Notice to Bidder

To comply with the ENGINEER ACT, B.E. 2542

FOR THE CONSTRUCTION WORK RELATED TO DESIGN OR CONSTRUCTION SUPERVISION WORK

The Contractors should be aware of the following:

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

NOTE : If you have any questions, please contact COUNCIL OF ENGINEERS THAILAND.
Address : 1616/1 Ladprao, Wangthonglang, Bangkok, Thailand 10310
Telephone : 1303
Email : coe@saraban.mail.go.th

ประชาสัมพันธ์ผู้ประกอบการเพื่อทราบ

เพื่อให้การดำเนินงานสำหรับงานจ้างก่อสร้างที่มีลักษณะงานด้านการออกแบบหรือควบคุมงานก่อสร้าง สอดคล้องกับพระราชบัญญัติวิศวกร พ.ศ. 2542 จึงขอแจ้งแนวทางในการดำเนินงาน ดังนี้

1. ผู้รับจ้างที่เป็นนิติบุคคล ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

2. ผู้รับจ้างที่ดำเนินการในรูปแบบของ “กิจการร่วมค้า”

(1) กรณีที่กิจการร่วมค้าได้จดทะเบียนเป็นนิติบุคคลใหม่ กิจการร่วมค้านั้นต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

(2) กรณีที่กิจการร่วมค้าไม่ได้จดทะเบียนเป็นนิติบุคคลใหม่ เฉพาะนิติบุคคลที่มีหน้าที่เป็นผู้รับผิดชอบงานวิศวกรรมออกแบบหรือควบคุม ต้องเป็นผู้ที่ได้รับใบอนุญาตประกอบวิชาชีพวิศวกรรมควบคุมสำหรับนิติบุคคลจากสภาวิศวกร

หมายเหตุ หากมีข้อสงสัย โปรดติดต่อ สภาวิศวกร

ที่อยู่ : 1616/1 ถนนลาดพร้าว แขวงวังทองหลาง เขตวังทองหลาง กรุงเทพมหานคร 10310

เบอร์ติดต่อ : 1303

อีเมล : coe@saraban.mail.go.th

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

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

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

The Redaction of Sensitive Personal Data

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

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

ประกาศความเป็นส่วนตัว (Privacy Notice) สำหรับการจัดซื้อจัดจ้าง การบริหารพัสดุ และการบริหารสัญญาของ กฟผ.

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

การขีดฆ่าข้อมูลส่วนบุคคลอ่อนไหว

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

Notice to Bidder

Subject : Online Payment for Purchase of Bidding Documents

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

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

   Payment shall be made by bank transfer or telegraphic transfer to EGAT's account no. 109-6-01958-2 (swift code : KRTHTHBK), Krung Thai Bank Public Company Limited, Bangkruai Branch, Nonthaburi.

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

2) The registration will be deemed complete only upon successful processing of the payment and confirmation of funds received.

3) After the payment has been verified for approximately 3 working days, the in-charge officer will send the link for downloading the bidding documents together with the receipt to the purchaser's email address in the Registration Form.

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Invitation to Bid No. NPUP-S-01

Supply and Construction of 500 kV Den Chai Substation (GIS) and
Improvement of 500 kV Mae Moh 3 and 500 kV Tha Tako Substations
Transmission System Development in the Area of Nan Phrae and
Uttaradit Provinces for Power Purchase from Lao PDR Projects
Two-Envelope

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

Place of Construction : Den Chai Substation (GIS), Mae Moh 3 Substation and Tha Tako Substation

Medium Cost (including Value Added Tax and other expenses) : THB 2,100,000,000.-

Eligibility of Bidders

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

Availability of Bidding Documents

Bidding Documents are available for online purchase during 8:00 hrs. to 15:00 hrs., Bangkok Standard Time, as from February 3, 2026 to February 27, 2026 at USD 1,000.- or THB 30,000.- per copy, non-refundable.

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

Delivery of Bids

Technical and price proposal shall be submitted at Bidding Room, 1st Floor, Tor 137 Building at EGAT's Head Office, Nonthaburi during 09:00 hrs. to 10:00 hrs., Bangkok Standard Time, March 31, 2026 and Technical Proposal will be opened publicly at 10:00 hrs.

ELECTRICITY GENERATING AUTHORITY OF THAILAND

February 3, 2026

Wallapa Chewadhnakorlkul

(Miss Wallapa Chewadhnakorlkul)
Chief, Procurement Department – Transmission System Segment

ประกาศการไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

เรื่อง ประกวดราคาจ้าง เลขที่ NPUP-S-01

ประกวดราคาแบบ 2 ซอง

การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย (กฟผ.) มีความประสงค์จะจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500 kV เด่นชัย (GIS) และจัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 500 kV แม่เมาะ 3 และสถานีไฟฟ้าแรงสูง 500 kV ท่าตะโก สำหรับโครงการพัฒนาระบบส่งไฟฟ้าบริเวณจังหวัด น่าน แพร่ และ อุตรดิตถ์ เพื่อรับซื้อไฟฟ้าจากโครงการในสาธารณรัฐประชาธิปไตยประชาชนลาว โดยทำสัญญาแบบปรับราคาได้ (ค่า k) โดยใช้งบประมาณ กฟผ.

สถานที่ก่อสร้าง : สถานีไฟฟ้าแรงสูงเด่นชัย (GIS) สถานีไฟฟ้าแรงสูงแม่เมาะ 3 และ สถานีไฟฟ้าแรงสูงท่าตะโก

ราคากลาง (รวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ) : 2,100,000,000.- บาท

คุณสมบัติของผู้เสนอราคา

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

การขายเอกสารประกวดราคา

ผู้สนใจติดต่อซื้อเอกสารประกวดราคา ในราคาชุดละ 30,000.- บาท ในวันทำการระหว่างเวลา 08:00 น. ถึง 15:00 น. ตั้งแต่วันที่ 3 กุมภาพันธ์ 2569 ถึงวันที่ 27 กุมภาพันธ์ 2569 ทั้งนี้ สามารถดูรายละเอียดการซื้อเอกสารประกวดราคาได้ที่เว็บไซต์ https://www4.egat.co.th/fprocurement/biddingeng หรือสอบถามข้อมูลเพิ่มเติมได้ทางโทรศัพท์ หมายเลข 0 2436 0342 หรืออีเมล procurement.tse@egat.co.th

การยื่นซองประกวดราคา

กำหนดยื่นซองข้อเสนอด้านเทคนิคพร้อมซองราคา ในวันที่ 31 มีนาคม 2569 เวลา 09:00 น. ถึง 10:00 น. และเปิดซองข้อเสนอด้านเทคนิคเวลา 10:00 น. ณ ห้องประกวดราคา ชั้น 1 อาคาร ท.137 การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย เชิงสะพานพระราม 7 จังหวัดนนทบุรี

ประกาศ ณ วันที่ 3 กุมภาพันธ์ 2569

(นางสาววัลลภา ชีวธนากรณ์กุล)

หัวหน้ากองจัดซื้อจัดจ้างสายงานระบบส่ง

ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)
ในการจัดซื้อจัดจ้างที่มิใช่งานก่อสร้าง

1. **ชื่อโครงการ** Bid No. NPUP-S-01
การจัดซื้อและจ้างก่อสร้างสถานีไฟฟ้าแรงสูง 500 kV เด่นชัย (GIS) และจัดซื้อและจ้างก่อสร้างปรับปรุงสถานีไฟฟ้าแรงสูง 500 kV แม่เมาะ 3 และสถานีไฟฟ้าแรงสูง 500 kV ท่าตะโก โครงการพัฒนาระบบส่งไฟฟ้าบริเวณจังหวัด น่าน แพร่ และ อุตรดิตถ์ เพื่อรับซื้อไฟฟ้าจากโครงการใน สปป.ลาว
/หน่วยงานเจ้าของโครงการ ฝ่ายแผนงานและโครงการระบบส่ง การไฟฟ้าฝ่ายผลิตแห่งประเทศไทย

2. **วงเงินงบประมาณที่ได้รับจัดสรร**
โครงการพัฒนาระบบส่งไฟฟ้าบริเวณจังหวัด น่าน แพร่ และ อุตรดิตถ์ เพื่อรับซื้อไฟฟ้าจากโครงการใน สปป.ลาว งบประมาณ 26,220 ล้านบาท

3. **วันที่กำหนดราคากลาง** 11 ธันวาคม 2568 (วันที่ รวร. อนุมัติ)
ราคารวมภาษีมูลค่าเพิ่มและค่าใช้จ่ายอื่นๆ เป็นเงิน 2,100,000,000.00 บาท **ราคา/หน่วย** ตามเอกสารแนบ

4. **แหล่งที่มาของราคากลาง**
หลักเกณฑ์การกำหนดราคากลางการจัดซื้อและจัดจ้างงานก่อสร้างระบบส่งไฟฟ้าของสายงานพัฒนาระบบส่ง

5. **รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง**

5.1 นายณัฏฐ์ วงศ์เทพวาณิชย์	หมฟ-ร. กวอ-ร.
5.2 นายภูภัทร พานทอง	หสก-ร. กวอ-ร.
5.3 นายภานุวัฒน์ ลิขิตผลผดุง	หวอ-ร. กวอ-ร.
5.4 น.ส.จารุวรรณ พิพัฒน์มงคลพร	หอต-ร. กวอ-ร.
5.5 นายรุหาญ รุจิธัญธาร	กวป-ร.
5.6 นายมณเฑียร จำปาอ่อน	กวธ-ร.
5.7 นายสมประสงค์ พัฒนคุณเจริญกิจ	กวส-ส. อรส.

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

MEDIUM COST FOR BID NO. NPUP-S-01

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS) AND IMPROVEMENT OF 500 KV MAE MOH 3 AND 500 KV THA TAKO SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Schedule	Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
			Amount	Amount	Amount	Amount	Amount
1	500 KV DEN CHAI SUBSTATION (GIS)	THB	1,131,506,556.65				
				232,882,714.41	406,847,230.49	1,581,171.43	166,070,369.86
2	500 KV MAE MOH 3 SUBSTATION						
				2,726,512.00			1,216,391.00

นายสมชัย เจริญศรีเกษม
ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง
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MEDIUM COST FOR BID NO. NPUP-S-01

SUMMARY OF BID PRICE

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS) AND IMPROVEMENT OF 500 KV MAE MOH 3 AND 500 KV THA TAKO SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Schedule	Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
			Foreign Supply	Local Supply			
			CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
			Amount	Amount	Amount	Amount	Amount
3	500 KV THA TAKO SUBSTATION	THB	1,460.80				
				104,239.80			908,745.97
BID PRICE		THB	1,131,508,017.45	Baht 235,713,466.21	Baht 406,847,230.49	Baht 1,581,171.43	Baht 168,195,506.83
OTHER EXPENSES		THB	22,630,160.35				
VAT			80,789,672.45	Baht 16,499,942.63	Baht 28,479,306.13	Baht 110,682.00	Baht 11,773,685.48
SUMMARY OF BID PRICE		THB	1,234,927,850.25	Baht 252,213,408.84	Baht 435,326,536.62	Baht 1,691,853.43	Baht 179,969,192.31
TOTAL MEDIUM COST		THB	2,104,128,841.45				
TOTAL MEDIUM COST (ROUND)		THB	2,100,000,000.00				

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MEDIUM COST FOR BID NO. NPUP-S-01
SCHEDULE 1 : 500 KV DEN CHAI SUBSTATION (GIS)
SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount	Amount	Amount
PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	1,126,985,723.85	229,014,019.61			166,070,369.86
PART 1C : CIVIL WORK				406,847,230.49		
PART 1D : SUPPLY OF SPARE PARTS	THB	4,520,832.80	3,868,694.80		1,581,171.43	
TOTAL PRICE	**THB**	**1,131,506,556.65**	**Baht** **232,882,714.41**	**Baht** **406,847,230.49**	**Baht** **1,581,171.43**	**Baht** **166,070,369.86**

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB2 : Distribution Transformer			514,000.00	51,400.00
Schedule 1AB4 : Surge Arrester	THB	12,930,000.00	1,620,000.00	1,455,000.00
Schedule 1AB6 : Coupling Capacitor Voltage Transformer, Coupling Capacitor, Voltage Transformer and Junction Box	THB	19,494,000.00	1,939,000.00	2,143,300.00
Schedule 1AB7 : SF6 Gas Insulated Switchgear	THB	1,015,889,728.00		101,588,972.80

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	**Supply of Equipment**		**Local Transportation, Construction and Installation** (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB9 : Power Circuit Breaker	THB	45,971,287.51		4,597,128.75
Schedule 1AB10 : Disconnecting Switch	THB	15,160,391.40	1,710,654.00	1,687,104.54
Schedule 1AB12 : AC&DC Distribution Board and Termination Box			3,570,913.42	357,091.34
Schedule 1AB13 : Stationary Battery and Battery Charger	THB	6,803,451.24	2,866,869.51	967,032.08

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB14 : Substation Steel Structure			38,555,105.00	9,638,776.25
Schedule 1AB15 : Insulator				277,662.00
Schedule 1AB18 : Low Voltage Cable and Conductor			89,386,088.00	22,346,522.00
Schedule 1AB19 : Switchyard Lighting Fixtures			2,144,451.08	536,112.77

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware	THB	1,662,645.60		415,661.40
Schedule 1AB21 : Bus Fitting	THB	5,418,492.20		1,354,623.05
Schedule 1AB22 : Grounding Material	THB	3,219,687.90	2,270,307.60	1,372,498.88
Schedule 1AB23 : Substation Miscellaneous	THB	436,040.00	945,944.00	345,496.00

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	**Supply of Equipment**		**Local Transportation, Construction and Installation** (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB24 : Control and Protection System			71,634,505.00	7,217,838.15
Schedule 1AB25 : Fault Recording System			8,205,785.00	841,053.95
Schedule 1AB30 : Station Service Voltage Transformer				5,244,000.00

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PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	**Supply of Equipment**		**Local Transportation, Construction and Installation** (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB33 : CCTV			2,632,597.00	365,185.00
Schedule 1AB34 : 48 VDC Stationary Battery, Battery Charger and DC Power Panel			712,100.00	136,400.00
Schedule 1AB35 : Communication Cable			305,700.00	696,900.00

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	**Supply of Equipment**		**Local Transportation, Construction and Installation** (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 1AB38 : Remote Terminal Unit				1,154,610.90
Schedule 1AB39 : Commissioning				1,280,000.00
PART 1AB	**THB**	**1,126,985,723.85**	**Baht 229,014,019.61**	**Baht 166,070,369.86**

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1C : CIVIL WORK

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	**Local Currency** (excluding VAT) Baht Amount
Schedule 1C1 : Foundation Work	36,489,502.00
Schedule 1C2 : Cable Trench	12,417,034.00
Schedule 1C3 : Building	242,571,369.37
Schedule 1C4 : Earth Work, Road and Crushed Rock Surfacing	14,732,000.00
Schedule 1C5 : Water Supply System	1,357,316.00
Schedule 1C6 : Drainage System	37,947,969.50
Schedule 1C7 : Special Construction Works	13,016,347.62
Schedule 1C8 : Miscellaneous	4,358,567.00
Schedule 1C9 : Fire Protection System	43,957,125.00
PART 1C	**Baht** **406,847,230.49**

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1D : SUPPLY OF SPARE PARTS

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount
Schedule 1D7 : Spare Parts for SF6 Gas Insulated Switchgear	THB	2,610,286.80		130,514.34
Schedule 1D12 : Spare Parts for AC&DC Distribution Board and Termination Box			63,577.80	3,178.89
Schedule 1D22 : Spare Parts for Grounding Material	THB	1,910,546.00		95,527.30

