment required for a complete the new 500 kV GIS & 22 kV system.
- 1.2 Design, supply and installation of equipment required for a complete the existing 230 kV GIS.
- 1.3 Design, supply and installation of miscellaneous hardware required for as following:
  - 1.3.1 The connection between the new 500 kV substation & the existing 230 kV substation
  - 1.3.2 The connection of 500 kV GIS air bushings and 230 kV GIS air bushings to 3x1-333.33 MVA, 500/230-22 kV auto-transformers (KT3A & KT4A).
  - 1.3.3 The connection of 500 kV overhead line to the 55 MVar, 525 kV shunt reactor (SR1A & SR2A).
  - 1.3.4 The connection of the new 500 kV GIS air bushings to 500 kV overhead lines.
  - 1.3.5 The grounding equipment and miscellaneous hardware for 3x1-333.33 MVA, 500/230-22 kV auto-transformers (KT3A & KT4A).
  - 1.3.6 The grounding equipment and miscellaneous hardware for 55 MVar, 525 kV shunt reactor (SR1A & SR2A).
- 1.4 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.
- 1.5 Supply and installation of the marking pins for the referenced positions from the main bus shall be provided in the GIS building. The positions of the marking pins shall be shown on the drawings for future GIS extension and the quantity shall be not less than 3 sets. The making pins shall be made of brass or stainless steel that have the formation as follows:

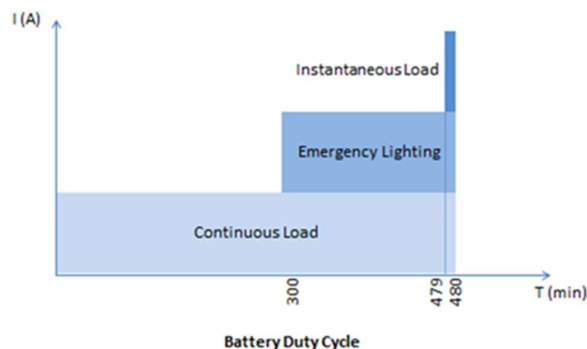


- 1.6 The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.
- 1.7 The detachable walk way (Cat walk) for visual inspection shall be properly installed on each GIS module and removable Service Platform, Removable Ladder shall be provided for GIS inspection.
- 1.8 The feeder nameplates as well as phasing, device, and switching numbers shown on the GIS module shall be painted or mounted (detachable type) on the enclosure of GIS whichever is appropriate according to the instruction from EGAT GIS installation team.
- 1.9 Design, supply and installation of the equipment required for connecting the 22 kV tertiary of the 3x1-333.33 MVA, 500/230-22 kV auto-transformer to be delta form.
- 1.10 The sag and tension of phase wires and overhead ground wires shall be calculated and designed according to internationally-accepted standards by the Contractor and the said calculation shall be submitted to EGAT for approval.
- 1.11 Design, supply and installation of 22 kV XLPE cable system which comprises at least the following:
  - 1.11.1 The design and calculation of the 22 kV cable system shall conform to IEC or IEEE standards.
  - 1.11.2 The 22 kV XLPE cable shall be single-core with copper conductor.
  - 1.11.3 The minimum bending radius of the 22 kV XLPE cable shall be checked by Contractor for cable installation.
  - 1.11.4 The Contractor shall design the 22 kV cable system such that one (1) 1/C-35 Sq.mm XLPE cable shall be able to carry the continuous current not less than 50 A given that the ambient temperature is not less than 45 C° and the effect of solar heat shall be considered. The other parameters used in the design shall be practical, reasonable, operational and conform to IEC or IEEE standards. The calculated continuous current rating shall be shown in the single line diagram. The calculation shall be submitted to EGAT for approval.

- 1.11.5 The Contractor shall design and select the type of metallic screen bonding. The induced voltage measured in every point of the metallic screen of 22 kV XLPE cables shall be less than 60 V or shall conform to the IEC or IEEE standards' calculation.
- 1.11.6 Design, supply and installation the equipment to protect the power cable from the surge voltage.
- 1.11.7 The abnormal condition which occurs from the design and installation of 22 kV XLPE cables for example ferroresonance etc. shall be responsible by the Contractor.

**2. Station service system**

- 2.1 Design, supply and installation of equipment required for a complete 400/230 V power supply system.
- 2.2 Design, supply and installation of emergency lighting system for the GIS building and relay building in case of normal station service fails with the illuminance of 150 LUX for at least 3 hours as shown in figure below.
- 2.3 Design, supply and installation of the stationary battery, in which the battery is capable for delivering power to the control and protection for tripping all circuit breakers and emergency essential load at least 8 hours and emergency lighting at least 3 hours as shown in the figure below if normal station service fails. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards. In addition, the size of the stationary battery shall be designed to support the operation of the new 500 kV GIS and future diameter as shown on the attached Bidding Document Drawings. The calculation shall be submitted to EGAT for approval. The size of battery shall not be less than as follows:
  - a) 1200 Ah for 500 kV Substation.



- 2.4 One (1) set of the stationary battery shall be installed at the relay building and another one shall be installed at the existing control building.

### 3. Grounding system

- 3.1 Design, supply and installation the grounding system of the new 500 kV Substation grounding system including the grounding system of 500 kV GIS building, relay building and 22 kV system.
- 3.2 The grounding conductor of the substation grounding system shall be of 4/0 AWG bare copper wire type.
- 3.3 The ground grid conductors spacing under the building area shall be the same as the Switchyard.
- 3.4 Design, supply and installation of the grounding equipment and miscellaneous hardware for 500/230 kV system.
- 3.5 The contractor shall evaluate the price of ground grid based on the specified design for price reference as below:
  - 3.5.1 The maximum ground grid conductor spacing ( $D_0$ ) shall be 5 meters.
  - 3.5.2 The number of ground rod shall be 100 pieces.
- 3.6 The Contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.
- 3.7 The Contractor shall design a grounding grid based on the measured soil resistivity by hand calculation using the equations in IEEE-80 standard and submitted to EGAT for Approval. The parameters for grounding system calculation shall be used as follows;
  - Fault current division factor ( $S_f$ ) value = 1
  - Fault current (rms) = 50 kA
  - Time duration of fault = 1 second

These parameters shall be used for determine the size of grounding conductor for the substation grounding system. If the ground conductor spacing calculated by hand ( $D_1$ ) is less than the grounding conductor spacing for reference ( $D_0$ ), the Contractor shall design a grounding grid by using the software. The certification of software shall be acceptable for commercial use.
- 3.8 The contractor shall connect the grounding grid between the new 500 kV GIS area and the existing area at every 5 meters.
- 3.9 Modification and connection of the new ground grid to the existing ground grid for the 230 kV substation. Moreover, the existing ground grid of 230 kV substation also shall be modified (If required).
- 3.10 The measurement of ground resistance at 500/230 kV substation shall be performed by the Contractor after completion of grounding system installation. Before the measurement, the overhead ground wire shall be disconnected from substation. The method of measurement shall follow the IEEE Std 81-2012, "IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System" or the latest versions. Then the result shall be submitted to EGAT.

#### **4. Lightning protection system**

4.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) is to be used in calculation instead of Critical Flashover voltage (CFO) as follows:

- a) 1550 kV for 500 kV Substation.
- b) 900 kV for 230 kV Substation.

For 22 kV Substation, the stroke current of 2 kA shall be used for the calculation.

4.2 For the design of lightning protection system for the 500 kV GIS building and relay building, the lightning protection level (LPL) shall be used level 1 for calculation and the overhead ground wire is not permitted. Air terminal rods installed at the roof shall be used instead.

4.3 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

#### **5. Facility system**

##### **5.1 Outdoor facility system**

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

5.1.2 The lamps for outdoor facility lighting system shall be LED type with all integral accessories, e. g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation.

##### **5.2 Indoor facility system**

5.2.1 Design, supply and installation of the facility system which mainly consists of lighting system, grounding system, power supply, fire alarm and protection system, and ventilation system, air-conditioning system, and telephone & LAN system in the 500 kV GIS building and relay building. All cable wiring systems shall conform to NEC and IEC standards or internationally-accepted standards.

5.2.2 The lamps for indoor facility lighting system shall be LED type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the LED lamp circuit shall be supplied by 2 - 3 manufacturers. The power factor of the LED lamps shall be more than 0.9.

- 5.2.3 All steel accessories e. g. lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.
- 5.3 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated load current.
- 5.4 The voltage drop from the safety switch to the AC boards and from the AC boards to the load shall not exceed 3% and 2% respectively.

## **6. Other works**

- 6.1 Supply and installation of miscellaneous hardware required for suspension and station post insulators assembly.
- 6.2 Modification of Junction box supporting structure (JB003) for the installation of outdoor receptacle box (ORB3).
- 6.3 Removal of the existing fence lighting with steel structures. Details of removal are shown on the bidding document drawings. All removed equipment shall be carefully packed by the Contractor and delivered to EGAT at Lamphun 3 Substation.

## **7. Testing and commissioning**

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

## **Work not included in this Contract**

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

- 1. Supply and installation of 500/230-22 kV auto-transformers “KT3A & KT4A”, except cabling from the common control cubicle for auto-transformers (CCC) to the associated equipment.
- 2. Supply and installation of the 525 kV Shunt Reactors and their Neutral Reactors, except cabling from the control cubicle of the Shunt Reactors to the associated equipment.
- 3. The stringing work for the connection between the 500 kV substation take-off structures and the dead-end towers of the transmission lines.
- 4. Supply station post and suspension insulators.



# **CONTROL AND PROTECTION PART**

## **Work included in this Contract**

### **1. For 500 kV Lamphun 3 Substation (New Relay Room No.1)**

- 1.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Swing rack type protective relay switchboards.
  - Transducer panel.
  - Interposing relay panel.
  - Marshalling panels for the remote terminal unit (Supplied by EGAT).
  - Marshalling panels for the fault recording system (Supplied by EGAT).
  - Marshalling panels for the control system (Supplied by EGAT).
  - Marshalling panel for the teleprotection.
  - Fault Recording System.
  - Outdoor antenna and GPS receiver Panel.
  - 400/230 VAC, 125 VDC power panel and 125 VDC Power distribution boards.
  - Cables and accessories as well as connection of cables among all of the boards and the associated equipment in order to complete the function of the control and protection system.
- 1.2 Design of the schematic, installation, wiring, test and commissioning of EGAT Remote Terminal Units (RTUs) which are supplied by EGAT. The configuration of database which is included in this Contract shall be fulfilled by the Contractor under EGAT's supervision.
- 1.3 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 1.4 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

### **2. For 500/230 kV Lamphun 3 Substation (230/115 kV Control Room)**

- 2.1 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 switchboard.
  - Synchronizing panel.
  - Loose equipment as specified in the price schedules.
  - 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.

- 2.2 Design, modification, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
- Modify 50BF-881 circuit to 50BF-882 circuit and related panel.
  - Modify 50BF-892 circuit to 50BF-893 circuit and related panel.
  - Modify control circuit of breakers (diameter no.8,9).
  - Modify CT input of protection at line no.1 to Lamphun 2 and line no.2 to Chiang Mai 2
  - Modify Line protection of other line that share same diameter (diameter no.8,9).
  - Add V-TDR in TDR Panel.
  - Interface the new equipment to GPS & Ethernet Switch systems.
  - 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.
- 2.3 Design, modification of the schematic drawing, installation and configuration of the application software, database, control function and display for the 500 kV EGAT Computerized Control System (CCS) whereas the application software is supplied by EGAT. The installation shall be under EGAT's supervision.
- 2.4 Design, modification, wiring, configuration, calibration, test and commissioning of the existing fault recording systems. The modified input is about 20 digital inputs. The existing FRS is "IDM+" model of Qualitrol.
- 2.5 Design, modification of the schematic drawing, configuration of database and wiring diagrams of the additional inputs for the existing 230kV EGAT CCS/RTU. The test and commissioning of the completed EGAT CCS/RTU shall be performed by the Contractor. The configuration shall be under EGAT's supervision.
- 2.6 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 2.7 The existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.
- 2.8 Removal of the unused existing cables, equipment and panels. The removed cables which shall be neatly reeled and the removed panels shall be kept in a suitable place recommended by EGAT.
- 2.9 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

### **Work not included in this Contract**

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

## **COMMUNICATION PART**

### **Schedule 1**

#### **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**

### **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:

#### **Architectural work**

#### **1. Design and Construction of**

- 1.1 500 kV GIS building.
  - 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
  - 1.1.2 RC and/or steel structure for roof.
  - 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation.
  - 1.1.4 Architectural of the whole building.
  - 1.1.5 The Contractor shall construct the building conformed to "IEEE STD-979- 1994 (R2004)" (IEEE Guide for Substation Fire Protection)
  - 1.1.6 500 kV GIS buildings shall be designed with reference to Dwg. No. SD-GIS-9-02A. Equipment layouts shall conform to electrical drawing Dwg. No. SE-GIS-0-01 and Dwg. No. LN3-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
  - 1.1.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
  - 1.1.8 Building facilities
    - Electricity and illumination system including cable work for illumination, ventilation system, power supply, 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.
    - Lightning protection system.
    - Emergency lighting system.
    - Cable routing and cable support (cable tray and cable ladder) installed in 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 be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
  - Signboard on building.
  - Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- 1.1.9 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. Construction of**

- 2.1 500 kV Relay Building (except structure & foundation).

### **Water Supply and Fire Protection System**

## **3. Design and construction of**

- 3.1 Water supply system.
- 3.2 Fire protection system for 500 kV GIS building:
- 3.2.1 GIS building shall consist of optical beam smoke detector and linear heat detector.
- 3.2.2 Fire protection system of GIS building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in an existing 230/115 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.
- 3.2.3 There shall be sounder and beacon on the roof of the building.
- 3.2.4 Fire protection system, fire alarm system and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:
- NFPA 70: National Electrical Code.
  - NFPA 72: National Fire Alarm Code.
  - NFPA 75: Standard for the Fire Protection of Information Technology Equipment.
  - NFPA 76: Standard for the Fire Protection of Telecommunications Facilities.
  - IEEE Std. 979: IEEE Guide for Substation Fire Protection.

- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations

3.3 Fire protection system for 500 kV Relay Building:

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

3.3.2 Fire protection system of Relay Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in an existing 230/115 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.

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

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

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

Zone 1: Equipment (Control/Relay) Room;

Zone 2: Electrical Room;

Zone 3: Under Raised Floor (If Required);

Zone 4: Battery Room;

Zone 5: Cable Room (If required);

Zone 6: Inert Gas Room

Other zone (If required)

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

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

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

i. Air Sampling Smoke Detector.