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 1D : SUPPLY OF SPARE PARTS

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount
Schedule 1D24 : Spare Parts for Control and Protection System			3,222,791.00	20,475.45
Schedule 1D25 : Spare Parts for Fault Recording System			582,326.00	20,475.45
Schedule 1D30 : Spare Parts for Station Service Voltage Transformer				1,311,000.00
PART 1D	**THB**	**4,520,832.80**	**Baht 3,868,694.80**	**Baht 1,581,171.43**

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MEDIUM COST FOR BID NO. NPUP-S-01
SCHEDULE 2 : 500 KV MAE MOH 3 SUBSTATION
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount	Amount	Amount
PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT			2,726,512.00			1,216,391.00
TOTAL PRICE			**Baht 2,726,512.00**	**Baht**	**Baht**	**Baht 1,216,391.00**

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PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	**Supply of Equipment**		**Local Transportation, Construction and Installation** (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 2AB23 : Substation Miscellaneous			28,800.00	7,920.00
Schedule 2AB24 : Control and Protection System			2,697,712.00	492,071.00
Schedule 2AB25 : Fault Recording System				24,000.00

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 2AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 2AB38 : Remote Terminal Unit				52,400.00
Schedule 2AB39 : Commissioning				640,000.00
PART 2AB			**Baht 2,726,512.00**	**Baht 1,216,391.00**

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MEDIUM COST FOR BID NO. NPUP-S-01
SCHEDULE 3 : 500 KV THA TAKO SUBSTATION
SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Currency	Local Transportation	Local Transportation, Construction and Installation
		Foreign Supply	Local Supply			
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht	(excluding VAT) Baht
		Amount	Amount	Amount	Amount	Amount
PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT	THB	1,460.80	104,239.80			908,745.97
TOTAL PRICE	**THB**	**1,460.80**	**Baht 104,239.80**	**Baht**	**Baht**	**Baht 908,745.97**

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PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 3AB18 : Low Voltage Cable and Conductor			43,670.00	12,009.25
Schedule 3AB21 : Bus Fitting	THB	1,460.80		401.72
Schedule 3AB22 : Grounding Material			14,341.80	3,944.00

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PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 3AB23 : Substation Miscellaneous			28,800.00	7,920.00
Schedule 3AB24 : Control and Protection System			17,428.00	161,171.00
Schedule 3AB25 : Fault Recording System				29,300.00

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MEDIUM COST FOR BID NO. NPUP-S-01

PART 3AB : SUPPLY AND INSTALLATION OF SUBSTATION EQUIPMENT

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Description	Currency	Supply of Equipment		Local Transportation, Construction and Installation (excluding VAT) Baht
		Foreign Supply	Local Supply	
		CIF Thai Port	Ex-works Price (excluding VAT) Baht	
		Amount	Amount	Amount
Schedule 3AB38 : Remote Terminal Unit				54,000.00
Schedule 3AB39 : Commissioning				640,000.00
PART 3AB	**THB**	**1,460.80**	**Baht 104,239.80**	**Baht 908,745.97**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB2 : Distribution Transformer

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB2-1	150 kVA, 400-400/230V distribution transformer, oil immersed, outdoor type as per Ratings and Features RF DX0404	1					514,000.00	514,000.00	XXXXX	XXXXX
1AB2-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB2-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	51,400.00	51,400.00
Total Price for Schedule 1AB2							**Baht**	**514,000.00**	**Baht**	**51,400.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB4 : Surge Arrester

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB4-1	396 kV Surge Arrester completed with corona ring, grading ring as per Ratings and Features RF SA9Y11	30		THB	431,000.00	12,930,000.00			XXXXX	XXXXX
1AB4-2	Steel Supporting Structure for SA9Y11 (for Item No. 1AB4-1), H=9.00 m as per Dwg. No. ST-LA-9-01 and SD-AB-0-01	30					54,000.00	1,620,000.00	XXXXX	XXXXX
1AB4-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB4-1 thru 1AB4-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,455,000.00	1,455,000.00
Total Price for Schedule 1AB4				**THB**		**12,930,000.00**	**Baht**	**1,620,000.00**	**Baht**	**1,455,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

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

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
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	30		THB	649,800.00	19,494,000.00			XXXXX	XXXXX
1AB6-2	Steel Supporting Structure for PD9W11 (for Item No. 1AB6-1), H=9.00 m as per Dwg. No. ST-VT-9-01 and SD-AB-0-01	30					51,300.00	1,539,000.00	XXXXX	XXXXX
1AB6-3	Junction Box type PT7 (for Item No. 1AB6-1) as per Dwg. No. TP-E-18.1-3/4, TP-E-18.4 and TP-E-18.5	10					40,000.00	400,000.00	XXXXX	XXXXX
1AB6-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB6-1 thru 1AB6-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	2,143,300.00	2,143,300.00
Total Price for Schedule 1AB6				**THB**		**19,494,000.00**	**Baht**	**1,939,000.00**	**Baht**	**2,143,300.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB7-1	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.2 to Mae Moh 3)	1		THB	126,986,216.00	126,986,216.00			XXXXX	XXXXX
1AB7-2	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.3 to Mae Moh 3 & Line No.1 to Nan)	1		THB	190,479,324.00	190,479,324.00			XXXXX	XXXXX
1AB7-3	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.4 to Mae Moh 3 & Line No.3 to Tha Tako)	1		THB	190,479,324.00	190,479,324.00			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB7-4	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.1 to Tha Tako & Line No.1 to Mae Moh 3)	1		THB	190,479,324.00	190,479,324.00			XXXXX	XXXXX
1AB7-5	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.2 to Nan & Line No.4 to Tha Tako)	1		THB	190,479,324.00	190,479,324.00			XXXXX	XXXXX
1AB7-6	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Line No.2 to Tha Tako)	1		THB	126,986,216.00	126,986,216.00			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB7-7	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) and Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01 (Metal Enclosed Bus) including VTs and fast-acting earthing switches at main bus	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-8	550 kV 4000 A 50 kA Gas Insulated Switchgear as per Ratings and Features RF IS9450(IEC) outdoor type (GIB) as per Drawing No. DC-S-1-01/02, DC-S-1-02/02 and DC-S-2-01/01	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-9	Local control cubicle for IS9450 for item 1AB7-1 thru 1AB7-8*	16		THB	included	included			XXXXX	XXXXX
1AB7-10	Steel Supporting Structure for IS9450*	1	lot	THB	included	included			XXXXX	XXXXX
1AB7-11	Removable service platform and removable ladder for GIS inspection*	1	lot	THB	included	included			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB7 : SF6 Gas Insulated Switchgear

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB7-12	Cost of Local Transportation, Construction and Installation for Item No. 1AB7-1 thru 1AB7-11	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	101,588,972.80	101,588,972.80
	Note : The SF6 gas in a quantity equivalent to 115% of the total equipment actual requirement shall be provided as follows: - 100% of SF6 gas quantity shall be shipped in returnable steel bottles which shall be returned back to Contractor. - 15% of SF6 gas quantity shall be shipped in non-returnable steel bottles which shall become the property of EGAT.									
Total Price for Schedule 1AB7				**THB**	**1,015,889,728.00**		**Baht**		**Baht**	**101,588,972.80**

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

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB9 : Power Circuit Breaker

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB9-1	550 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 0.55 Mvar neutral reactor with earthed neutral)	2		THB	5,795,296.10	11,590,592.20			XXXXX	XXXXX
1AB9-2	Circuit breaker marshalling KIOSK for Item No. 1AB9-1	2		THB	657,891.30	1,315,782.60			XXXXX	XXXXX
1AB9-3	Steel Supporting Structure for CB995R(IEC)* for Item No. 1AB9-1	2		THB	146,029.00	292,058.00			XXXXX	XXXXX
1AB9-4	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with two Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 1AB9-1	1		THB	2,201,690.70	2,201,690.70			XXXXX	XXXXX
1AB9-5	550 kV 4000 A 50 kA GCB 1&3 pole trip as per Ratings and Features RF CB995R(IEC) (for 525 kV 110 Mvar Y-connected five-limbed core type shunt reactor with 124 kV 0.865 Mvar neutral reactor with earthed neutral)	4		THB	5,795,296.10	23,181,184.40			XXXXX	XXXXX
1AB9-6	Circuit breaker marshalling KIOSK for Item No. 1AB9-5	4		THB	657,891.30	2,631,565.20			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB9 : Power Circuit Breaker

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB9-7	Steel Supporting Structure for CB995R(IEC)* for Item No. 1AB9-5	4		THB	146,029.00	584,116.00			XXXXX	XXXXX
1AB9-8	Swing Rack Cabinet as per dwg. no. TP-E-10.1 completed with four Controlled Switching Device (CSD) and Control Cable link between Power Circuit Breaker and CSD (include to CT/ VT) for Item No. 1AB9-5	1		THB	4,174,298.41	4,174,298.41			XXXXX	XXXXX
1AB9-9	Cost of Local Transportation, Construction and Installation for Item No. 1AB9-1 thru 1AB9-8	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	4,597,128.75	4,597,128.75
Total Price for Schedule 1AB9				**THB**		**45,971,287.51**	**Baht**		**Baht**	**4,597,128.75**

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

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB10 : Disconnecting Switch

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
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 = 7.5 m)	6		THB	2,526,731.90	15,160,391.40			XXXXX	XXXXX
1AB10-2	Steel Supporting Structure for DS99KI(IEC) as per EGAT's Dwg. No. ST-DS-9-01 and SD-AB-0-01, H = 9.00 m. (The structure shall have three phases per set and shall be suitable for connecting with an earth fixed point (Item no. 1AB22-5) on the opposite side of grounding blade)	6					285,109.00	1,710,654.00	XXXXX	XXXXX
1AB10-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB10-1 thru 1AB10-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,687,104.54	1,687,104.54
Total Price for Schedule 1AB10				**THB**		**15,160,391.40**	**Baht**	**1,710,654.00**	**Baht**	**1,687,104.54**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB12 : AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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	400/230 Vac Load Center Unit Substation (LCUS) as per Dwg. No. SE-LCUS-0-01 and TYP1A-L-5-01	1					975,964.00	975,964.00	XXXXX	XXXXX
1AB12-2	Lighting Relay Panel (LRP) as per Dwg. No. LT-RP-0-03	1					111,958.00	111,958.00	XXXXX	XXXXX
1AB12-3	Safety switch 600 Vac 500 A, 4 wire, S/N, 3 blades, 3 fuses time lag type, outdoor enclosure (Galvannealed steel or painted stainless steel, IP43, at least 2 mm thickness) completed with 500 A fuses. The terminal lug shall be suitable for ; - Incoming cable size : 1(3-1/C x 240 Sq.mm) Power Cable (Copper). 1(3-1/C x 240 Sq.mm) Power Cable (Copper) for Neutral. - Outgoing cable size : 3(3-1/C x 240 Sq.mm) Power Cable (Copper). 2(1-1/C x 240 Sq.mm) Power Cable (Copper) for Neutral.	2					282,585.01	565,170.02	XXXXX	XXXXX
1AB12-4	Termination Box type TB1 as per Dwg No. LT-TB-0-01	10					2,800.60	28,006.00	XXXXX	XXXXX
1AB12-5	Outdoor Receptacle Box type ORB1 as per Dwg. No. SE-ORB-0-01 (for oil separator)	2					25,234.00	50,468.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB12 : AC&DC Distribution Board and Termination Box

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB12-6	Outdoor Receptacle Box type ORB2 as per Dwg. No. SE-ORB-0-01 (for general purpose)	3					44,576.40	133,729.20	XXXXX	XXXXX
1AB12-7	Power Box (PRB-1 Type I) as per Dwg. No. LT-EQ-0-01	1					63,368.80	63,368.80	XXXXX	XXXXX
1AB12-8	Power Box (PRB-2) as per Dwg. No. LT-EQ-0-01	1					63,368.80	63,368.80	XXXXX	XXXXX
1AB12-9	Molded Case Selector Switch 125Vdc	1					61,404.20	61,404.20	XXXXX	XXXXX
1AB12-10	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	1					225,717.80	225,717.80	XXXXX	XXXXX
1AB12-11	400/230 Vac Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Room, designed by Contractor)	1					225,717.80	225,717.80	XXXXX	XXXXX
1AB12-12	125 Vdc Power Panel as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	2					187,092.40	374,184.80	XXXXX	XXXXX
1AB12-13	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For Control Room, designed by Contractor)	2					172,964.00	345,928.00	XXXXX	XXXXX
1AB12-14	125 Vdc Distribution Board as per Dwg. No. TP-E-4.4 (For GIS Room, designed by Contractor)	2					172,964.00	345,928.00	XXXXX	XXXXX
1AB12-15	Cost of Local Transportation, Construction and Installation for Item No. 1AB12-1 thru 1AB12-14	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	357,091.34	357,091.34

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB12 : AC&DC Distribution Board and Termination Box

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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
Total Price for Schedule 1AB12							**Baht**	**3,570,913.42**	**Baht**	**357,091.34**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB13 : Stationary Battery and Battery Charger

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB13-1	Vented stationary battery, 58 cells (tubular type) for 125 Vdc system complete with electrolyte and battery rack as per Specification attached (Designed by Contractor). The capacity of stationary battery shall be 1600Ah at least.									
1AB13-1a	a) Battery	2	set	THB	3,229,013.77	6,458,027.54			XXXXX	XXXXX
1AB13-1b	b) Electrolyte	2	set	THB	56,711.35	113,422.70			XXXXX	XXXXX
1AB13-1c	c) Battery Rack	2	set	THB	116,000.50	232,001.00			XXXXX	XXXXX
1AB13-2	125 Vdc battery charger having sufficient rated DC output current, but not less than 15 % of associated battery 8 hour drainage rate, complete with all accessories as per Specification attached, and shall be suitable for use with substation battery Item No. 1AB13-1 (Designed by Contractor)	3					955,623.17	2,866,869.51	XXXXX	XXXXX
1AB13-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB13-1 thru 1AB13-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	967,032.08	967,032.08
Total Price for Schedule 1AB13				**THB**		**6,803,451.24**	**Baht**	**2,866,869.51**	**Baht**	**967,032.08**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB14 : Substation Steel Structure

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB14-1	500 kV take-off structure (B1) as per Dwg. No. ST-1 (Designed by Contractor)	12					1,670,042.00	20,040,504.00	XXXXX	XXXXX
1AB14-2	500 kV beam (B1-2) as per Dwg. No. ST-1 (Designed by Contractor)	10					1,823,900.00	18,239,000.00	XXXXX	XXXXX
1AB14-3	Disconnecting switch operating platform (OP002) as per Dwg. No. ST-OP-0-02	18					11,149.00	200,682.00	XXXXX	XXXXX
1AB14-4	Junction box support structure (JB001) as per Dwg. No. ST-JB-0-01	3					9,811.00	29,433.00	XXXXX	XXXXX
1AB14-5	Junction box support structure (JB003) as per Dwg. No. ST-JB-0-03	6					7,581.00	45,486.00	XXXXX	XXXXX
1AB14-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB14-1 thru 1AB14-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	9,638,776.25	9,638,776.25
Total Price for Schedule 1AB14							**Baht**	**38,555,105.00**	**Baht**	**9,638,776.25**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB15 : Insulator