- (1) Shall consist of a high sensitivity type detector, using light scatter technology.

- (7) Detection system for all cabinet shall be omitted.

- (13) The minimum sensitivity settings for a single sampling hole are so that the detection system alarm at 1.5%obs/ft (4.95%obs/m).

A sampling hole maximum coverage area is 400.0 sq.ft (37.2 sq.m).

- (14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.

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

- NFPA 2001: Clean Agent Fire Extinguishing Systems.
- NFPA 70: National Electrical Code.
- NFPA 72: National Fire Alarm Code.
- NFPA 75: Standard for the Fire Protection of Information Technology Equipment.
- NFPA 76: Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.

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

3.3.8 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.

3.4 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.

3.5 Fire protection system for the Transformer and Shunt reactor: The Foam-Water Spray System shall comply with the following;

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

3.5.2 Bladder tank Vessel construction Standards: Carbon steel to ASME code section VIII for unfired pressure vessel.

3.5.3 Nozzles: NFPA 16 and as per Manufacturer's Recommendation.

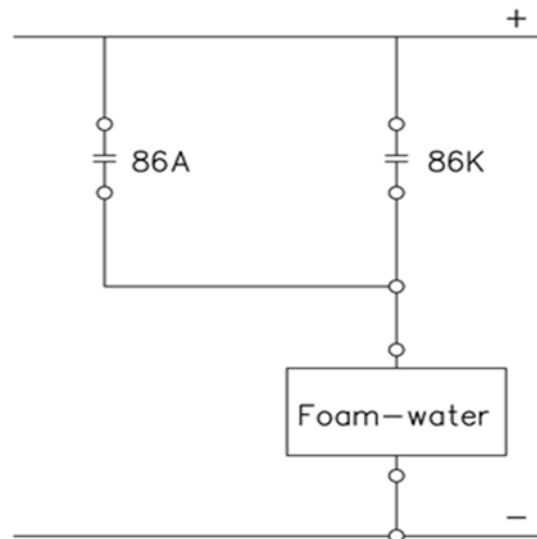
3.5.4 Detection system: Air Expansion Linear Heat Detection System (LHB).

3.5.5 Equipment for system: FM approved, UL Listings, Vds.

3.5.6 Foam-water spray system provided for Transformer/Shunt Reactor shall be designed for a density of 10.2 litre/min-sq.m. over the exposed surface at the Transformer.

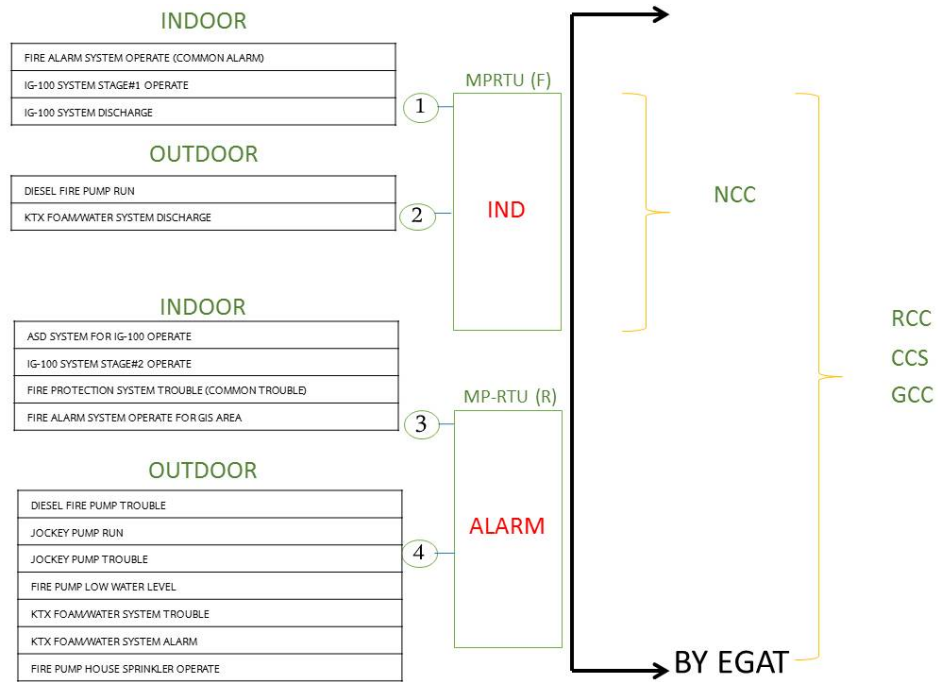
3.5.7 There shall be one linear heat detector box for each transformer/Shunt reactor.

- 3.6 Fire protection system for Transformer/Shunt reactor shall trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room in existing 230/115 kV Control building. The installation practice shall be in accordance with the latest edition of NFPA 72.
- 3.7 There shall be one fire alarm system graphic annunciator at each building to enable responding personnel to identify the location of a fire accurately and to indicate the status of emergency equipment or fire safety functions.
- 3.8 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (Fire pump houses, transformers, shunt reactors) at the building where control room locates.
- 3.9 Fire protection system circuits for buildings and switchyards: notification appliance circuits, and signaling line circuits, shall be class A circuit. Initiating device circuits can be class B circuit.
- 3.10 For Control System Logic as shown on specification 3001-13.4 item 4.1 shall be changed to the new detail as following;
- (4.1) In case of fire, heat detector and the tubular expansion detector first give alarm. If rate of rise/fixed temp in heat detector/tubular expansion detector sense fire condition, there shall be alarm in control room and the detected transformer shall be tripped before applying Foam-Water spray as the condition shown in the diagram below;



- 3.11 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;





- 3.12 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 3.13 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 3.14 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings:
- The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO<sub>2</sub>) conforming to TIS 881 and/or dry chemical conforming to TIS 332, capacity 10 lbs/set. The fitting accessories shall be provided.
  - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 3.15 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 3.16 Fire protection system work shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- 3.17 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.
- 3.18 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.

- 3.19 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1.
- 3.20 Underground water piping shall have indicator sign.
- 3.21 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).
- 3.22 Fire detection devices in substation shall be as table below.

<b>Protected Area</b>	<b>Detector</b>
1. Control, Relay and Telecommunication Rooms	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	- SD when environmental condition is acceptable. - LHD when environmental condition is out of range for SD - ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

**Abbreviations**

- 1. Heat detector, HD
- 2. Addressable Spot-Type Photoelectric Smoke detector, SD
- 3. Linear Heat Detector, LHD

- 4. Aspirated smoke detectors, ASD
- 5. Optical beam smoke detector, OBSD

- 3.23 Test and commissioning for fire protection system in switchyard.
- 3.24 Test and commissioning for foam water spray of each Transformer/Shunt reactor.
- 3.25 Test and commissioning for fire protection system of 500 kV GIS building.
- 3.26 Test and commissioning for IG-100 system for Relay Building and actual discharge test of IG-100 system in cable room of 500 kV Relay building.

**4. Construction of**

- 4.1 Foam house and accessories.
- 4.2 Cabinets with 2x50 lbs wheel fire extinguisher.

**Civil Work**

**5. Design and Construction of**

- 5.1 500 kV GIS Building.
- 5.2 500 kV Relay Building (structure & foundation).
  - 5.2.1 Minimum floor loading of substation shall be as SPECIFICATION NO.3001, 3001-10.1.2, except the lists below:
 

b. Control and communication room	1,250 kg/sq.m.
c. Removable raised floor	1,700 kg/sq.m.
d. Station battery room	1,600 kg/sq.m.
i. Platform area for Control and Communication	1,700 kg/sq.m.
m. Electrical room	1,700 kg/sq.m.