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

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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
1AB15-1	Suspension insulator fog type (17" minimum leakage distance and 36,000 lb minimum combined M&E strength) as per Specification attached.	Lump sum	Lump sum		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB15-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB15-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	277,662.00	277,662.00
Total Price for Schedule 1AB15							**Baht**		**Baht**	**277,662.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB18 : Low Voltage Cable and Conductor

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB18-1	750 V power cable as per Specification attached	Lump sum	Lump sum				15,314,077.90	15,314,077.90	XXXXX	XXXXX
1AB18-2	600 V control cable with PVC insulation as per Specification attached	Lump sum	Lump sum				49,832,273.70	49,832,273.70	XXXXX	XXXXX
1AB18-3	750 V lighting cable (THW) as per Specification attached	Lump sum	Lump sum				15,400.00	15,400.00	XXXXX	XXXXX
1AB18-4	750 V lighting cable (NYY) as per Specification attached	Lump sum	Lump sum				2,970,990.00	2,970,990.00	XXXXX	XXXXX
1AB18-5	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				20,403,266.40	20,403,266.40	XXXXX	XXXXX
1AB18-6	Aluminum conductor as per Specification attached	Lump sum	Lump sum				850,080.00	850,080.00	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	22,346,522.00	22,346,522.00
Total Price for Schedule 1AB18							**Baht**	**89,386,088.00**	**Baht**	**22,346,522.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB19 : Switchyard Lighting Fixtures

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB19-1	Flood lighting fixture, LED lamp, 10000 lumen, wide-beam, complete with control gear as per Specification attached	20					18,686.80	373,736.00	XXXXX	XXXXX
1AB19-2	Solar lighting fixture for fence and access road, LED, All in one type as per Ratings and Features RF LX01L1 and Dwg. No. LT-FX-0-03	54					13,257.20	715,888.80	XXXXX	XXXXX
1AB19-3	Tapered galvanized steel lamp post H = 4500 mm. complete with anchor bolts as per Dwg. No. ST-LP-0-03 and SD-AB-0-01	54					19,533.82	1,054,826.28	XXXXX	XXXXX
1AB19-4	Cost of Local Transportation, Construction and Installation for Item No. 1AB19-1 thru 1AB19-3	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	536,112.77	536,112.77
Total Price for Schedule 1AB19							**Baht**	**2,144,451.08**	**Baht**	**536,112.77**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB20 : Aluminum Tube, Connector and Miscellaneous Hardware

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

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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
1AB20-1	500 kV Compression connector as per Specification attached	Lump sum	Lump sum	THB	1,233,698.40	1,233,698.40			XXXXX	XXXXX
1AB20-2	500 kV Miscellaneous hardware as per Specification attached	Lump sum	Lump sum	THB	428,947.20	428,947.20			XXXXX	XXXXX
1AB20-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB20-1 thru 1AB20-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	415,661.40	415,661.40
Total Price for Schedule 1AB20				**THB**		**1,662,645.60**	**Baht**		**Baht**	**415,661.40**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB21 : Bus Fitting

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

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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
1AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	5,418,492.20	5,418,492.20			XXXXX	XXXXX
1AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 1AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,354,623.05	1,354,623.05
Total Price for Schedule 1AB21				**THB**		**5,418,492.20**	**Baht**		**Baht**	**1,354,623.05**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB22 : Grounding Material

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB22-1	Ground rod as per Specification attached	Lump sum	Lump sum	THB	339,355.50	339,355.50			XXXXX	XXXXX
1AB22-2	Thermite welding material as per Specification attached	Lump sum	Lump sum				2,270,307.60	2,270,307.60	XXXXX	XXXXX
1AB22-3	Grounding hardware as per Specification attached	Lump sum	Lump sum	THB	1,352,263.00	1,352,263.00			XXXXX	XXXXX
1AB22-4	Disconnecting switch safety Mats as per Specification attached	18		THB	14,716.90	264,904.20			XXXXX	XXXXX
1AB22-5	500 kV maintenance grounding connector and guide, bus connector, earthing and short-circuiting cable as per Specification attached	Lump sum	Lump sum	THB	1,263,165.20	1,263,165.20			XXXXX	XXXXX
1AB22-6	Cost of Local Transportation, Construction and Installation for Item No. 1AB22-1 thru 1AB22-5	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,372,498.88	1,372,498.88
Total Price for Schedule 1AB22				**THB**		**3,219,687.90**	**Baht**	**2,270,307.60**	**Baht**	**1,372,498.88**

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1AB23 : Substation Miscellaneous

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Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB23-1	Rigid steel conduit as per Specification attached	Lump sum	Lump sum				584,694.00	584,694.00	XXXXX	XXXXX
1AB23-2	Fitting for rigid steel conduit as per Specification attached	Lump sum	Lump sum	THB	436,040.00	436,040.00			XXXXX	XXXXX
1AB23-3	HDPE conduit and fitting as per Specification attached	Lump sum	Lump sum				61,250.00	61,250.00	XXXXX	XXXXX
1AB23-4	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				300,000.00	300,000.00	XXXXX	XXXXX
1AB23-5	Cost of Local Transportation, Construction and Installation for Item No. 1AB23-1 thru 1AB23-4	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	345,496.00	345,496.00
Total Price for Schedule 1AB23				**THB**		**436,040.00**	**Baht**	**945,944.00**	**Baht**	**345,496.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-1	500 KV BUS PROTECTION (LOW IMPEDANCE, 8 FEEDERS)	Panel Nos. 1R,2R, 3R, 4R Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7, TP-E-11 SH.1 rev.4 Specification No.1005 See scope of work	4	SET				1,560,363.00	6,241,452.00	XXXXX	XXXXX
1AB24-2	500 kV LINE PROTECTION (87L, 79, 51S)	Panel Nos. 5R, 7R, 12R and 20R (Primary protection) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7, TP-E-11 SH.5 rev.1 Specification No.1005 See scope of work	4	EA				1,885,572.00	7,542,288.00	XXXXX	XXXXX

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1AB24 : Control and Protection System

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-3	500 kV LINE PROTECTION (21P, 79, 51S)	Panel Nos. 9R, 14R, 17R, 22R, 25R and 28R (Primary protection) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7, TP-E-11 SH.5 rev.1 Specification No.1005 See scope of work	6	EA				1,883,261.00	11,299,566.00	XXXXX	XXXXX
1AB24-4	500 kV LINE PROTECTION (21P, 59L, 1-BF)	Panel Nos. 10R, 15R, 21R, and 26R (Secondary protection) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7, TP-E-11 SH.5 rev.1 Specification No.1005 See scope of work	4	EA				1,954,649.00	7,818,596.00	XXXXX	XXXXX

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1AB24 : Control and Protection System

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-5	500 kV LINE PROTECTION (21P, 59L, 2-BF)	Panel Nos. 6R, 8R, 13R, 18R, 23R and 29R (Secondary protection) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7, TP-E-11 SH.5 rev.1 Specification No.1005 See scope of work	6	EA				2,296,038.00	13,776,228.00	XXXXX	XXXXX
1AB24-6	500 kV SHUNT REACTOR PROTECTION	Panel Nos. 11R, 16R, 19R, 24R, 27R and 30R (Reactor protection) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-11 SH.5 rev.1 Specification No.1005 See scope of work	6	EA				1,436,513.00	8,619,078.00	XXXXX	XXXXX

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-7	E1 Converter Panel	Panel No. E1-Conv. -1 set of Multimode Patch Cord Cable and 1 set of Coaxial Cable (RG179) shall be supplied in each E1 Converter. Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.20 Specification No. 1005 See Scope of Work	1	EA				763,576.00	763,576.00	XXXXX	XXXXX
1AB24-8	INTERPOSING PANEL TYPE IP7	Panel Nos. IP1, IP2, IP3 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-6.4 SH.1-6, TP-E-10.2 rev6, TP-E-11 SH.1 rev.4 Specification No. 1005 See scope of work	3	EA				1,057,197.00	3,171,591.00	XXXXX	XXXXX

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-9	TRANSDUCER PANEL	Panel No. TDR1 W&VAR-TDR = 10 V-TDR(1PH) = 12 T-TDR = 2 (500kV GIS &Control Room) DC-TDR = 1 (48 VDC) TS = 10 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.2 rev6, TP-E-11 SH.1 rev.4 Specification No. 1005 See scope of work	1	EA				1,576,851.00	1,576,851.00	XXXXX	XXXXX
1AB24-10	MARSHALLING PANEL FOR TELEPROTECTION (500 kV)	Panel Nos. MP-TELE1, MP-TELE2 and MP-TELE3 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.3 rev13, TP-E-11 SH.2 rev.1 Specification No. 1005 See scope of work	3	EA				423,759.00	1,271,277.00	XXXXX	XXXXX

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1AB24 : Control and Protection System

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	**Supply of Equipment**				**Local Transportation, Construction and Installation** (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-11	MARSHALLING PANEL FOR CONTROL SYSTEM	Panel Nos. MPC1, MPC2 and MPC3 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.3 rev13, TP-E-11 SH.2 rev.1 Specification No. 1005 See scope of work	3	EA				382,041.00	1,146,123.00	XXXXX	XXXXX
1AB24-12	MARSHALLING PANEL FOR RTU	Panel Nos. MP-RTU1, MP-RTU2 and MP-RTU3 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.3 rev13, TP-E-11 SH.2 rev.1 Specification no.1005 See scope of work	3	EA				386,229.00	1,158,687.00	XXXXX	XXXXX

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1AB24 : Control and Protection System

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-13	MARSHALLING PANEL FOR FRS	Panel Nos. MP-FRS1 and MP-FRS2 Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.3 rev13, TP-E-11 SH.2 rev.1 Specification No. 1005 See scope of work	2	EA				394,923.00	789,846.00	XXXXX	XXXXX
1AB24-14	SYNCHRONIZING PANEL FOR 12 BREAKERS OF BREAKER AND A HALF	Panel Nos. S1, S2 Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7 Specification No. 1005 See scope of work	2	EA				574,817.00	1,149,634.00	XXXXX	XXXXX

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-15	500 kV TRIP CIRCUIT SUPERVISION (6-BKR)	Panel Nos.31R, 32R, 33R, 34R Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.1 rev.7 Specification No. 1005 See scope of work	4	EA				826,839.00	3,307,356.00	XXXXX	XXXXX
1AB24-16	GPS RECEIVER PANEL	Panel No. GPS Receiver (Availiable Ports of Ethernet Switch shall not be less than 96 ports) Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.15 rev.2 Specification No.1005 and SD-FOT-P22 See scope of work	1	EA				2,002,356.00	2,002,356.00	XXXXX	XXXXX

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1AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB24-17	Cost of Local Transportation, Construction and Installation for Item No.1AB24-1 thru 1AB24-16		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	7,217,838.15	7,217,838.15
Total Price for Schedule 1AB24								**Baht**	**71,634,505.00**	**Baht**	**7,217,838.15**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB25-1	FAULT RECORDING SYSTEM, 128 ANALOG INPUT, 640 DIGITAL INPUT	Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3, TP-E-10.2 rev.7 Specification No.1003 See scope of work	1	SET				8,205,785.00	8,205,785.00	XXXXX	XXXXX
1AB25-2	Cost of Local Transportation, Construction and Installation for Item No.1AB25-1		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	841,053.95	841,053.95
Total Price for Schedule 1AB25								**Baht**	**8,205,785.00**	**Baht**	**841,053.95**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB30 : Station Service Voltage Transformer

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB30-1	100 kVA, 500000/√3-400/√3 V station service voltage transformer, SF6 filled, outdoor type as per Ratings and Features RF SSVT9311	6			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX
1AB30-2	Steel Supporting Structure for SSVT9311 (Item No. 1AB30-1), H=3.00 m. as per EGAT's Dwg. No. ST-SSVT-0-01, SE-SSVT-9-01 and SD-AB-0-01	6			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX
1AB30-3	Cost of Local Transportation, Construction and Installation for Item No. 1AB30-1 thru 1AB30-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	5,244,000.00	5,244,000.00
Total Price for Schedule 1AB30							**Baht**		**Baht**	**5,244,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB33-1	CCTV System and accessories including:	1	SET				2,632,597.00	2,632,597.00	XXXXX	XXXXX
	(1) Outdoor PTZ Dome Camera (2 EA) (2) Indoor Fixed Camera (8 EA) (3) Outdoor Fixed Camera (12 EA) (4) PC Workstation (1 EA) (5) Server (1 EA) (6) Software license (6.1) Software management license (1 License) (6.2) Recording license (22 Licenses) (6.3) Video analytic license (22 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: 60x80x218.5cm. 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. NPUP-S-01

1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
	(14) PoE Injector for Fixed camera (20 EA) (15) Adapter for PTZ camera (2 EA) (16) CCTV Pole 2 meter (Lumpsum) (17) CCTV Pole 4 meter (Lumpsum) (18) Indoor-type twisted pair cable (Lumpsum) (19) Outdoor-type twisted pair cable (Lumpsum) (20) 12-core ADSS Optical Fiber Cable (Lumpsum) (21) Media Converter (UTP-Fiber Optic) (30 EA) (22) Surge protection-220VAC (8 SET) (23) Line Filter (8 EA) (24) Electrical cable (Lumpsum) (25) EMT couduit (Lumpsum) (26) IMC, Flexible conduit with PVC coating (Lumpsum) (27) E-flex/HDPE (Lumpsum) (28) Ground System (Lumpsum) (29) Accessories (Lumpsum)									
1AB33-2	Cost of Local Transportation, Construction and Installation for Item no. 1AB33-1	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	365,185.00	365,185.00

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1AB33 : CCTV

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
	IMPORTANT : 1. The Bidders are required to propose their estimated quantities for such item together with their bid proposal for EGAT's consideration. 2. Telecommunication Equipment supplied under Schedule 1AB33 shall conform to Specification No. SD-CCTV-P01, Drawing No. DW-COM-D01-007-ALL and DW-CAB-D01-019									
Total Price for Schedule 1AB33							**Baht**	**2,632,597.00**	**Baht**	**365,185.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

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

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1AB34-1	Vented Type Lead-Acid Station Battery 48VDC with capacity not less than 600 Ah (Tubular plate) at 10 Hour rated, 24 Cells, Norminal Voltage 2 Volts/Cell, with Rack 1 set (Den Chai Substation, 500kV Control Building)	1	SET				173,000.00	173,000.00	XXXXX	XXXXX
1AB34-2	Conventional Type Charger 48VDC, 150 A (Den Chai Substation, 500kV Control Building)	2	SET				201,700.00	403,400.00	XXXXX	XXXXX
1AB34-3	48Vdc. Load Center Type1: 60 Breaker (Den Chai Substation, 500kV Control Building)	1	SET				135,700.00	135,700.00	XXXXX	XXXXX
1AB34-4	Local Transportation, Construction and Installation for item 1AB34-1, 1AB34-2 and 1AB34-3	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	136,400.00	136,400.00
Total Price for Schedule 1AB34							**Baht**	**712,100.00**	**Baht**	**136,400.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB35-1	Optical fiber cable from joint box at 500 kV Nan CCT. 1 take-off structure to fiber frame termination cabinet at 500 kV Control Building at Den Chai substation									
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 (1 set) (e) Fiber frame termination cabinet with cable tray (1 set) (f) 36 Pigtails (1.5 meters) (1 set)	1	LOT				117,400.00	117,400.00	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	233,700.00	233,700.00
1AB35-2	Optical fiber cable from joint box at 500 kV Mae moh 3 CCT. 1 take-off structure to fiber frame termination cabinet at 500 kV Control Building at Den Chai substation									

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB35-2.1	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) Fiber frame termination cabinet with cable tray (1 set) (e) 36 Pigtails (1.5 meters) (1 set)	1	LOT				99,900.00	99,900.00	XXXXX	XXXXX
1AB35-2.2	Local transportation, Construction and Installation for item 1AB35-2.1 (Including splicing work and field testing for optical fiber)	1	JOB		XXXXX	XXXXX	XXXXX	XXXXX	238,100.00	238,100.00
1AB35-3	Optical fiber cable from joint box at 500 kV Tha tako CCT. 1 take-off structure to fiber frame termination cabinet at 500 kV Control Building at Den Chai substation									

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB35-3.1	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) Fiber frame termination cabinet with cable tray (1 set) (e) 36 Pigtails (1.5 meters) (1 set)	1	LOT				88,400.00	88,400.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB35 : Communication Cable

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
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	225,100.00	225,100.00
	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.									
Total Price for Schedule 1AB35							**Baht**	**305,700.00**	**Baht**	**696,900.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB38-1	EGAT CCS/ RTU OPERATOR CONSOLE(Complete Set)	Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3 See scope of work	1	SET		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB38-2	EGAT RTU TYPE 621M	Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3 See scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB38-3	EGAT RTU TYPE 621	Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3 See scope of work	1	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB38-4	EGAT RTU TYPE 16D	Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3 See scope of work	2	EA		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB38-5	DESIGN AND INSTALLATION OF APPLICATION SOFTWARE	Installed in Control Building Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3 See scope of work	1	SET		Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	Supplied by EGAT	XXXXX	XXXXX
1AB38-6	Cost of Local Transportation, Construction and Installation for Item No.1AB38-1 thru 1AB38-5		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	1,154,610.90	1,154,610.90
Total Price for Schedule 1AB38								**Baht**		**Baht**	**1,154,610.90**

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MEDIUM COST FOR BID NO. NPUP-S-01

1AB39 : Commissioning

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
1AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	1,280,000.00	1,280,000.00
Total Price for Schedule 1AB39							**Baht**		**Baht**	**1,280,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-1	500 kV Take off structure foundation (TS901) pile type	FD-TS-9-02	12	set	939,395.00	11,272,740.00
1C1-2	500 kV Instrument transformer structure foundation (VT901) pile type	FD-GE-9-02	30	set	53,936.00	1,618,080.00
1C1-3	500 kV Disconnecting switch foundation (DS901) pile type	FD-DS-9-02	18	set	55,927.00	1,006,686.00
1C1-4	500 kV Power circuit breaker foundation (CB901) pile type	FD-CB-9-02	18	set	45,976.00	827,568.00
1C1-5	500 kV Station service voltage transformer structure foundation (GSSVT9-1) pile type	FD-GE-9-02	6	set	53,936.00	323,616.00
1C1-6	500 kV Lightning arrester support structure foundation (LA901) Pile type	FD-GE-9-02	30	set	53,936.00	1,618,080.00
1C1-7	500 kV GIB Air bushing support structure foundation (GBS901) pile type	FD-GBS-9-01	30	set	40,723.00	1,221,690.00

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MEDIUM COST FOR BID NO. NPUP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-8	500 kV GIB-1 support structure foundation (GIB9-1) pile type	Designed by Contractor, TT/KK4-GIB-9-01, See Scope of work	Lump Sum	Lump Sum	199,348.00	199,348.00
1C1-9	500 kV GIB-2 support structure foundation (GIB9-2) pile type	Designed by Contractor, TT/KK4-GIB-9-02, See Scope of work	Lump Sum	Lump Sum	269,780.00	269,780.00
1C1-10	500 kV GIB-3 support structure foundation (GIB9-3) pile type	Designed by Contractor, TT/KK4-GIB-9-03, See Scope of work	Lump Sum	Lump Sum	2,487,294.00	2,487,294.00
1C1-11	500 kV Shunt reactor foundation (SR901) pile type	FD-SR-9-02	6	set	166,812.00	1,000,872.00
1C1-12	500 kV Neutral reactor foundation (NR901) pad type	FD-NR-9-01	6	set	39,682.00	238,092.00
1C1-13	Circuit breaker marshalling kiosk foundation (MK) pad type	Designed by Contractor, ABB/PDG-FD-MK-0-01 , See Scope of work	6	set	8,117.00	48,702.00
1C1-14	Lighting Relay Panel foundation (LRP) pad type	FD-RP-0-02 01/01	1	set	5,642.00	5,642.00

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MEDIUM COST FOR BID NO. NPUP-S-01

1C1 : Foundation Work

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Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C1-15	Lamp post for fence and access road lighting foudation (LP3) (LED type) Pad Type & Pile Type (pad type)	FD-LP-0-05 01/01	54	set	9,646.00	520,884.00
1C1-16	Junction Box Structure foundation (JB001) Pad Type	FD-JB-0-03 01/01	3	set	7,620.00	22,860.00
1C1-17	Junction Box Structure foundation (JB003) Pad Type	FD-JB-0-05 01/01	6	set	6,357.00	38,142.00
1C1-18	Disconnecting Switch Operating Platform foundation (OP002) Pad Type	FD-OP-0-02 01/01	18	set	2,465.00	44,370.00
1C1-19	Isolating Transformer Foundation (IST) Pad Type	FD-TX-0-01 01/01	1	set	20,287.00	20,287.00
1C1-20	30m Telecommunication Tower Foundation(WSA.) pile type	FD-TT-0-08 01/01	1	set	115,562.00	115,562.00
1C1-21	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump Sum	Lump Sum	13,589,207.00	13,589,207.00

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MEDIUM COST FOR BID NO. NPUP-S-01

1C1 : Foundation Work

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
Total Price for Schedule 1C1					**Baht**	**36,489,502.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C2 : Cable Trench

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C2-1	Standard cable trench, steel cover included (Type"A")	SD-CE-0-02 01-02/02	Lump sum	Lump sum	11,938,370.00	11,938,370.00
1C2-2	Standard cable trench, steel cover included (Type"B")	SD-CE-0-02 01-02/02	Lump sum	Lump sum	409,176.00	409,176.00
1C2-3	Hand hole	SD-HH-0-01	8	set	8,686.00	69,488.00
Total Price for Schedule 1C2					**Baht**	**12,417,034.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-1	500kV GIS Building (excluding piling work)	Designed by Contractor, SD-GIS-9-02A 01-24/24, See Dwg. No. DC-C-1, See Scope of work	Lump sum	Lump sum	186,810,624.00	186,810,624.00
1C3-1.1	Ventilation system		Lump sum	Lump sum	Included in 1C3-1	Included in 1C3-1
1C3-2	500kV Control Building (excluding piling work)	SD-CD-0-01A 01-33/33, SD-CD-0-01C 01-14/14, SD-CD-0-01ME 01-02/02, SD-CD-0-01M 01-05/05, SD-CD-0-01SN 01-05/05, SD-CD-0-01L 01-10/10,	Lump sum	Lump sum	35,410,395.00	35,410,395.00
1C3-2.1	Air conditioning system and Ventilation system					
1C3-2.1.1	Minimum 18,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	26,728.97	26,728.97
1C3-2.1.2	Minimum 36,000 BTU split-type air conditioner, including installation fee (Not Higher than the price specified by the Bureau of the Budget www.bb.go.th)		1	set	42,523.36	42,523.36

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MEDIUM COST FOR BID NO. NPUP-S-01

1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C3-2.1.3	Minimum 48,000 BTU split-type air conditioner (Invertor), including installation fee (Not Higher than the price specified by the Bureau of the Budget		22	set	54,672.90	1,202,803.80
1C3-2.1.4	Minimum 60,000 BTU split-type air conditioner (Invertor), including installation fee (Not Higher than the price specified by the Bureau of the Budget		2	set	67,422.62	134,845.24
1C3-2.1.5	Extra work for air conditioning system (additional cooling capacity included)		Lump sum	Lump sum	Included in 1C3-2	Included in 1C3-2
1C3-2.1.6	Ventilation system		Lump sum	Lump sum	Included in 1C3-2	Included in 1C3-2
1C3-2.2	Solar rooftop system	Designed by Contractor, See Scope of work	Lump sum	Lump sum	2,520,000.00	2,520,000.00
1C3-3	Driven Pile (Driven Pile, Dowel bar are included and pile shoe if require)	SD-PL-0-01	Lump sum	Lump sum	16,423,449.00	16,423,449.00
Total Price for Schedule 1C3					**Baht**	**242,571,369.37**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C3 : Building

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount

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MEDIUM COST FOR BID NO. NPUP-S-01

1C4 : Earth Work, Road and Crushed Rock Surfacing

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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. DC-C-1	Lump sum	Lump sum	4,400,000.00	4,400,000.00
1C4-2	RC.Road type " E "	SD-RD-0-01 01-02/02	Lump sum	Lump sum	9,652,500.00	9,652,500.00
1C4-3	Transformer loading	SD-RD-0-03 01/01	Lump sum	Lump sum	679,500.00	679,500.00
Total Price for Schedule 1C4					**Baht**	**14,732,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C5 : Water Supply System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C5-1	Water supply system	Designed by Contractor, See Dwg.DC-C-9, See Scope of work	Lump sum	Lump sum	832,137.00	832,137.00
1C5-2	Laying of water supply : HDPE. pipe (PN10) with valve & fittings	Designed by Contractor, See Dwg.DC-C-9, See Scope of work	Lump sum	Lump sum	165,620.00	165,620.00
1C5-3	Laying of water supply : Galvanized steel pipe (ClassB) with valve & fittings	Designed by Contractor, See Dwg.DC-C-9, See Scope of work	Lump sum	Lump sum	36,990.00	36,990.00
1C5-4	50 cu.m Underground water tank (Pad type)	WD-UT-0-01 01/01	1	set	322,569.00	322,569.00
Total Price for Schedule 1C5					**Baht**	**1,357,316.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C6 : Drainage System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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 Dwg. No. DC-C-6, See Scope of work	Lump sum	Lump sum	18,994,223.50	18,994,223.50
1C6-2	Dia. 0.50 m Black steel pipe (Spiral-Seam) TIS 427-2562 or lastest edition	WD-DN-0-01 01/01	Lump sum	Lump sum	4,695,300.00	4,695,300.00
1C6-3	Dia. 0.15m PVC. Pipe (Class 8.5)	WD-DN-0-01 01/01	Lump sum	Lump sum	39,780.00	39,780.00
1C6-4	Oil separator (Pile type) (with piling work)	SD-OS-0-02 01-03/03, SD-PL-0-01	2	set	1,324,345.00	2,648,690.00
1C6-5	Oil pit with steel grating	WD-DN-0-04 01/01	Lump sum	Lump sum	3,367,782.00	3,367,782.00
1C6-6	Rc. Pump sump (with piling work)	Designed by Contractor, PK3-DN-0-01, SD-PL-0-01, See Scope of work	1	set	1,774,237.00	1,774,237.00
1C6-7	submersible pump for drainage system (with control panel)	Designed by Contractor, PK3-DN-0-01, See Scope of work	Lump sum	Lump sum	6,427,957.00	6,427,957.00

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1C6 : Drainage System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
Total Price for Schedule 1C6					**Baht**	**37,947,969.50**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-1	64 sq.m Site office	See Scope of work	1	set	861,333.00	861,333.00
1C7-2	Test and commissioning for fire protection system in switchyard		Lump Sum	Lump Sum	97,558.00	97,558.00
1C7-3	Test and commissioning for inert gas system (Test in Electrical room)		Lump Sum	Lump Sum	78,731.00	78,731.00
1C7-4	Test and commissioning for foam-water spray system (for Transformer / Shunt reactor)		6	set	42,500.00	255,000.00
1C7-5	Test and commissioning for fire pump system		Lump Sum	Lump Sum	75,841.00	75,841.00
1C7-6	Test and commissioning for GIS Building fire protection system		Lump Sum	Lump Sum	40,000.00	40,000.00
1C7-7	Test and commissioning for package booster pump system		Lump Sum	Lump Sum	845.00	845.00

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MEDIUM COST FOR BID NO. NPUP-S-01

1C7 : Special Construction Works

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C7-8	Fire Protection design work		Lump Sum	Lump Sum	786,467.12	786,467.12
1C7-9	Architectural,Engineering design work and 3D Animation presentation file		Lump Sum	Lump Sum	8,982,676.50	8,982,676.50
1C7-10	Dynamic Pile load test		Lump Sum	Lump Sum	1,510,500.00	1,510,500.00
1C7-11	Static pile load test		2	set	163,698.00	327,396.00
Total Price for Schedule 1C7					**Baht**	**13,016,347.62**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C8 : Miscellaneous

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C8-1	Wire mesh fence and gate (Pad type)	SD-CF-0-01 01-02/02, See Dwg. No. DC-C-1	Lump sum	Lump sum	2,041,080.00	2,041,080.00
1C8-2	Garage (5.50x17.50m)	HS-PS-0-02 01/01	1	set	381,399.00	381,399.00
1C8-3	Switchyard Entrance Gate (sliding gate) pad type	SD-SG-0-02 01/01	1	set	249,063.00	249,063.00
1C8-4	Main entrance gate 8.00m width (sliding) pad type	SD-SG-0-03 01/01	1	set	497,908.00	497,908.00
1C8-5	Sign Board Structure & foundation (with piling work)	SD-SB-0-08 01/01, SD-PL-0-01	1	set	208,332.00	208,332.00
1C8-6	Standard symbol and sign letters of substation	TP655A-MS-A 01/01	1	set	652,789.00	652,789.00
1C8-7	Sub-soil investigation including field and laboratory tests (according to Spec.no.3001)		12	set	27,333.00	327,996.00

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1C8 : Miscellaneous

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	**Local Currency** (excluding VAT) Baht	
					Unit Price	Amount
Total Price for Schedule 1C8					**Baht**	**4,358,567.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-1	Fire Protection System for 500kV Control Building	Designed by Contractor, SD-CD-0-01FP 01/01	Lump Sum	Lump Sum	11,910,500.00	11,910,500.00
1C9-2	Fire Protection System for 500kV GIS Building	Designed by Contractor	Lump Sum	Lump Sum	6,191,034.00	6,191,034.00
1C9-3	Wheel fire extinguisher (2*50 lbs) with cabinet	HS-WR-0-04 01/01	4	set	233,198.00	932,792.00
1C9-4	Fire pump house (with piling work)	SD-FPH-8-01 01-09/09, SD-PL-0-01	1	set	1,291,169.00	1,291,169.00
1C9-5	Foam house (with piling work)	SD-FH-8-01 01-07/07, SD-PL-0-01	2	set	1,204,904.00	2,409,808.00
1C9-6	Water storage tank min. capacity 350 cu.m. (with piling work)	Designed by Contractor, SD-PL-0-01	1	set	2,459,151.00	2,459,151.00
1C9-7	Fire pump system	Designed by Contractor	Lump Sum	Lump Sum	4,757,007.00	4,757,007.00

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1C9 : Fire Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Local Currency (excluding VAT) Baht	
					Unit Price	Amount
1C9-8	Fire Protection System for transformer / shunt reactor	Designed by Contractor	6	set	665,719.00	3,994,314.00
1C9-9	Bladder tank proportioning system and components	Designed by Contractor	2	set	1,097,418.00	2,194,836.00
1C9-10	Fire Protection System for switchyard	Designed by Contractor	Lump Sum	Lump Sum	6,984,019.00	6,984,019.00
1C9-11	Fire Protection environmental monitoring system	Designed by Contractor	Lump Sum	Lump Sum	832,495.00	832,495.00
Total Price for Schedule 1C9					**Baht**	**43,957,125.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