(Bidders are required to use floor load in accordance with the actual equipment load for Control and communication room, Removable raised floor for control room and electrical room, Station battery room, Platform area for Communication & Electrical and Electrical room. And floor load shall not be less than the minimum floor loading that specified by EGAT)
- 5.3 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
- 5.4 GIB & GIS bushing structure and foundation.
- 5.5 Transformer foundation.
- 5.6 Shunt reactor foundation.
- 5.7 Take-off with fire wall foundation (fire wall conformed to NFPA 850).
- 5.8 Take-off structure foundation.
- 5.9 Bus pole support structure foundation.

- 5.10 Surge arrester foundation.
- 5.11 Instrument transformer foundation.
- 5.12 Circuit Breaker foundation.
- 5.13 Disconnecting switch support foundation.
- 5.14 Marshalling kiosk foundation.
- 5.15 Neutral reactor foundation.
- 5.16 Common Control Cabinet foundation.
- 5.17 Road and drainage system.
- 5.18 Drainage system for cable trench.
- 5.19 Cable tray for transformer, underground cable in HDPE duct.
- 5.20 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
- 5.21 Noise barrier shall be designed, installed and tested to comply with the Announcement of National Environmental Board No.29 (2007) in order to protect the disturbing noise from the Shunt Reactor so that the Ambient Noise Level in the community surrounding the Substation does not rise higher than 10 decibels comparing to the Background Noise Level. According to EGAT's noise level data, the average Background Noise Level in 24 hours is at 42.8 to 48.9 decibels and the Shunt Reactor's noise level is at 74 decibels. The noise barrier shall be installed as followings:
  - Around the 500kV shunt reactor, with a distance of at least 3.50 meters from the equipment's surface. The barrier shall also have a height of at least 5.00 meters.
  - Parallel the fence and have a height of at least 5.00 meters.
  - The location shall be submitted to EGAT for approval.

## **6. Construction of**

- 6.1 Transformer loading and Dead man hook for loading transformer.
- 6.2 Bus pole support structure foundation.
- 6.3 Operating platform foundation.
- 6.4 Junction box support structure foundation.
- 6.5 Lamp post for fence and access road lighting LED type foundation.
- 6.6 Lighting relay panel foundation.
- 6.7 Equipment structure foundation with sub trench (if required).
- 6.8 Cable trench.
- 6.9 Road.
- 6.10 Crushed rock surfacing.
- 6.11 Wire mesh fence.

6.12 Site office.

7. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
8. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
9. All design, construction and testing shall be in accordance with Specification No.3001: Civil and Architectural Work.
10. EGAT's Soil Investigation Report attached to the Contract is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
11. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
12. The Contract price shall be adjusted (added or reduced) in case that the soil investigation results to be used for the design works is different from the layout and standard drawings.
13. The Contractor shall perform a static load test for 500 kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
14. Dynamic load test (DLT) according to ASTM D4945-89 shall be applied to at least 2% of driven piles (if driven pile type is required) except for driven pile of fence and lamp post.
15. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type is required).
16. 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.
17. The layout of Dwg. No. LN3-C-3, LN3-C-6 and LN3-C-9 shall be designed with reference to Dwg. No. TYP1A-C-3.1, TYP1-C-6 and TYP1-C-9 respectively.
18. According to the Contract Document Section G-3: Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows: the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

**Work not included in this Contract.**

1. Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4).

## **2. 500 KV MAE MOH 3 SUBSTATION (GIS)**

### **GENERAL**

The new 500 kV GIS Substation is located at Tumbon Mae Moh, Amphoe Mae Moh, Lampang Province. The new 500 kV Gas Insulated switchgear (GIS) is Breaker & A Half scheme.

### **Schedule 3: 500 kV Mae Moh 3 Substation (GIS)**

Six (6) Feeders of Breaker & A Half scheme at the new 500 kV GIS shall be provided for transmissions lines as follows:

- Two (2) Feeders for 500 kV Lines No. 1&2 to Lamphun 3
- Two (2) Feeders for 500 kV Lines No. 1&4 to Tha Tako
- Two (2) Feeders for 500 kV Lines to Existing 500 kV Substation Bay 2 & 2A

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

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

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

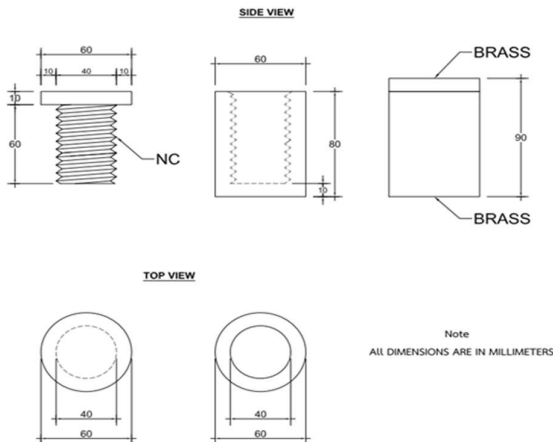
# **ELECTRICAL PART**

## **Work included in this Contract.**

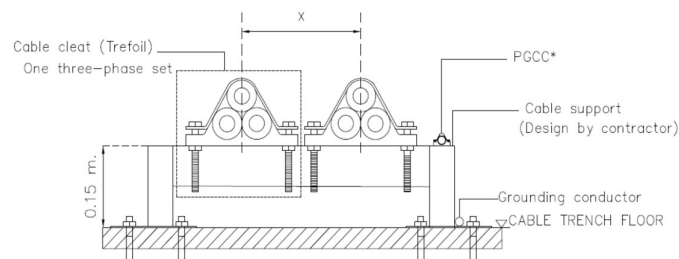
The Work included in this Contract to be performed by the Contractor shall be as specified in the Contract Documents and as follows:

### **1. 500 kV GIS and Conventional Substation**

- 1.1 Design, supply and installation of equipment required for a complete the new 500 kV GIS & 22 kV system.
- 1.2 Design, supply and installation of miscellaneous hardware required for as following:
  - 1.2.1 The connection between the new 500 kV substation & the existing 500 kV substation.
  - 1.2.2 The connection of 500 kV overhead line to the 110 & 55 MVar, 525 kV shunt reactor (SR6A, SR7A, SR8A & SR9A).
  - 1.2.3 The connection of the new 500 kV GIS air bushings to 500 kV overhead lines.
  - 1.2.4 The grounding equipment and miscellaneous hardware for 110 & 55 MVar, 525 kV shunt reactor (SR6A, SR7A, SR8A & SR9A).
- 1.3 To meet EGAT's service continuity requirements, the GIS gas compartment can be designed as indicated in the single line diagram or can be designed differently under a condition that the design of the gas compartment shall fulfill the requirements as specified in the Specification.
- 1.4 Supply and installation of the marking pins for the referenced positions from the main bus shall be provided in the GIS building. The positions of the marking pins shall be shown on the drawings for future GIS extension and the quantity shall be not less than 3 sets. The making pins shall be made of brass or stainless steel that have the formation as follows:



- 1.5 The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.
- 1.6 The detachable walk way (Cat walk) for visual inspection shall be properly installed on each GIS module and removable Service Platform, Removable Ladder shall be provided for GIS inspection.
- 1.7 Design, supply and installation of the equipment required for connecting the 22 kV tertiary of the 3x1-333.33 MVA, 500/230-22 kV auto-transformer to be delta form.
- 1.8 Design, supply and installation of the equipment required for connecting the 22 kV tertiary of the 300 MVA, 230/115-22 kV auto-transformer.
- 1.9 Design, supply and installation of 22 kV XLPE cable system which comprises at least the following:
  - 1.9.1 The design and calculation of the 22 kV cable system shall conform to IEC or IEEE standards.
  - 1.9.2 The 22 kV XLPE cable shall be single-core with copper conductor.
  - 1.9.3 Design, supply and installation of the 22 kV XLPE cables in a 22 kV system complete from one end at the 22 kV bus to the Station service transformers KW5A and KW6A, including cable trench, cable supporting structures, cable spacers, cable cleats, cable termination supporting structures, cable terminations, miscellaneous hardware, link box, SVL (if applicable) and all related equipment. The cable cleats shall be hot dip galvanized.
  - 1.9.4 The 22 kV XLPE cable shall be installed in trefoil formation as follows:



X : DESIGN BY CONTRACTOR

\*PGCC : PARALLEL GROUND CONTINUITY CONDUCTOR (IF REQUIRED)

- 1.9.5 The minimum bending radius of the 22 kV XLPE cable shall be checked by Contractor for cable installation and cable trench design.
- 1.9.6 The Contractor shall design the 22 kV cable system such that one (1) 1/C-35 Sq.mm XLPE cable shall be able to carry the continuous current not less than 50 A given that the ambient temperature is not less than 45 C° and the effect of solar heat shall be considered. The other parameters used in the design shall be practical, reasonable, operational and conform to IEC or IEEE standards. The calculated continuous current rating shall be



shown in the single line diagram. The calculation shall be submitted to EGAT for approval.

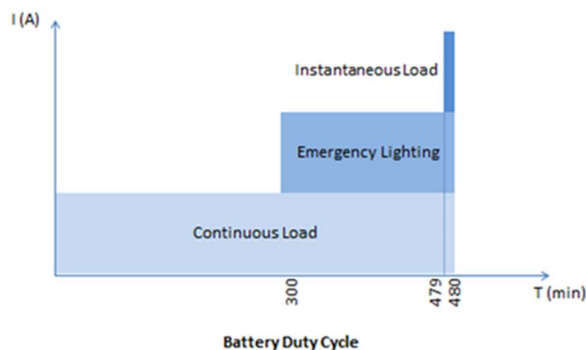
- 1.9.7 The Contractor shall design and select the type of metallic screen bonding. The induced voltage measured in every point of the metallic screen of 22 kV XLPE cables shall be less than 60 V or shall conform to the IEC or IEEE standards' calculation.
- 1.9.8 Design, supply and installation the equipment to protect the power cable from the surge voltage.
- 1.9.9 The abnormal condition which occurs from the design and installation of 22 kV XLPE cables for example ferroresonance etc. shall be responsible by the Contractor.
- 1.10 The feeder nameplates as well as phasing, device, and switching numbers shown on the GIS module shall be painted or mounted (detachable type) on the enclosure of GIS whichever is appropriate according to the instruction from EGAT GIS installation team.
- 1.11 The sag and tension of phase wires and overhead ground wires shall be calculated and designed according to internationally-accepted standards by the Contractor and the said calculation shall be submitted to EGAT for approval.

## **2. Station service system**

- 2.1 Design, supply and installation of station service system complete with integral accessories to provide a complete system operation. The station service system mainly consists of as follows:
  - 630 kVA, 22,000-400/230 V distribution transformers (KW5A)
  - 630 kVA, 22,000-400/230 V distribution transformers (KW6A)
  - Load Center Unit Substation (LCUS)
  - 22 kV drop-out fuses
  - 600 V, 1,000 A safety switches
  - 22 kV equipment, and AC&DC distribution boards, stationary batteries, battery chargers, power cables and all related equipment for the complete operation.
- 2.2 Design, supply and installation of equipment required for a complete 400/230 V power supply system.
- 2.3 Design, supply and installation of emergency lighting system for the GIS building and Control building in case of normal station service fails with the illuminance of 150 LUX for at least 3 hours as shown in figure below.
- 2.4 Design, supply and installation of the stationary battery, in which the battery is capable for delivering power to the control and protection for tripping all circuit breakers and emergency essential load at least 8 hours and emergency lighting at least 3 hours as shown in the figure below if normal station service fails. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international

standards. In addition, the size of the stationary battery shall be designed to support the operation of existing and future bay as shown on the attached Bidding Document Drawings. The calculation shall be submitted to EGAT for approval. The size of battery shall not be less than as follows:

- a) 1200 Ah for 500 kV Substation.
- b) 600 Ah for 230 kV Substation.



### 3. Grounding system

- 3.1 Design, supply and installation the grounding system of the new 500 kV Substation grounding system including the grounding system of 500 kV GIS building, Control building and 22 kV system.
- 3.2 The grounding conductor of the substation grounding system shall be of 4/0 AWG bare copper wire type.
- 3.3 The ground grid conductors spacing under the building area shall be the same as the Switchyard.
- 3.4 Design, supply and installation of the grounding equipment and miscellaneous hardware for 500/230 kV system including the 22 kV power supply system and 22 kV XLPE cable system.
- 3.5 The contractor shall evaluate the price of ground grid based on the specified design for price reference as below:
  - 3.5.1 The maximum ground grid conductor spacing ( $D_0$ ) shall be 5 meters.
  - 3.5.2 The number of ground rod shall be 100 pieces.
- 3.6 The Contractor shall conduct the soil resistivity measurement. The result shall be submitted to EGAT for approval.
- 3.7 The Contractor shall design a grounding grid based on the measured soil resistivity by hand calculation using the equations in IEEE-80 standard and submitted to EGAT for Approval. The parameters for grounding system calculation shall be used as follows;
  - Fault current division factor ( $S_f$ ) value = 1
  - Fault current (rms) = 50 kA
  - Time duration of fault = 1 second

These parameters shall be used for determine the size of grounding conductor for the substation grounding system. If the ground conductor spacing calculated by hand ( $D_1$ ) is less than the grounding conductor spacing for reference ( $D_0$ ), the Contractor shall design a grounding grid by using the software. The certification of software shall be acceptable for commercial use.

- 3.8 The contractor shall connect the grounding grid between the new 500 kV GIS area and the existing area at every 5 meters.
- 3.9 The Contractor shall connect the grounding grid between the additional area and the existing area.
- 3.10 The measurement of ground resistance at 500/230 kV substation shall be performed by the Contractor after completion of grounding system installation. Before the measurement, the overhead ground wire shall be disconnected from substation. The method of measurement shall follow the IEEE Std 81-2012, "IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System" or the latest versions. Then the result shall be submitted to EGAT.

#### **4. Lightning protection system**

- 4.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone. To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) is to be used in calculation instead of Critical Flashover voltage (CFO) as follows:

- a) 1550 kV for 500 kV Substation.
- b) 900 kV for 230 kV Substation.

For 22 kV Substation, the stroke current of 2 kA shall be used for the calculation.

- 4.2 For the design of lightning protection system for the 500 kV GIS building and relay building, the lightning protection level (LPL) shall be used level 1 for calculation and the overhead ground wire is not permitted. Air terminal rods installed at the roof shall be used instead.
- 4.3 Lightning protection system shall be designed to meet IEC, NEMA and E.I.T. standards or internationally-accepted standards.