1D7 : Spare Parts for SF6 Gas Insulated Switchgear

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
	Note: detail and breakdown price of each equipment for each item shall be submitted together with tender documents during the bidding									
1D7-1	Gas density meter with two-stage contacts for circuit breaker compartment spare parts for GIS	1	set	THB	35,697.20	35,697.20			XXXXX	XXXXX
1D7-2	Gas density meter for other compartment spare parts for GIS	1	set	THB	64,447.90	64,447.90			XXXXX	XXXXX
1D7-3	Rupture disc of overpressure protection device spare parts for GIS (1 EA for each type/each operating pressure)	1	set	THB	27,857.50	27,857.50			XXXXX	XXXXX
1D7-4	Pump with motor for hydraulic spare parts for GIS (if any)	1	set	THB	60,729.90	60,729.90			XXXXX	XXXXX
1D7-5	Maintenance closing device for circuit breaker	1	set	THB	52,103.70	52,103.70			XXXXX	XXXXX
1D7-6	SF6 gas filling cart accessories for GIS	1	set	THB	231,157.30	231,157.30			XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1D7 : Spare Parts for SF6 Gas Insulated Switchgear

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TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D7-7	Operating Analyzer Fitting Means accessories for GIS (1 EA of Fitting Means/1 set)	3	set	THB	259,675.90	779,027.70			XXXXX	XXXXX
1D7-8	Hand pump for hydraulic accessories for GIS (if any)	1	set	THB	535,414.00	535,414.00			XXXXX	XXXXX
1D7-9	Loose pressure gauge completed with necessary fitting for circuit breaker compartment accessories for GIS (1 gauge/1 set precision pressure gauge spare parts for GIS, can be combined with Gas density meter for CB compartment)	3	set	THB	274,617.20	823,851.60			XXXXX	XXXXX
1D7-10	Cost of Local Transportation for Item No. 1D7-1 thru 1D7-9	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	130,514.34	130,514.34
Total Price for Schedule 1D7				**THB**		**2,610,286.80**	**Baht**		**Baht**	**130,514.34**

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MEDIUM COST FOR BID NO. NPUP-S-01

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

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D12-1	Fuse time lag type 500A	6					10,596.30	63,577.80	XXXXX	XXXXX
1D12-2	Cost of Local Transportation for Item No. 1D12-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,178.89	3,178.89
Total Price for Schedule 1D12							**Baht**	**63,577.80**	**Baht**	**3,178.89**

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MEDIUM COST FOR BID NO. NPUP-S-01

1D22 : Spare Parts for Grounding Material

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D22-1	500 kV grounding tool equipment, portable ground attachment rod and clamp (for three phase connections) as per Specification attached	2	set	THB	955,273.00	1,910,546.00			XXXXX	XXXXX
1D22-2	Cost of Local Transportation for Item No. 1D22-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	95,527.30	95,527.30
Total Price for Schedule 1D22				**THB**		**1,910,546.00**	**Baht**		**Baht**	**95,527.30**

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MEDIUM COST FOR BID NO. NPUP-S-01

1D24 : Spare Parts for Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-1	BUS DIFFERENTIAL RELAY (Low Impedance- Switching Zone)	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				814,428.00	814,428.00	XXXXX	XXXXX
1D24-2	LINE CURRENT DIFFERENTIAL RELAY (87L) 1&3 PH.	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				395,107.00	395,107.00	XXXXX	XXXXX
1D24-3	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply as spare part. (Primary protection:21P). Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				388,730.00	388,730.00	XXXXX	XXXXX
1D24-4	DISTANCE RELAY (21P1) FOR 500 kV without 79/25	Supply as spare part. (Secondary protection:21S). Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				388,730.00	388,730.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1D24 : Spare Parts for Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-5	AUTO RECLOSING AND SYNCHRONISM CHECK RELAY (79+25) 1&3 PH.	Supply as spare part. Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				162,581.00	162,581.00	XXXXX	XXXXX
1D24-6	OVERVOLTAGE RELAY (59N,59C)	Supply as spare part. Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				205,495.00	205,495.00	XXXXX	XXXXX
1D24-7	BREAKER FAILURE RELAY (50BF+62BF) 1&3 PH.	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				153,707.00	153,707.00	XXXXX	XXXXX
1D24-8	REACTOR DIFFERENTIAL RELAY (87R)	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				294,206.00	294,206.00	XXXXX	XXXXX
1D24-9	NEUTRAL REACTOR DIFFERENTIAL RELAY (87RN)	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				294,206.00	294,206.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

1D24 : Spare Parts for Control and Protection System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D24-10	TRANSFORMER OVERCURRENT RELAY (51T/51TG, 51L/51LG,51/51G,51S/51SG,51C/51CG)	Supply as spare part. Input current rating 1A Drawing Nos. DC-E-1, DC-E-2, DC-E-3 SH1-3	1	EA				125,601.00	125,601.00	XXXXX	XXXXX
1D24-11	Cost of Local Transportation for Item Nos.1D24-1 thru 1D24-10		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	20,475.45	20,475.45
Total Price for Schedule 1D24								**Baht**	**3,222,791.00**	**Baht**	**20,475.45**

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MEDIUM COST FOR BID NO. NPUP-S-01

1D25 : Spare Parts for Fault Recording System

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D25-1	ANALOG ISOLATOR CARD	Supply as spare part.	1	EA				85,909.00	85,909.00	XXXXX	XXXXX
1D25-2	POWER SUPPLY	Supply as spare part.	1	EA				35,542.00	35,542.00	XXXXX	XXXXX
1D25-3	ACQUISITION UNIT	Supply as spare part.	1	EA				25,260.00	25,260.00	XXXXX	XXXXX
1D25-4	CPU & MEMORY MODULE 1	Supply as spare part.	1	EA				84,218.00	84,218.00	XXXXX	XXXXX
1D25-5	ANALOG ISOLATOR FOR VOLTAGE	Supply as spare part.	1	EA				84,218.00	84,218.00	XXXXX	XXXXX
1D25-6	ANALOG ISOLATOR FOR CURRENT	Supply as spare part.	1	EA				84,218.00	84,218.00	XXXXX	XXXXX
1D25-7	DIGITAL ISOLATOR MODULE	Supply as spare part.	1	EA				81,906.00	81,906.00	XXXXX	XXXXX
1D25-8	HARD DISK & HARD DISK CONTROLLER	Supply as spare part.	1	EA				75,795.00	75,795.00	XXXXX	XXXXX
1D25-9	TELE- COMMUNICATION BOARD	Supply as spare part.	1	EA				25,260.00	25,260.00	XXXXX	XXXXX
1D25-10	Cost of Local Transportation for Item Nos.1D25-1 thru 1D25-9		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	20,475.45	20,475.45
Total Price for Schedule 1D25								**Baht**	**582,326.00**	**Baht**	**20,475.45**

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MEDIUM COST FOR BID NO. NPUP-S-01

1D30 : Spare Parts for Station Service Voltage Transformer

SUPPLY AND CONSTRUCTION OF 500 KV DEN CHAI SUBSTATION (GIS)
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht		(excluding VAT) Baht	
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
1D30-1	100 kVA, 500000/√3-400/√3 V station service voltage transformer, SF6 filled, outdoor type as per Ratings and Features RF SSVT9311	3			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX
1D30-2	Steel Supporting Structure for SSVT9311 (Item No. 1D30-1), H=3.00 m. as per EGAT's Dwg. No. ST-SSVT-0-01, SE-SSVT-9-01 and SD-AB-0-01	3			supplied by EGAT	supplied by EGAT	supplied by EGAT	supplied by EGAT	XXXXX	XXXXX
1D30-3	Cost of Local Transportation for Item No. 1D30-1 thru 1D30-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	1,311,000.00	1,311,000.00
Total Price for Schedule 1D30							**Baht**		**Baht**	**1,311,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
2AB23-1	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				28,800.00	28,800.00	XXXXX	XXXXX
2AB23-2	Cost of Local Transportation, Construction and Installation for Item No. 2AB23-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	7,920.00	7,920.00
Total Price for Schedule 2AB23							**Baht**	**28,800.00**	**Baht**	**7,920.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-1	LINE CURRENT DIFFERENTIAL RELAY (87L)	Supply as loose part (same model type as supplied in item No. 1AB24-2), to be installed in existing panel Nos. 5R, 16R, 203R and 208R. Specification No. 1005 Drawing Nos. MM3-E-1.1 sh.2-3, MM3-E-2.1 sh.1-2, MM3-E-3.1 sh.1-3 and Scope of Work.	4	Ea				395,107.00	1,580,428.00	XXXXX	XXXXX
2AB24-2	E1 Converter Panel	Panel E1 CONV.-1 and E1 CONV.-2, to be installed in Control building and Relay building No.2. Specification No. 1005 Drawing Nos. MM3-E-1.1 sh.2-3, MM3-E-2.1 sh.1-2, MM3-E-3.1 sh.1-3, TP-E-10.20 and Scope of Work.	2	Ea				445,520.00	891,040.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	**Supply of Equipment**				**Local Transportation, Construction and Installation** (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-3	LOCKOUT RELAY (86, 20 contacts)	Supply as loose part, to be used as 86EF (16NO-4NC with flush-mounted high burden type) in existing panel Nos. 205R and 210R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2 and Scope of Work.	2	Ea				98,385.00	196,770.00	XXXXX	XXXXX
2AB24-4	CUT OFF SWITCH, 20 CONTACTS (PTTCO, 85CO, 43CCS)	Supply as loose part, to be used as 21SGCO in existing panel Nos. 204R and 209R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2, TP-E-9.1 and Scope of Work.	2	Ea				4,357.00	8,714.00	XXXXX	XXXXX

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2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-5	CUT OFF SWITCH, 10 CONTACTS (DTTCO, 87CO, 86ACO, 50/51SCO)	Supply as loose part, to be used as 87CO in existing panel Nos. 5R, 16R, 203R and 208R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2, TP-E-9.1 and Scope of Work.	4	Ea				3,059.00	12,236.00	XXXXX	XXXXX
2AB24-6	CUT OFF SWITCH, 4 CONTACTS (50BFC0, SS, EPS, 43RCC)	Supply as loose part, to be used as 50EFCO in existing panel Nos. 205R and 210R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2, TP-E-9.1 and Scope of Work.	2	Ea				1,906.00	3,812.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-7	INDICATING LAMP (R,G,IL,LG)	Supply as loose part (Red color), to be used as 87LCO-IL, 21SG-IL and 50EFCO-IL in existing panel Nos. 5R, 16R, 203R, 205R, 208R and 210R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2 and Scope of Work.	8	Ea				491.00	3,928.00	XXXXX	XXXXX
2AB24-8	PUSH BUTTON	Supply as loose part (Black color), to be used as 86EF-PB in existing panel Nos. 205R and 210R. Specification No. 1005 Drawing Nos. MM3-E-2.1 sh.1-2 and Scope of Work.	2	Ea				392.00	784.00	XXXXX	XXXXX

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Drawing No. / Reference No.	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
						Foreign Supply		Local Supply			
						CIF Thai Port		Ex-works Price (excluding VAT) Baht			
						Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
2AB24-9	Modified the existing control and protection system	Drawing Nos. MM3-E-1.1 sh.2-3, MM3-E-2.1 sh.1-2, MM3-E-3.1 sh.1-3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	173,400.00	173,400.00
2AB24-10	Cost of Local Transportation, Construction and Installation for Item Nos. 2AB24-1 thru 2AB24-8		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	318,671.00	318,671.00
Total Price for Schedule 2AB24								**Baht**	**2,697,712.00**	**Baht**	**492,071.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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	Modified the existing fault recording system	Drawing Nos. MM3-E-1.1 sh.2-3, MM3-E-2.1 sh.1-2, MM3-E-3.1 sh.1-3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	24,000.00	24,000.00
Total Price for Schedule 2AB25								**Baht**		**Baht**	**24,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
2AB38-1	Modification to the Existing Computerized Control System	Drawing Nos. MM3-E-1.1 sh.2-3, MM3-E-2.1 sh.1-2, MM3-E-3.1 sh.1-3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	52,400.00	52,400.00
Total Price for Schedule 2AB38								**Baht**		**Baht**	**52,400.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

2AB39 : Commissioning

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV MAE MOH 3 SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
2AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	640,000.00	640,000.00
Total Price for Schedule 2AB39							**Baht**		**Baht**	**640,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB18 : Low Voltage Cable and Conductor

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB18-1	Annealed copper ground wire as per Specification attached	Lump sum	Lump sum				32,120.00	32,120.00	XXXXX	XXXXX
3AB18-2	Aluminum conductor as per Specification attached	Lump sum	Lump sum				11,550.00	11,550.00	XXXXX	XXXXX
3AB18-3	Cost of Local Transportation, Construction and Installation for Item No.1AB18-1 thru 1AB18-2	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	12,009.25	12,009.25
Total Price for Schedule 3AB18							**Baht**	**43,670.00**	**Baht**	**12,009.25**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB21 : Bus Fitting

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
3AB21-1	500 kV Bus fitting as per Specification attached	Lump sum	Lump sum	THB	1,460.80	1,460.80			XXXXX	XXXXX
3AB21-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB21-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	401.72	401.72
Total Price for Schedule 3AB21				**THB**		**1,460.80**	**Baht**		**Baht**	**401.72**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB22 : Grounding Material

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB22-1	Thermite welding material as per Specification attached	Lump sum	Lump sum				14,341.80	14,341.80	XXXXX	XXXXX
3AB22-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB22-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	3,944.00	3,944.00
Total Price for Schedule 3AB22							**Baht**	**14,341.80**	**Baht**	**3,944.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB23 : Substation Miscellaneous

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB23-1	Identification and danger notice plate as per drawing attached	Lump sum	Lump sum				28,800.00	28,800.00	XXXXX	XXXXX
3AB23-2	Cost of Local Transportation, Construction and Installation for Item No. 3AB23-1	Lump sum	Lump sum		XXXXX	XXXXX	XXXXX	XXXXX	7,920.00	7,920.00
Total Price for Schedule 3AB23							**Baht**	**28,800.00**	**Baht**	**7,920.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB24 : Control and Protection System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB24-1	CUT OFF SWITCH, 20 CONTACTS (PTTCO, 85CO, 43CCS)	Drawing Nos. TTK-E-1.1, TTK-E-2.2, TTK-E-2.3, TTK-E-3.2, TTK-E-3.3, TP-E-9.1 Scope of Work and Specification No. 1005	4	EA				4,357.00	17,428.00	XXXXX	XXXXX
3AB24-2	Modified the existing control and protection system	Drawing Nos. TTK-E-1.1, TTK-E-2.2, TTK-E-2.3, TTK-E-3.2, TTK-E-3.3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	144,000.00	144,000.00
3AB24-3	Cost of Local Transportation, Construction and Installation for Item No. 3AB24-1		Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	17,171.00	17,171.00
Total Price for Schedule 3AB24								**Baht**	**17,428.00**	**Baht**	**161,171.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB25 : Fault Recording System

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION
TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB25-1	Modified the existing fault recording system	Drawing Nos. TTK-E-1.1, TTK-E-2.2, TTK-E-2.3, TTK-E-3.2, TTK-E-3.3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	29,300.00	29,300.00
Total Price for Schedule 3AB25								**Baht**		**Baht**	**29,300.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB38 : Remote Terminal Unit

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

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
3AB38-1	Modification to the Existing Computerized Control System	Drawing Nos. TTK-E-1.1, TTK-E-2.2, TTK-E-2.3, TTK-E-3.2, TTK-E-3.3 and Scope of Work	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	54,000.00	54,000.00
Total Price for Schedule 3AB38								**Baht**		**Baht**	**54,000.00**

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MEDIUM COST FOR BID NO. NPUP-S-01

3AB39 : Commissioning

SUPPLY AND CONSTRUCTION FOR IMPROVEMENT OF 500 KV THA TAKO SUBSTATION

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

Item No.	Description	Qty.	Unit	Currency	Supply of Equipment				Local Transportation, Construction and Installation (excluding VAT) Baht	
					Foreign Supply		Local Supply			
					CIF Thai Port		Ex-works Price (excluding VAT) Baht			
					Unit Price	Amount	Unit Price	Amount	Unit Price	Amount
3AB39-1	Commissioning	Lump Sum	Lump Sum		XXXXX	XXXXX	XXXXX	XXXXX	640,000.00	640,000.00
Total Price for Schedule 3AB39							**Baht**		**Baht**	**640,000.00**

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Important Information

for

Invitation to Bid No. NPUP-S-01

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

Article A-3. Eligibility of Bidders: General Requirements

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

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

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

Article A-6. Preparation and Delivery of Bids

Details of technical proposal opening time and place shall be specified in the Tentative Schedule.