#### **5. Facility system**

##### **5.1 Outdoor facility system**

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

- 5.1.2 The lamps for outdoor facility lighting system shall be LED type with all integral accessories, e. g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation.
  - 5.1.3 Design, supply and installation of circuits for remote control and door phone system of the main entrance gate. The control of the entrance gate shall be operated in both manual and remote-control modes which shall be controlled from either the control room or the guardhouse.
- 5.2 Indoor facility system
- 5.2.1 Design, supply and installation of the facility system which mainly consists of lighting system, grounding system, power supply, fire alarm and protection system, and ventilation system, air-conditioning system, and telephone & LAN system in the 500 kV GIS building and relay building. All cable wiring systems shall conform to NEC and IEC standards or internationally-accepted standards.
  - 5.2.2 The lamps for indoor facility lighting system shall be LED type with all integral accessories, e.g. lamp holders, fixtures, reflectors, and etc. The Contractor shall provide drawings that show details for installation and specify the LED lamp and LED luminaire circuit identified that the LED lamp circuit shall be supplied by 2 - 3 manufacturers. The power factor of the LED lamps shall be more than 0.9.
  - 5.2.3 All steel accessories e. g. lip-channel, conduit, conduit fittings, conduit accessories, box and cover shall be hot dip galvanized.
- 5.3 The size of low voltage cable shall be sufficient to keep the voltage drop at the load point less than 5% at rated load current.
- 5.4 The voltage drop from the safety switch to the AC boards and from the AC boards to the load shall not exceed 3% and 2% respectively.

## **6. Telecommunication system**

- 6.1 Design, supply and installation of the telecommunication tower and cable ladder for telecommunication system by modifying the TELECOMMUNICATION TOWER "WSA" TYPE as shown in Dwg. No. UWC-06-WSA-501, 502, 503 & 504 The said tower shall be constructed and divided into appropriate portions which are painted white and orange alternately with the top and bottom portions being painted orange. The obstruction lighting system shall be controlled by automatic flash box (AFB) that gives 30-60 flashes per minute. The AFB shall be turned on and turned off by a photo-light switch. The lightning protection for the telecommunication tower shall be calculated and designed by the contractor and the said calculation shall be submitted to EGAT for approval.

## **7. Other works**

- 7.1 Supply and installation of miscellaneous hardware required for suspension and station post insulators assembly.
- 7.2 Modification of Junction box supporting structure (JB001) for the installation of Safety switches.
- 7.3 Modification of Junction box supporting structure (JB003) for the installation of Outdoor Receptacle Box (ORB1 and ORB3).
- 7.4 Modification to 22 kV current transformer support structure (CS201) for installation of 22 kV current transformer and 22 kV voltage transformer.

## **8. Testing and Commissioning**

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

### **Work not included in this Contract**

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

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

# **CONTROL AND PROTECTION PART**

## **Work included in this Contract**

### **1. For 500 kV Mae Moh 3 Substation (New Control Room)**

- 1.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Swing rack type protective relay switchboards.
  - Transducer panel.
  - Interposing relay panel.
  - Marshalling panels for the remote terminal unit (Supplied by EGAT).
  - Marshalling panels for the fault recording system (Supplied by EGAT).
  - Marshalling panels for the control system.
  - Marshalling panel for the teleprotection.
  - Synchronizing panels and modify existing control circuit of existing breakers.
  - Fault Recording System.
  - Outdoor antenna and GPS receiver Panel.
  - Metering panels.
  - EFLEX and/or HDPE Conduit with hot-dip galvanized steel clamp.
  - 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.
- 1.2 Design, installation, wiring, test and commissioning of EGAT RTU which are supplied by EGAT. The configuration of database which is included in this Contract shall be fulfilled by the Contractor under EGAT's supervision.
- 1.3 Design, modification of the schematic drawing, installation and configuration of the application software, database, control function and display for the 500 kV and 230/115 kV EGAT CCS/RTU whereas the application software is supplied by EGAT. The installation shall be under EGAT's supervision.
- 1.4 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 1.5 Removal of the unused existing cables. The removed cables shall be neatly reeled and kept in a suitable place recommended by EGAT.
- 1.6 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

## **2. For 500 kV Mae Moh 3 Substation (Relay Building No.3)**

- 2.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Loose equipment as specified in the price schedules.
  - 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.
- 2.2 Design, modification, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Remove panel nos. 301R, 304R and 318R.
  - Modify existing direct transfer trip circuit (DTT) at panel nos. 302R, 303R, 319R and 320R to direct initiate by copper cable between relay building no.3 and the new control room.
  - Remove some equipment at panel nos. 302R, 303R, 319R and 320R.
  - Replace Transformer differential relay and add some equipment at panel nos. 308R, 309R and modify related panel.
  - Modify existing RTU panel to interface with new RTU systems which interfacing new control room.
- 2.3 Design, modification, wiring, configuration, calibration, test and commissioning of the existing fault recording systems. The modified input is about 40 digital inputs. The existing FRS is "IDM" model of Qualitrol.
- 2.4 Design, modification of the schematic drawing, configuration of database and wiring diagrams of the additional inputs for the existing 500 kV EGAT CCS/RTU. The test and commissioning of the completed EGAT CCS/RTU shall be performed by the Contractor. The configuration shall be under EGAT's supervision.
- 2.5 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 2.6 The existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.
- 2.7 Removal of the unused existing cables, equipment and panels. The removed cables which shall be neatly reeled and the removed panels shall be kept in a suitable place recommended by EGAT.
- 2.8 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

## **3. For 230 kV Mae Moh 3 Substation (Relay Building No.4)**

- 3.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
  - Loose equipment as specified in the price schedules.

- 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.
- 3.2 Design, modification, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment:
    - Modify transformer protection circuit which related to additional overvoltage relay and overcurrent relay.
    - Modify existing RTU panel to interface with new RTU systems which interfacing new control room.
  - 3.3 Design, modification, wiring, configuration, calibration, test and commissioning of the existing fault recording systems. The modified input is about 5 digital inputs. The existing FRS is “IDM” model of Qualitrol.
  - 3.4 Design, modification of the schematic drawing, configuration of database and wiring diagrams of the additional inputs for the existing 230 kV EGAT CCS/RTU. The test and commissioning of the completed EGAT CCS/RTU shall be performed by the Contractor. The configuration shall be under EGAT’s supervision.
  - 3.5 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
  - 3.6 The existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.
  - 3.7 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.

#### **4. For 230/115 kV Mae Moh 3 Substation (Relay Building No.1, 2, 5 and 6)**

- 4.1 Design, supply, installation, wiring, test and commissioning of the complete control and protection system which comprises of at least the following equipment :
  - Control circuit of 230kV and 115kV breaker for synchronizing panels (sync. panels be installed at new control room)
  - Modify existing RTU panel to interface with new RTU systems which interfacing new control room.
- 4.2 The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection system.
- 4.3 The existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.
- 4.4 The Contractor shall provide the draftman working at site during the commissioning stage in order to be in charge of writing the As-built Drawings of Control and Protection System.