Article A-7. Availability of Bidding Documents

Availability of Bidding Documents has been changed from CD-ROM to electronic files for download via link provided by EGAT.

Channel of Documents Submission

For channel of document submission in the hereunder Articles, facsimile and telex has been replaced with letters submitted electronically or electronic mails (E-mails).

- B-1. Preparation of Bids

- B-4. Validity of Bids

- D-9. Notices

- E-20. Documents Required for Each Shipment

- F-11. Payment

Section B : Overview of the Procurement Process

The procurement process diagram has been updated**.**

Article B-2. Bid Prices

For Source of Supply and Service 1. Prices for Equipment, Prices for Equipment manufactured outside Thailand (imported Equipment), shall be firm CIF Thai Port basis and quoted in Thai baht, US dollar, euro, Japanese yen, renminbi (Chinese yuan), or in the Bidder's or Manufacturer's home currency only if his currency trading is prevailed at the time of bidding in any international market other than in Bidder's or Manufacturer's home country.

Article B-8. Information to be Submitted with Bid

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

Article E-19. Shipment

The Maritime Promotion Bureau has been updated to the Maritime Promotion Division and its contact information has also been updated.

Article F-11. Payment

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

According to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), the article has been revised as per Data Sheet.

Article G-3. Contractor's Office and Other Construction Facilities

Details of vehicles and relevant conditions to be provided by the Contractor for inspection of the work have been added at the end of this article.

DATA SHEET

for

Invitation to Bid No. NPUP-S-01

(Two-envelope)

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

Article A-3. Eligibility of Bidders: General Requirements

The following requirement shall be added to Article A-3. Eligibility of Bidders: General Requirements, item I.:

j. Bidders shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement together with supporting evidence pursuant to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017).

Article B-3. Bid Security

The amount of bid security shall be USD 3,207,860.- or THB 104,563,500.-.

Article B-4. Validity of Bids

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

Article B-8. Information to be Submitted with Bid

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

s. Bidder's minimum standards of the policy and directions for anti-corruption in relation to procurement, together with the completely filled out Anti-Corruption Compliance Checklist as provided, and supporting evidence.

Where the Bidder holding a certification under ISO 37001 Anti-Bribery Management Systems, certification from the Thai Private Sector Collective Action against Corruption (CAC Certified), or any certification as prescribed by the Anti-Corruption Co-operation Committee, shall be deemed to have satisfied the minimum standards of the policy and directions for anti-corruption in relation to procurement. Such certification documents may be submitted as part of the bid.

Such minimum standards of the policy and directions for anti-corruption in relation to procurement, or the certification, shall remain valid and effective from the technical proposal opening date.

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

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

Maintenance Guarantee Period

- For all Work except 500 kV System

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

Equipment	Period of Guarantee (Year)
- Fault Recording System	2
- Control and Protection System	2

- For 500 kV System

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

Defective Equipment to be replaced with the whole new set

Not Applicable

Article F-11. <u>Payment</u>

The following paragraphs shall be added as the last two paragraphs of this article:

" Please note that the Contractor shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement or a certification of anti-corruption standards that are valid until the date of receipt of the final payment under the Contract.

In the case where EGAT finds that the validity period of the Contractor's submitted minimum standards of the policy and directions for anti-corruption in relation to procurement, or the relevant certification, will expire before the date of receipt of the final payment under the Contract, EGAT shall issue a written notification to the Contractor requiring the submission of a revised or updated, completely filled out Anti-Corruption Compliance Checklist together with supporting evidence, prior to the expiration date of the existing Anti-Corruption Compliance Checklist. "

Article G-3. <u>Contractor's Office and Other Construction Facilities</u>

The provision regarding vehicles for EGAT's inspection under this article shall not be applicable. All other terms and conditions specified in this article shall remain applicable.

Anti-Corruption Compliance Checklist **(Rev.1)**

Bidders shall provide written minimum standards of the policy and directions for anti-corruption in relation to procurement ("Minimum Standards") together with supporting evidence pursuant to the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017). This checklist shall be submitted with Bids.

Project: (Please specify the project for which you are bidding) .....

State Agency: Electricity Generating Authority of Thailand

Bidder Name: (Please specify the bidder's name) .....

Please mark ✓ one of the following boxes ☐ that applies to the bidders* and complete all details in the space provided:

☐ 1. Have one of the following certificates:

- ○ Certificate under ISO 37001 Anti-Bribery Management Systems, or
- ○ Certificate from the Thai Private Sector Collective Action against Corruption, or
- ○ Certificate as prescribed by the Anti-Corruption Co-operation Committee: (Please specify the certificate name)

Validity period: ..... (Please specify the validity period of the chosen certificate) .....

Please attach an evidence of the chosen certificate.

☐ 2. Do not have a certificate as specified in item 1, but have the Minimum Standards with one of the following validity:

- ○ Perpetual Validity, or
- ○ Validity period: ..... (Please specify the validity period of the Minimum Standards) .....

Details of the Minimum Standards and supporting evidence are as follows: (Please mark ✓ in the "Yes" or "No" column):

Item	Yes	No	Reference Evidence (Please specify Article)
1. Bidders have any clearly defined written anti-corruption policies that is regularly updated.			
2. Bidders have any clearly defined written guidelines, methods, or measures for preventing corruption in procurement that is regularly updated, including but not limited to:			
2.1 Code of Conduct			
2.2 Internal unit or personnel explicitly responsible for the prevention of corruption			
2.3 Penalties or regulations against corruption			
2.4 Channels or systems to report any suspicious or queries related to corruption			
2.5 Anti-corruption training plan			
3. Bidders have communicated and publicized the anti-corruption policies and guidelines relation to procurement as stated in items 1 and 2.			
4. Bidders have provided training on anti-corruption to directors, executives, or employees.			
5. The anti-corruption policies and guidelines are reviewed at least every three (3) years.			

We hereby certify that the information provided above and the supporting evidence are true and correct.

Signed .....

(.....)

Name of Bidder

Stamp company seal (if any)

Date.....

* Notes:

1. The certificate or Minimum Standards shall remain valid and effective from the technical proposal opening date until the date of receipt of the final payment under the contract.
2. If the bidders do not have a certificate, the bidders shall fulfill all items stipulated in the above table to meet the Eligibility of Bidders' criteria for participation in this procurement.
3. In case of Consortium of two (2) or more firms, partnership or companies, this checklist of each member shall be submitted separately.
4. In the case of an unincorporated Joint Venture, each participant shall submit this checklist separately.
5. This checklist is a translation from Thai based on the Notification of the Anti-Corruption Co-operation Committee Concerning Minimum Standards of the Policy and Directions for Anti-Corruption in Relation to Procurement Required to be put in place by the Business Operator, in accordance with Section 19 of the Public Procurement and Supplies Administration Act, B.E. 2560 (A.D. 2017), dated September 25, 2024. In the event of any discrepancy, the Thai version in the notification shall prevail.

SECTION A

INVITATION TO BID

ELECTRICITY GENERATING AUTHORITY OF THAILAND

Nonthaburi
Thailand

INVITATION TO BID NO. NPUP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV DEN CHAI SUBSTATION (GIS) AND IMPROVEMENT OF 500 kV MAE MOH 3 AND 500 kV THA TAKO SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE AND UTTARADIT PROVINCES FOR POWER PURCHASE FROM LAO PDR PROJECTS

(TWO-ENVELOPE)

A-1. Invitation

The Electricity Generating Authority of Thailand (EGAT) hereby invites sealed bids for supply and construction of 500 kV Den Chai Substation (GIS) and Improvement of 500 kV Mae Moh 3 and 500 kV Tha Tako Substations under Transmission System Development in the area of Nan Phrae and Uttaradit provinces for Power Purchase from Lao PDR Projects as described herein in accordance with terms, conditions and Specifications described in these Bidding Documents.

A-2. Work Description

The supply and construction of 500 kV Den Chai Substation (GIS) and Improvement of 500 kV Mae Moh 3 and 500 kV Tha Tako Substations will be on a supply and construction basis, the Contractor shall be responsible for complete supply, installation, construction and also engineering design work to the standard specified and best modern practice. The substations to be constructed and the scope of work under this Invitation are described in Section H. Scope of Work.

A-3. Eligibility of Bidders: General Requirements

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

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

b. The Bidder shall be well-established and maintain a permanent place of business.

c. The Bidder shall not be, or supply the Equipment, from the country under the state of Civil War.

d. The Bidder shall be a juristic person who manufactures or provides such material or services, as the case may be, and not be named in the List of Work Abandoners published by the Permanent Secretary, Ministry of Finance and/or in the Debarment List and/or in the List of Work Abandoners declared by EGAT.

e. The Bidder shall not be a Jointly Interested Bidder with other Bidders as from the date of EGAT's issuance of the Invitation to Bid, or shall not be a person who undertakes any action as an "Obstruction of Fair Price Competition" as defined in Additional Regulation for this Invitation.

f. The Bidder shall not either be EGAT's consultant or involving in EGAT's consultancy company under this Invitation, or have EGAT's personnel involved in his business as shareholder having voting right that can control his business, director, manager, officer, employee, agent or consultant except for the ones who are officially ordered by EGAT to act or participate therein.

g. The Bidder shall not be the person who is privileged or protected not to be taken any legal proceeding under Thai Court; provided that such Bidder's government declares that such special privilege is waived.

h. In case of a joint venture or consortium, the Bidder shall carry out all the work under such formation from the time of bidding until the fulfillment of the Contract.

i. The Bidder must have purchased the bidding documents from EGAT. For a joint venture or a consortium, only one (1) member of the joint venture or consortium is required to purchase the bidding documents.

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

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

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

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

A-4. Eligibility of Bidders: Technical Requirements

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

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

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

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

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

b. The Bidder shall have one of the following qualifications regarding experiences executing contract of supply and construction substation.

1) Having experience with EGAT in executing at least one (1) contract as contractor (not as subcontractor) for supply and construction of a complete 500 kV or above conventional or GIS substation, with its overall performance satisfactory to EGAT;

2) Having experience in executing at least three (3) contracts as contractor (not as subcontractor) for supply and construction of a complete 420 kV or above maximum system voltage conventional or GIS substation, with at least three (3) consecutive years of operation. At least one of these three contracts shall be executed and performed in an overseas country (not his own country);

3) For local firm, Having experience with EGAT in executing at least five (5) contracts as contractor (not as subcontractor) for supply and construction of 220 kV or above conventional or GIS substation with at least three (3) consecutive years of operation, with its overall performance satisfactory to EGAT. At least three of these five contracts shall be complete substation;

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

c. Further to b.1) and 2) mentioned above, having an excellent reputation and adequate technical knowledge and practical experience on design, construction, installation and commissioning of at least three (3) 420 kV or above maximum system voltage conventional or GIS complete substation,

with at least three (3) consecutive years of operation. At least one of these three contracts shall be in an overseas country (not his own country). Bidder shall also demonstrate his capacity to perform Work.

Further to b.3) mentioned above, having an excellent reputation and adequate technical knowledge and practical experience on design, construction, installation and commissioning of at least three (3) 220 kV or above EGAT's conventional or GIS substations with at least three (3) consecutive years of operation. Bidder shall also demonstrate his capacity to perform the Work.

Experience record of the Bidder or either member of the joint venture/consortium, including experience record derived from being a member of other joint venture or consortium in previous project(s) is acceptable, provided that there is a letter from the project owner certifying that the Works as described in c. above were performed by the Bidder or either member of the joint venture/consortium of this project. It is not allowed to combine the experience records of each member of the joint venture/consortium in order to meet the experience requirements.

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

d. The Bidder shall propose Equipment manufactured by the qualified manufacturers who shall fulfill the following requirements:

    1. Regularly manufacturing of Equipment of the type and similar ratings proposed.

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

    3. The manufacturer shall have the experience records that meet the requirements set forth herein.

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

    4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item I.d.5 to I.d.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 500 kV Ratings of Gas-Insulated Switchgear (GIS) or Gas-Insulated Bus (GIB). These Equipment shall be manufactured by the qualified manufacturers who shall fulfill the following requirements:

    5.1 Having one of the following qualifications:

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

        OR

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

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

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

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

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

    6.1 Being local manufacturer.

    6.2 Having one of the following qualifications:

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

OR

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

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

a. The Bidder shall have sufficient capacity to carry out the work.

b. The Bidder shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT. In case the Bidder is a joint venture/consortium, either member of the joint venture/consortium shall have no just or proper claims pending against him with respect to breach in the performance of Contract on other similar works awarded by EGAT.

c. The Bidder himself or his subcontractors, at the time of submitting this proposal, shall not carry excessive work nor be in a default position with respect to work with EGAT. Unsatisfactory past performance on Contract awarded by EGAT may be a sufficient reason of being disqualified.

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

1. Regularly manufacturing of Equipment of the type and similar ratings proposed.

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

3. The manufacturer shall have the experience records that meet the requirements set forth herein.

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

4. If the Manufacturer is a new company formed by acquisition of or merger with other companies or business units, and any of such previous companies or business units has the experience records that meet the requirements set forth herein, such experience records are acceptable as the experience records of the new company, provided that each item of the equipment to be supplied under this bid shall be manufactured from the same source of supply as indicated in each of such relevant supply records as described in Item II.d.5 thru II.d.14 below.

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

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

   5.1 Having one of the following qualifications:

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

      OR

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

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

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

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

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

   Having one of the following qualifications:

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

   OR

6.2 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**.**

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

7.1 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.

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

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

7.3 Having one of the following qualifications:

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

OR

7.3.2 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).

8. For Insulator

Having one of the following qualifications:

8.1 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:

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

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

OR

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

9. For Stationary Battery

Having one of the following qualifications:

9.1 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

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

10. For above 33kV through 500 kV Outdoor Type Cable Termination and Cable Termination for GIS.

    Having one of the following qualifications:

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

    OR

    10.2 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.

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

12. For Fault Recording System.

    12.1 Having one of the following qualifications:

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

        OR

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

12.1.2.1 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

12.1.2.2 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.

12.2 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.

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

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

14.1 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.

14.2 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.

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

14.3.1 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

14.3.2 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.