**Work not included in this Contract**

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

## **COMMUNICATION PART**

### **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**

### **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:

#### **Architectural work**

##### **1. Design and Construction of**

- 1.1 500 kV GIS building.
  - 1.1.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
  - 1.1.2 RC and/or steel structure for roof.
  - 1.1.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation.
  - 1.1.4 Architectural of the whole building.
  - 1.1.5 The Contractor shall construct the building conformed to "IEEE STD-979- 1994 (R2004)" (IEEE Guide for Substation Fire Protection)
  - 1.1.6 500 kV GIS buildings shall be designed with reference to Dwg. No. SD-GIS-9-02A. Equipment layouts shall conform to electrical drawing. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
  - 1.1.7 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
  - 1.1.8 Building facilities
    - Electricity and illumination system including cable work for illumination, ventilation system, power supply, 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.
    - Lightning protection system.
    - Emergency lighting system.
    - Cable routing and cable support (cable tray and cable ladder) installed in 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 be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
  - Signboard on building.
  - Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
- 1.1.9 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.
- 1.2 500/230 kV Control Building.
- 1.2.1 Structure & foundation. The proper structure can be selected for the design and construction and shall be submitted to EGAT for approval.
  - 1.2.2 RC and/or steel structure for roof.
  - 1.2.3 Fire protection for steel structure shall conform to legal provision, EGAT's specifications and Design manual for substation. Therefore, Fire protection specification in Architecture drawing shall be cancelled.
  - 1.2.4 Architecture of the whole building.
  - 1.2.5 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).
  - 1.2.6 500/230 kV Control Building shall be designed with reference to Dwg. No. SD-CD-0-01A. Equipment layouts shall conform to electrical drawing. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
  - 1.2.7 Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
  - 1.2.8 Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
  - 1.2.9 Miscellaneous including grounding and labeling.
  - 1.2.10 Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
  - 1.2.11 Signboard on building and room name sign on each room.
  - 1.2.12 Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).
  - 1.2.13 Furniture as specified in Architectural Drawings.
  - 1.2.14 Size of battery room shall be not less than 6.20 x 13.50 meters, as indicated in electrical drawing. Therefore, the size of battery room in the architectural drawing shall be cancelled.

- 1.2.15 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.

## **Water Supply and Fire Protection System**

### **2. Design and Construction of**

- 2.1 Water supply system.
- 2.2 Fire protection system for 500 kV GIS building:
  - 2.2.1 GIS building shall consist of optical beam smoke detector and linear heat detector.
  - 2.2.2 Fire protection system of GIS building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected device, shown and recorded at control room in 500/230 kV Control Building. The installation practice shall be in accordance with the last edition of NFPA 72.
  - 2.2.3 There shall be sounder and beacon on the roof of the building.
  - 2.2.4 Fire protection system, fire alarm system and accessories shall be in accordance with the applicable requirements set forth in the latest edition of the following codes and standards:
    - NFPA 70: National Electrical Code.
    - NFPA 72: National Fire Alarm Code.
    - NFPA 75: Standard for the Fire Protection of Information Technology Equipment.
    - NFPA 76: Standard for the Fire Protection of Telecommunications Facilities.
    - IEEE Std. 979: IEEE Guide for Substation Fire Protection.
    - NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations
- 2.3 Fire protection system for 500/230 kV Control Building:
  - 2.3.1 Control Building shall consist of Total Flood Clean Agent Fire Suppression System with heat detector, addressable type smoke detector and aspirated smoke detector.
  - 2.3.2 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 latest edition of NFPA 72.
  - 2.3.3 There shall be sounder and beacon on the roof of the building.

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

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

Zone 1: Equipment (Control/Relay) Room;

Zone 2: Electrical Room;

Zone 3: Under Raised Floor (If Required);

Zone 4: Battery Room;

Zone 5: Cable Room (If required);

Zone 6: Inert Gas Room

Other zone (If required)

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

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

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

i. Air Sampling Smoke Detector.

(1) Shall consist of a high sensitivity type detector, using light scatter technology.

(7) Detection system for all cabinet shall be omitted.

(13) The minimum sensitivity settings for a single sampling hole are so that the detection system alarm at 1.5%obs/ft (4.95%obs/m). A sampling hole maximum coverage area is 400.0 sq.ft (37.2 sq.m).

(14) Maximum transport time from the most remote port to the detection unit of an air-sampling system shall be a maximum of 90 seconds.

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

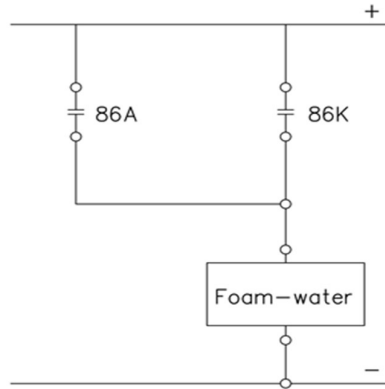
- NFPA 2001: Clean Agent Fire Extinguishing Systems.
- NFPA 70: National Electrical Code.
- NFPA 72: National Fire Alarm Code.
- NFPA 75: Standard for the Fire Protection of Information Technology Equipment.

- NFPA 76: Standard for the Fire Protection of Telecommunications Facilities.
  - IEEE Std 979: IEEE Guide for Substation Fire Protection
  - NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.
- 2.3.7 There shall be a protective clear polycarbonate cover which can be immediately lifted or opened for all IG-100 manual release stations.
- 2.3.8 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.
- 2.4 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.
- 2.5 Fire protection system for the Transformer/Shunt reactor: The Foam-water spray system shall comply with the following;
- 2.5.1 Foam-water spray system: NFPA 13, NFPA16 & NFPA 850.
  - 2.5.2 Bladder tank Vessel construction Standards: Carbon steel to ASME code section VIII for unfired pressure vessel.
  - 2.5.3 Nozzles: NFPA 16 and as per Manufacturer's Recommendation.
  - 2.5.4 Detection system: Air Expansion Linear Heat Detection System (LHB).
  - 2.5.5 Equipment for system: FM approved, UL Listings, Vds.
  - 2.5.6 Foam-water spray system provided for Transformer shall be designed for a density of 10.2 litre/min-sq.m. over the exposed surface at the Transformer/Shunt Reactor.
  - 2.5.7 There shall be one linear heat detector box for each transformer/Shunt reactor.
- 2.6 Fire Pump System. (Conforming to NFPA 14, 20, 22, 24, 72).
- 2.7 250 cu.m water storage tank, fire pump, and jockey pump shall have trouble and operation visual and audible signals (Environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room in 500/230 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.
- 2.8 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.
- 2.9 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.

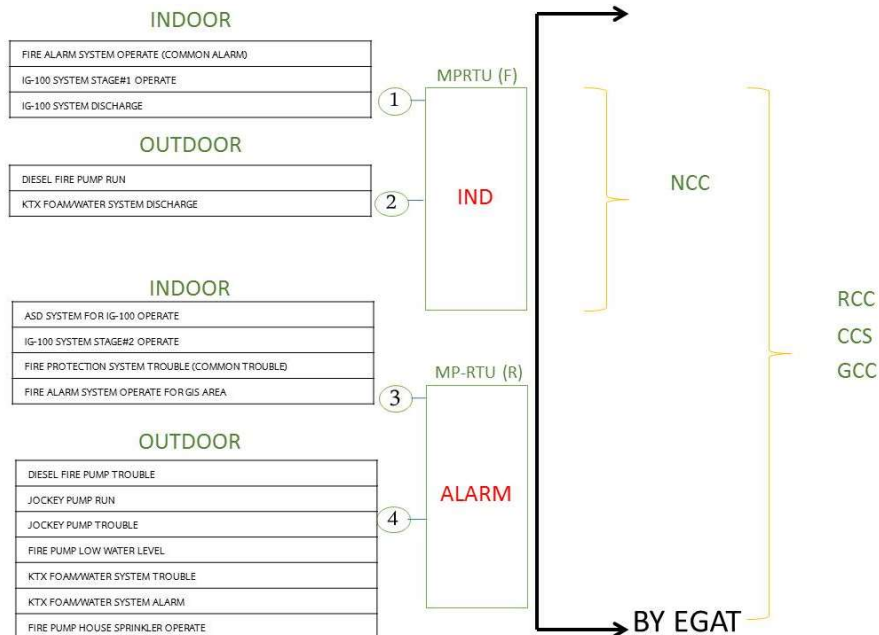
2.10 Fire protection system circuits for buildings and switchyards: notification appliance circuits, and signaling line circuits, shall be class A circuit. Initiating device circuits can be class B circuit.