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

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

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

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

Definitions:

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

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

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

A-5. Joint Venture or Consortium

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

A-6. Preparation and Delivery of Bids

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

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

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

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

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

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

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

Envelope I

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

INVITATION TO BID NO. NPUP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV DEN CHAI SUBSTATION (GIS)
AND IMPROVEMENT OF 500 kV MAE MOH 3
AND 500 kV THA TAKO SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE
AND UTTARADIT PROVINCES FOR POWER PURCHASE
FROM LAO PDR PROJECTS

TECHNICAL PROPOSAL

The Envelope for the technical proposal shall contain the following :

a. the completed Proposal Data Forms of the proposed proposal(s)

b. reference documents pertaining to Bidder's qualification and experience under Article A-3. Eligibility of Bidders: General Requirements, A-4. Eligibility of Bidders: Technical Requirements, and Article B-8. Information to be submitted with Bid

c. delivery date guaranteed by Bidders

d. any minor deviations on Technical Specifications

e. any other technical information and drawings the Bidder deems to be adequate to explain his bid

f. Confirmation Form of not being a Jointly Interested Bidder with other Bidders and not being a person who undertakes any actions as an Obstruction of Fair Price Competition, and Registration/Non-registration with the Revenue Department as a VAT registrant

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

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

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

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

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

- Excel files of filled-in Proposal Data.

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

Envelope II

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

INVITATION TO BID NO. NPUP-S-01

SUPPLY AND CONSTRUCTION OF 500 kV DEN CHAI SUBSTATION (GIS)
AND IMPROVEMENT OF 500 kV MAE MOH 3
AND 500 kV THA TAKO SUBSTATIONS

TRANSMISSION SYSTEM DEVELOPMENT IN THE AREA OF NAN PHRAE
AND UTTARADIT PROVINCES FOR POWER PURCHASE
FROM LAO PDR PROJECTS

PRICE PROPOSAL

The Envelope ***II*** for the price proposal shall contain the following :

a. price schedules according to Section C

b. ***Discount Form***

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

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

- Excel files of filled-in Price Schedule

The technical proposal and the price proposal shall be addressed and delivered to ***EGAT*** on or before 10:00 a.m., Bangkok Standard Time, see Tentative Schedule

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

Technical proposals will be opened publicly at ***place and*** time specified ***in Tentative Schedule.***

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

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

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

A-7. Availability of Bidding Documents

The Bidding Documents are available for examination ***and online purchase at http://www4.egat.co.th/fprocurement/biddingeng/*** and can be obtained ***by downloading via link provided by EGAT*** upon payment to EGAT, non-refundable, in the amount of USD …1,000.-…. or Baht …30,000.-….. . These prices include the value added tax.

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

EGAT Accepted Multifunction Relay List

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

NPUP-S-01
Bid No.

เอกสารไม่ควบคุม
รับรองสำเนาโดย หพอ-ร. กสส-ร. อวส.
ก่อนนำไปใช้งาน
ต้องตรวจสอบ Revision ล่าสุด
ฝ่ายวิศวกรรมระบบส่ง กฟผ.
27 ตุลาคม 2568

Oct 2023

EGAT Accepted Multifunction Relay List

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

Bid No. NT
IDUP-S-01

เอกสารไม่ควบคุม
รับรองสำเนาโดย หพอ-ร. กสส-ร. อวส.
ก่อนนำไปใช้งาน
ต้องตรวจสอบ Revision ล่าสุด
ฝ่ายวิศวกรรมระบบส่ง กฟผ.
27 ตุลาคม 2568

Oct 2023

EGAT Accepted Multifunction Relay List

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

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Oct 2023

EGAT Accepted Multifunction Relay List

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

Remarks

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

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

Notes

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

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Oct 2023

EGAT ACCEPTED FAULT RECORDING SYSTEM LIST

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

Remarks

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

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

Notes

1. The procedures for being listed in EGAT ACCEPTED FAULT RECORDING SYSTEM LIST are specified in the EGAT's Pre-Qualification (PQ) process, of which the details can be provided by Transmission System Engineering Division on request.

2. If any types of FRS in the list are planned to discontinue the manufacturing, the manufacturer or the representative is responsible for informing EGAT at least 1 year before the unavailable date.

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EGAT ACCEPTED MANUFACTURER LIST FOR PROTECTIVE RELAY

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

Bid No. NPUP-S-01

Sep 2023

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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. NPUP-S-01

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27 ตุลาคม 2568

EGAT ACCEPTED MANUFACTURER LIST FOR

CONTROL AND PROTECTION PANEL (LOCAL MANUFACTURER)

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

Bid No. NPUP-S-01

Notes

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

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SECTION H

SCOPE OF WORK

SCOPE OF WORK

H-1. General

1. 500 KV DEN CHAI SUBSTATION

GENERAL

DEN CHAI substation is new 500 kV Gas Insulated Substation (GIS) located in Sai Yoi, Den Chai District, Phrae province. The Bid No. NPUP-S-01 comprises 3 schedules. Schedule 1 is for DEN CHAI substation. The detail in this Job No. NPUP-01-S02 are as follows;

Schedule 1: DEN CHAI Substation

The new 500 kV substation shall consist of 500 kV indoor GIS and the bus arrangement shall be Breaker and a half which consists of ten (10) feeders as follows:

- Two (2) feeders for 500 kV lines No.1 and No.2 to NAN substation
- Four (4) feeders for 500 kV lines No.1, No.2, No.3 and No.4 to THA TAKO substation
- Four (4) feeders for 500 kV lines No.1, No.2, No.3 and No.4 to MAE MOH 3 substation

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

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

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

ELECTRICAL PART

Schedule 1: 500kV DEN CHAI Substation

Work included in this Contract.

The Work included in this Contract to be performed by the Contractor shall be as specified in the Contract Documents and as follows:

1. 500 kV Gas Insulated Substation (GIS)

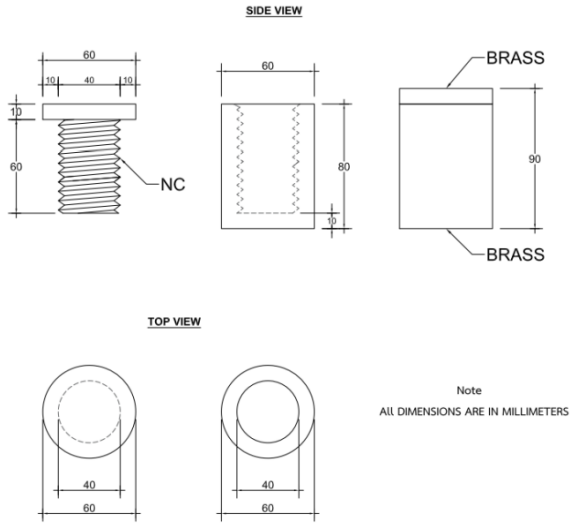
1.1 Design, supply and installation of equipment and miscellaneous hardware required for a complete 500 kV substation with GIS.

1.2 Design, supply and installation of equipment required for a complete 400/230 V power supply system, including all related equipment, raceway for complete operation.

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 The GIB shall not be installed in multiple stacks for the purpose of convenient maintenance.

1.5 The marking pins for referenced positions from the main bus shall be provided in the GIS building. The positions of the marking pins shall be shown on the drawings for future GIS extension, and the quantity shall not be less than 4 sets per each GIS building. The marking pins shall be made of brass or stainless steel that have the formation as follows:



1.6 The detachable walkway (catwalk), removable service platform, and removable ladder for GIS visual protective inspection shall be provided and properly installed on each GIS module. The drawings of these walkways, platforms, and ladders installed with the GIS shall be submitted to EGAT.

EGAT reserves the right to request additional detachable walkways (catwalks), removable service platforms, and removable ladders for GIS visual protective inspection from your provided equipment if deemed necessary. The Contractor shall not consider this as additional cost and time to EGAT.

1.7 The feeder nameplates as well as phasing, device, and switching numbers shown on the GIS module shall be painted or mounted (detachable type) on the enclosure of GIS whichever is appropriate according to the instruction from EGAT installation team. The color of the nameplates shall conform to Dwg. No.SE-ID-8-01. Their sizes and locations shall be appropriate for GIS module. EGAT reserves the right to request more details and clarification if deemed necessary.

1.8 The contractor shall supply identification plates for the both indoor and outdoor substation. The material, size and color shall conform to Dwg. No. Dwg. No.SE-ID-8-01 and SE-ID-0-01, except size of GIS identification plates shall be proposed by the contractor and approved by EGAT. EGAT reserves the right to request more details and clarification if deemed necessary.

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

1.9.1 The connection of 500 kV overhead lines to 55 Mvar, 525 kV Shunt Reactors (SR1A & SR2A) and 110 Mvar and 525 kV Shunt Reactors (SR3A, SR4A)

1.9.2 The connection of 55 Mvar, 525 kV Shunt Reactors (SR1A, SR2A) and 110 Mvar, 525 kV Shunt Reactors (SR3A, SR4A) to their Neutral Reactors SR1B, SR2B, SR3B, SR4B).

1.9.3 The connection of the new 500 kV GIS air bushings to 500 kV overhead lines.

1.9.4 The grounding equipment and miscellaneous hardware for 55 Mvar, 525 kV shunt reactor (SR1A, SR2A), 110 Mvar, 525 kV Shunt Reactor (SR3A, SR4A, SR5A, SR6A) and their Neutral Reactors (SR1B, SR2B, SR3B, SR4B, SR5B, SR6B).

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.

2. Grounding system

2.1 Design, supply and installation of the new ground grid and the grounding system of the following

- 500 kV Substation (including grounding connection for all equipment, facilities, structures within)
- 500 kV GIS building
- Control Building

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

2.3 The ground grid conductors spacing under the building area shall be as same as the switchyard.

2.4 The Contractor shall conduct soil resistivity measurement. Based on the measured soil resistivity, the Contractor shall evaluate/design the ground grid by hand calculation using the equations in IEEE-80 standard, and submit the calculation report to EGAT for Approval. The parameters for the calculation are as follows:

- Fault current division factor (s_f) value = **1**
- Fault current = **50 kA** or recommended by EGAT during Approval

- Fault clearing time (t_f) = **1 second** or recommended by EGAT during Approval
- The grounding conductor spacing for the grounding grid of the 500 kV substations shall be **5 meters.** (D_0)
- The total number of ground rods for the 500 kV substations shall be **400** pieces.

The Contractor shall determine the size of grounding conductors for the substation grounding system and select the number of 4/0 AWG bare copper wires accordingly.

The price of the new ground grid in the new area evaluated based on the given parameters above shall be a price reference when considering the extra work or deducted work.

- If the grounding conductor spacing obtained by hand calculation, i.e. D1 is smaller than D0, the Contractor shall design a grounding grid using the software. The software shall be certified to be acceptable for commercial use.

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

2.6 The Contractor shall perform ground resistance measurement after the completion of grounding system installation. Prior to the measurement, the overhead ground wire shall be disconnected from the substation. The method of measurement shall follow IEEE 81-2012 standard "IEEE Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System" or the latest version. The result shall be submitted to EGAT for Approval.

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

2.8 All fence of the switchyard area shall be grounded. Although some area of the fence is same with the boundary fence or concrete fence, the metal part of that fence shall be also grounded.

3. Lightning protection

3.1 Design, supply and installation of the substation lightning protection system complete with all related equipment. The Contractor shall design the lightning protection system for the protection of all substation equipment which is under the protective zone.

To meet EGAT's design criteria for the lightning protection system and to enhance the stability of lightning protection system, the Basic Insulation Level voltage (BIL) of

- 1550 kV for 500 kV substation

shall be used for the calculation instead of Critical Flashover voltage (CFO).

3.2 The Lightning Protection Level (LPL) of Level 1 shall be used for the design of lightning protection system for the control building, GIS building, and switchgear building.

The overhead ground wire is not permitted for the lightning protection system for the building. Air terminal rods installed at the roof shall be used instead. The Contractor shall also supply and install test boxes as per bidding drawing.

3.3 Lightning protection system shall be designed to meet IEC, IEEE, E.I.T. standards or internationally-accepted standards.

4. Station service system

4.1 Design, supply and installation of the station service system complete with integral accessories to provide the complete system operation. The abnormal condition which occurs from the design and installation of the station service system for example ferroresonance etc. shall be responsible by the contractor. The station service system shall mainly consist of as follows:

- 1x100 kVA (3 Sets), 500,000-400/230 V Station Service Voltage Transformer (SSVT), KVU1A (Supplied by EGAT)
- 1x100 kVA (3 Sets), 500,000-400/230 V Station Service Voltage Transformer (SSVT), KVU2A (Supplied by EGAT)
- Load Center Unit Substation (LCUS)
- 600 V, 500 A safety switches connecting from KVU1A, KVU2A
- 150 kVA, 400-400/230 V isolating transformer for living/facility area.

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

4.3 Design, Supply and installation of isolating transformer.

4.4 Design of station service voltage transformer (KVU1A, KVU2A) for complete installation and operation. Supply, design and installation of miscellaneous hardware for station service systems to complete installation and operation.

4.5 Design, Supply and installation of the stationary battery, in which the battery is capable of delivering power to the control and protection for tripping all circuit breakers, essential load for merging unit and emergency essential load for at least **8 hours** if normal station service fails.

The capacity of the battery shall not be less than **1,600 Ah**. In case of bus faults occurring on the last hour of battery power, the battery shall generate sufficient power for tripping all circuit breakers. The stationary battery shall be designed and calculated in accordance with IEEE or other acceptable international standards. The following factors that influence the capacity of the battery shall be used in the capacity of the battery design:

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

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

5. Telecommunication system

5.1 Design, Supply and installation of the telecommunication tower. The telecommunication tower shall be constructed and divided into appropriate portions which are painted white and orange alternately with the top and bottom portions being painted orange. The obstruction lighting system shall be controlled by automatic flash box (AFB) that gives 30 - 60 flashes per minute. The AFB shall be turned on and turned off by a photo-light switch.

5.2 The lightning protection system for the telecommunication tower shall be calculated and designed by the contractor and the said calculation shall be submitted to EGAT for approval.

6. Facility system

6.1 Outdoor facility system

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

6.1.2 Design, supply and installation of a switchyard lighting system complete with all integral accessories to provide a complete system operation. The lighting system of fence lighting and access road lighting shall be LED (SOLAR panel with built in battery) as per drawing no. LT-FX-0-03-01/01.

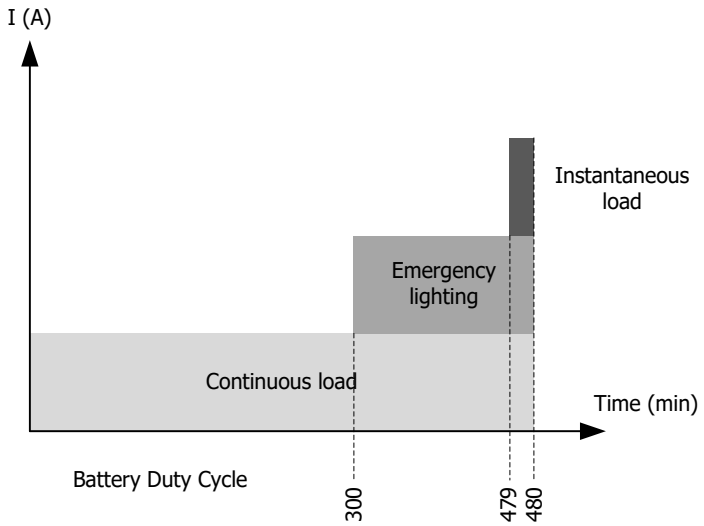
6.1.3 Design, supply and installation of circuits for the main entrance gate, remote control and door phone system of the entrance gate. The control of the entrance gate shall be operated in both manual and remote-control modes which shall be controlled from both the control room and the guardhouse.

6.2 Indoor facility system

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

6.2.2 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.