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

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



2.12 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;





- 2.13 There shall be only one subcontractor engaging in design, supply and installation of Fire Protection System for Buildings and Switchyard.
- 2.14 All building wall openings for fire protection dampers shall be provided with stainless steel louvers and insect screens to install inside of building.
- 2.15 For portable fire extinguisher as shown on specification 3001- 10.13.3 shall be changed to the new details as followings:
  - The fire extinguishers shall be conformed to latest TIS standards. The portable and mobile fire extinguishers shall be carbon dioxide (CO<sub>2</sub>) conforming to TIS 881 and/or dry chemical conforming to TIS 332, capacity 10 lbs/set. The fitting accessories shall be provided.
  - The portable fire extinguishers shall be installed according to the latest NFPA 10.
- 2.16 There shall be safety signs for fire extinguisher, manual release station and fire alarm device.
- 2.17 Fire protection system work shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation.
- 2.18 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.
- 2.19 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.
- 2.20 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.
- 2.21 Pipe coating system shall conform to ASME A13.1 standard and ANSI-A13.1.
- 2.22 Underground water piping shall have indicator sign.
- 2.23 For Fire protection system design shall be conformed to NFPA 101 (Life Safety Code).

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

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Warehouse and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11. Cable Spreading Rooms and Cable Tunnels	- SD when environmental condition is acceptable. - LHD when environmental condition is out of range for SD - ASD in high risk area and required early response.
12. Main Cable Trench of GIS Area	LHD

#### Abbreviations

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

2.25 Test and commissioning for fire protection system in switchyard.

2.26 Test and commissioning for foam water spray of each Transformer/Shunt reactor.

2.27 Test and commissioning for fire protection system of 500 kV GIS building.

2.28 Test and commissioning for IG-100 system for Control Building and actual discharge test of IG-100 system in electrical room of 500/230 kV Control building.

### **3. Construction of**

- 3.1 Foam house and accessories.
- 3.2 Fire pump house.
- 3.3 Cabinets with 2 sets of 50 lbs wheel fire extinguisher.
- 3.4 Water storage tank for fire protection system (capacity not less than 250 cu.m).
- 3.5 Underground water tank 50 cu.m.
- 3.6 Water tank tower 15 cu.m.

### **Civil Work**

#### **4. Design and Construction of**

- 4.1 500 kV GIS Building.
- 4.2 500/230 kV Control Building.
  - 4.2.1 Floor loading as shown on specification 3001-10.1.2 shall be changed to the new details as followings:

b. Control and communication room	1,250 kg/sq.m.
c. Removable raised floor	1,700 kg/sq.m.
d. Station battery room	1,600 kg/sq.m.
i. Platform area for Control and Communication	1,700 kg/sq.m.
m. Electrical room	1,700 kg/sq.m.

(Bidders are required to use floor load in accordance with the actual equipment load for Control and communication room, Removable raised floor for control room and electrical room, Station battery room, Platform area for Communication & Electrical and Electrical room. And floor load shall not be less than the minimum floor loading that specified by EGAT)
- 4.3 Steel structure and foundations for Specified equipment and the others not shown in “For Construction drawings” and / or EGAT’s specification.
- 4.4 GIB & GIS bushing structure and foundation.
- 4.5 Transformer foundation.
- 4.6 Shunt reactor foundation.
- 4.7 Take-off with fire wall foundation (fire wall conformed to NFPA 850).
- 4.8 Take-off structure foundation.
- 4.9 Bus pole support structure foundation.

- 4.10 Bus support structure foundation.
- 4.11 Surge arrester foundation.
- 4.12 Instrument transformer foundation.
- 4.13 Circuit Breaker foundation.
- 4.14 Disconnecting switch support foundation.
- 4.15 Lightning arrester structure foundation.
- 4.16 Current transformer support structure foundation.
- 4.17 Marshalling kiosk foundation.
- 4.18 Neutral reactor foundation.
- 4.19 Disconnecting switch operating platform foundation.
- 4.20 500 kV Terminator support foundation.
- 4.21 Common Control Cabinet foundation.
- 4.22 Road and drainage system.
- 4.23 Drainage system for cable trench.
- 4.24 Cable trench for XLPE system with RC cover.
- 4.25 Cable tray for transformer, underground cable in HDPE duct.
- 4.26 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205.
- 4.27 Switchyard entrance gate (Sliding).
- 4.28 Wire mesh fence with L-shape foundation.

## **5. Construction of**

- 5.1 Transformer loading and Dead man hook for loading transformer.
- 5.2 Wire mesh fence.
- 5.3 Crushed rock surfacing.
- 5.4 Cable trench.
- 5.5 Road.
- 5.6 Bus pole support structure foundation.
- 5.7 Operating platform foundation.
- 5.8 Junction box support structure foundation.
- 5.9 Telecommunication tower.
- 5.10 Distribution transformer foundation.
- 5.11 Lamp post for fence and access road lighting LED type foundation.
- 5.12 Lighting relay panel foundation.
- 5.13 Oil separator.

- 5.14 Site office.
- 5.15 Garage house 5.50 x 18.00 m (6 cars).
6. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.
  7. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.
  8. All design, construction and testing shall be in accordance with Specification No.3001: Civil and Architectural Work.
  9. EGAT's Soil Investigation Report attached to the Contract is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.
  10. All foundations shall be as specified in layout drawing. Except the result of soil investigation shows that the specified foundations are not appropriate, the Contractor shall design the proposed foundations.
  11. The Contract price shall be adjusted (added or reduced) in case that the soil investigation results to be used for the design works is different from the layout and standard drawings.
  12. The Contractor shall perform a static load test for 500 kV GIS Building foundations in accordance with ASTM D1143 (if pile type foundation is required).
  13. 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.
  14. Seismic load test (sonic integrity test) according to ASTM D5882-96 shall be applied to all bored piles (if bored pile type 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. The layout of Dwg. No. MM3-C-3, MM3-C-6 and MM3-C-9 shall be designed with reference to Dwg. No. TYP1A-C-3.1, TYP1-C-6 and TYP1-C-9 respectively.
  17. According to the Contract Document Section G-3: Contractor's Office and Other Construction Facilities; the detail in paragraph 3 shall be changed as follows: the Contractor shall provide for EGAT an office container at the site during construction with a minimum space of 36 sq.m for office area, 24 sq.m for conference room which shall both be air-conditioned and 4 sq.m for toilet. The facilities as shown on the section G-3 are required for 2 sets.

**Work not included in this Contract.**

1. Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4).