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



6.2.4 All steel hardware and accessories e.g. lip-channel, conduit, conduit fitting, conduit accessories, boxes and covers shall be hot-dipped galvanized. All listed hardware and accessories shall be submitted to EGAT for approval. In cases where hot-dip galvanization is not available for certain items, clarification and approval must be obtained from EGAT before construction, without incurring additional cost and time.

6.3 The Facility System shall be designed to meet E.I.T. standards. The material of all related equipment shall be also accepted by TIS standards or internationally accepted standards.

6.4 The size of the low-voltage cable shall be adequate to ensure that the voltage drop at the load point remains less than 5% under rated load current.

The voltage drop from the safety switch to the LCUS/AC board, and from the LCUS/AC board to the load, shall not exceed 2% and 3%, respectively.

The voltage drop shall comply with EGAT's requirements, and the voltage drop calculation must be submitted to EGAT for approval.

6.5 Design, supply, and installation of the equipment and hardware required to provide the installation of the GPS antenna and FRS antenna, and their cabling connection (in metallic conduits) to the associated panels in the control room.

6.6 The inverter for essential load shall meet the following requirements. The Contractor shall be responsible for sizing the inverter.

No.	Description	Requirement data	Unit	No.	Description	Requirement data	Unit
1	Environmental Condition			6	Control button		
	1.1 Minimum ambient temperature	0	Celsius		6.1 Inverter START and STOP	YES	
	1.2 Maximum ambient temperature	40	Celsius		6.2 Acknowledge alarm silent	YES	
	1.3 Relative Humidity	0 – 95	%		6.3 Lamp test	YES	
	1.4 Tropicalization	YES	-				
	1.5 Altitude	< 1000	meters	7	Measurement scale 90 degree		
					7.1 AC output voltage class 1.5	YES	
2	Cabinet						
	2.1 Protection Level	IP 20		8	Protection		
	2.2 Mounting	Removable			8.1 Overload shutdown	YES	
	2.3 Epoxy painting color	RAL7032			8.2 Low DC voltage shutdown (< 105 V)	YES	
	2.4 Convection ventilation	Forced air			8.3 AC output fuse to prevent short	YES	
	2.5 Steel sheet thickness	1.5	mm.		circuit current and overload		
					8.4 Overload temperature shut down	YES	
3	Main supply Voltage				8.5 Thermistor fan controlled	YES	
	3.1 Nominal Voltage	125	V.		(Inverter will shut down when		
	3.2 Voltage variation	100 – 150	V.		temperature exceed 70 Celsius)		
	3.3 Permissible ripple voltage on DC	< 5	% Vp-p		8.6 DC circuit breaker	YES	
	3.4 Self-precharge	YES			8.7 AC circuit breaker	YES	
					8.8 DC input fuse to prevent short	YES	
4	Output AC Voltage				circuit current and overload		
	4.1 Nominal voltage	220	V.				
	4.2 Supply system	1 ph+N		9	Monitor		
	4.3 Static voltage regulation at 0-100%	± 2	%		9.1 Input DC voltmeter	YES	
	load variation and power factor 1.0				9.2 Output AC voltmeter	YES	
	4.4 Dynamic voltage regulation	± 5	%				
	- At AC input fluctuation ± 10 %			10	Alarm and LED lamp status Indicator		
	4.5 harmonic distortion	< 5	% THD		10.1 Inverter ON/OFF	YES	
	4.6 Output frequency	50	Hz		10.2 DC input status	YES	
	4.7 Frequency variable	± 0.5	%		10.3 Load on inverter	YES	
	4.8 Synchronized frequency	± 1	% Hz		10.4 LED lamp alarm indicators (Alarm	YES	
					noise shall not less than 75 db)		
5	Output capacity				10.5 AC output status	YES	
	5.1 Output continuous capacity	xx	kVA		(LED shall blink when Under/Over		
	Note xx : Design by Contractor				voltage +/- 10 %)		
	5.2 Overload capacity 100 % continuous	YES					
	5.3 Overload capacity 125 %	10	min	11	Cable entry		
	5.4 Overload capacity 150 %	1	min		11.1 DC incoming	YES	
	5.5 Efficiency at rated load and 1.0	> 85	%		11.2 AC Outgoing	YES	
	power factor				11.3 Terminal	INSIDE	

6.7 The Contractor should refer to Dwg. No. SD-CD-0-01L, SD-CD-0-01M for guideline for facility system design of the control building.

6.8 The Contractor should refer to Dwg. No. SD-GIS-9-02L and SD-GIS-9-02M for guideline for facility system design of the 500 kV GIS building.

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

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

General Requirement

7.1.1 The grid-connected rooftop solar power system shall consist of the following equipment/components but not limited to:

- Photovoltaic modules (PV modules) with grid-connected rooftop solar power support structure
- Grid-connected inverter
- DC combiner box
- AC panel
- DC fuse or DC circuit breaker & AC circuit breaker
- DC & AC surge arrester
- DC & AC cable
- Conduit & Cable tray
- DC & AC connector
- Identification plate
- Monitor equipment
- Tools required for operation and maintenance
- Any other item(s) that may be required to successfully commission, operation and maintain the grid-connected solar PV rooftop system.

7.1.2 All equipment/components parts used in the grid-connected solar PV rooftop system shall conform to the single line diagram and Technical Specifications of systems as shown in Dwg. No. SE-PV-0-01-01/01 & SE-PV-0-02-01/02 – 02/02 or internationally-accepted standards.

7.1.3 Submittals for documents, drawings, catalogs and manuals of equipment, warranty cards and spare parts shall conform to Technical Specifications of systems as shown in Dwg. No. SE-PV-0-02-01/02 – 02/02.

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

7.1.5 The contractor or subcontractor shall have experience in executing at least two (2) contracts as the contractor for design and installation of Solar PV rooftop system in Thailand which has the capacity of PV system more than 60kWp, with successful operation of at least two (2) consecutive years.

7.1.6 Testing and commissioning of the grid-connected solar PV rooftop system shall conform to the internationally-accepted standards.

7.1.7 Mentoring and training to EGAT's operating staff for operation and maintenance.

7.1.8 The insurance period for workmanship and Materials shall conform to Technical Specifications of systems as shown in SE-PV-0-02-01/02 – 02/02.

8. Other works

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

8.2 Supply and installation of miscellaneous hardware required for station post suspension and insulators assembly.

8.3 Modification of Junction box supporting structures (JB003) for the installation of outdoor receptacle box (ORB1 and ORB2).

8.4 Modification of Junction box supporting structures (JB001) for the installation of safety switches from both KVU1A and KVU2A.

8.5 Modification of safety switches for power cable 240 Sq.mm. to connect from SSVT to LCUS as per DWG. No. SE-SSVT-0-01.

8.6 Supply and installation of the labels or signs for indication the low voltage underground cable routes in case of the low voltage cables and communication cables installed by direct burial method or run in conduit method.

Work not included in this Contract.

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

1. Supply and installation of 525 kV Shunt Reactor (SR1A, SR2A, SR3A, SR4A) and their Neutral Reactor (SR1B, SR2B, SR3B, SR4B), except cabling from the control cubicle for Shunt Reactor to the associated equipment and grounding system.
2. Supply of station service voltage transformers (KVU1A, KVU2A) except installation work, cabling work and grounding system.
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 suspension and station post insulators.

CONTROL AND PROTECTION PART

Schedule 1: 500kV DEN CHAI Substation

Work included in this Contract.

1. Design, supply, installation, wiring, test and commissioning of complete control and protection system which comprises at least the following equipment.
   - Swing rack type switchboard panel.
   - Interposing relay panel and transducer panel
   - E1 Converter panel.
   - Marshalling panel for the tele-protection interface
   - Marshalling panel for the control system
   - Marshalling panel for fault recording system
   - Marshalling panel for the remote terminal unit
   - Fault recording system
   - Synchronizing panel
   - Outdoor antenna and GPS receiver panel
   - 400/230 VAC, 125VDC power panel and distribution boards
   - Loose equipment as specified in 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. Design, installation, wiring, test and commissioning of Remote Terminal Units (RTU) and EGAT CCS/ RTU operator console which are supplied by EGAT. whereas configuration that include in this contract shall be fulfilled under EGAT's supervision. Providing completed EGAT RTU I/O List in both hardcopy and electronic file.
3. Installation of the application software database, control function and display for the Computerized Control System whereas the application software is supplied by EGAT. The installation shall be under EGAT's supervision.
4. The Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection systems
5. Design, supply, installation, wiring, test and commissioning of Ethernet Switch. The quantity of supplied shall be enough for the relays that connected to EGAT's operation LAN. Cables and accessories for interfacing are included.
6. Design, supply, installation, wiring, test and commissioning of GPS receiver which is used as a reference time base to all the equipment referred on Drawing No. DC-E-2.
7. The contractor shall provide the draftsman 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), EGAT CCS/ RTU operator console and application software.

COMMUNICATION PART

Schedule 1: 500kV DEN CHAI Substation

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: 500kV DEN CHAI Substation

Work included in this Contract.

ARCHITECTURAL WORK

1. Design and construction of
   - 1.1 500 kV GIS Building.
     - 1.1.1 Architecture of the whole building.
     - 1.1.2 The contractor shall construct the building in accordance with "IEEE STD- 979-1994 (R2004)" (IEEE Guide for Substation Fire Protection).
     - 1.1.3 500 kV GIS Building shall be designed with reference to Dwg.No.SD-GIS-9-02A. The size of the building, equipment layouts and cable block out shall conform to electrical drawing Dwg. No. DC-S-2 and Dwg. No. TYP1A-S-6. Other facilities layouts shall conform to requirements with reference to architectural drawings and scope of work.
     - 1.1.4 The design of building shall analyze and take the following aspects into consideration: Site, Environment, Context, Function, Climate (sunlight, wind, rain, heat etc.), Energy efficiency, Safety and including aesthetic of architecture to encourage EGAT corporate identity.
     - 1.1.5 For exterior surface of the building, there shall be at least 20% of total building area which uses yellow color that represents corporate image of EGAT.
     - 1.1.6 GIB Block out of the building shall be filled with fire stop material-mortar or sealant or foam with 2 hr. fire resistance rate and install in accordance to the manufacturer's instruction.
     - 1.1.7 Building facilities
       - Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
       - Strom water drainage system.
       - Miscellaneous including grounding and labeling.
       - Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
       - Overhead traveling crane, of lifting capacity not less than 10 metric tons and wireless crane remote control. Overhead traveling crane shall have cat-walk for maintenance the equipment on ceiling and complete with guard rail height no less than 90 cm along the cat-walk.
       - Overhead traveling crane shall comply with standard DIN EN 15011 standard.
       - Overhead traveling crane motors shall be dual speed or inverter.
       - Life line shall be installed above along runway rail of overhead traveling crane.
       - Contractor shall provide 2 sets of crane wireless remote controller, one for installation process and another handover to EGAT.
       - Stair shall be easy assets to the cat-walk. Consist of platform with guard rail on the top of stair and staircase.

- Crane safety equipment shall be conformed to the standards.
- Crane testing shall be carried out by the Contractor at his own expense under close supervision of EGAT. The Contractor shall delegate qualified personnel to perform these tests.
    a. Testing after installation: Contractor shall perform testing new overhead traveling crane before operating as the law. The crane testing license shall be valid until completion of crane installation. The crane testing license shall be Certified by a licensed mechanical engineer.
    b. Testing for handover of crane: Contractor shall perform testing used overhead traveling crane as the law. And The crane testing license and new wireless remote controller shall be handed over to EGAT.
    c. Testing for Maintained License: After the handover of crane, contractor shall perform crane testing, inspection and maintenance for 4 times per 2 years, every 6 months to maintain crane testing license as the law at contractor's cost and expense.
- Signboard on building.
- Lightning protection system.
- Emergency lighting system.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).

1.2 3D Animation

1.2.1 3D Animation Requirement

1.2.1.1 A video of walk-through substation 3D animation. The video shall be not less than 3 minutes length, the resolution shall be not less than 4K (3840 x2163 pixels) with a frame rate of 60 fps, have an MP4 H.264 file type. The video shall also show these details.

- Substation's name, in both Thai and English
- A clear view of substation's entrance and signboard
- Normal-eye-view (normal perspective) exterior scenes of the whole substation, including every building and electrical equipment
- Bird 's-eye-view exterior scenes of the whole substation, including every building and electrical equipment
- Normal-eye-view (normal perspective) interior scenes of every building in the substation, such as control room, GIS area, electrical room, relay room, switchgear room, etc.
- Bird 's-eye-view interior scenes of GIS area, and any other rooms

1.2.1.2 All relate 3D files used to create the 3D animation, both in their respective original file types and being exported as SketchUp (SKP) files.

1.2.2 3D Animation Video Specification

1.2.2.1 The contractor shall make use of any software with a software copyright.

1.2.2.2 A music, which is not subjected to copyrights, shall be added into the 3D animation.

1.2.2.3 The contour, landscape and surrounding of the substation in the 3D animation shall also be created, based on the real existing surrounding.

1.2.2.4 A model used to create the 3D animation shall follow these details:

- Any components with a size of 0.008 cubic meters, or more, shall be created as a 3D model
- All models shall be texture-mapped, with a color and texture close to the real surface of the material, equipment, or building they are based on.
- The 3D animation shall make use of the renderings systems along with the ray tracing system to create a realistic light, in accordance to the real sun positioning in Thailand.

2. Construction of

2.1 500 kV Control Building.

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

2.1.2 Building facilities

- Electricity and illumination system including cable work for illumination, ventilation system, power supply, air conditioning system, and telephone system.
- Plumbing system for water supply, building drain and vent, storm water drainage including sanitary wares and fittings.
- Miscellaneous including grounding and labeling.
- Cable routing and cable support (cable tray and cable ladder) installed in cable room and main cable trench.
- Furniture as specified in architectural Drawings.
- Signboard on building and room name sign on each room.
- Lightning protection system.
- Emergency lighting system.
- Warning sign provided in accordance with EIT Standard or Quality and Safety Development Division Standard (EGAT).

WATER SUPPLY AND FIRE PROTECTION SYSTEM

1. Design and construction of

1.1 Fire protection system for 500 kV GIS Building.

1.1.1 GIS Building shall consist of optical beam smoke detector and linear heat detector.

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

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

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

- NFPA 70: National Electrical Code.
- NFPA 72: National Fire Alarm Code.
- NFPA 75: Standard for the Fire Protection of Information Technology Equipment.

- NFPA 76: Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850: Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations

1.2 Fire protection system for 500 kV Control Building.

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

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

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

1.2.4 Detectors shall be cross-zoned detection requiring 2 detectors to be in alarm before discharge. A zone of A or B of addressable smoke detector / heat detector and a zone C of all ASD shall be crossed or two zone of A and B are crossed.

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

- NFPA 2001: Clean Agent Fire Extinguishing Systems.
- NFPA 70 : National Electrical Code.
- NFPA 72 : National Fire Alarm Code.
- NFPA 75 : Standard for the Fire Protection of Information Technology Equipment.
- NFPA76 : Standard for the Fire Protection of Telecommunications Facilities.
- IEEE Std 979: IEEE Guide for Substation Fire Protection
- NFPA 850 : Recommended Practice for Fire Protection for Electric Generating Plants and High Voltage Direct Current Converter Substations.

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

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

1.2.8 For all zones of IG-100 protected zone shall have disconnect switch for maintenance.

1.2.9 Battery room shall be furnished with an all-stainless steel, wall-Mounted emergency eyewash. Contractor shall submit the catalog and proposed location of the eyewash to EGAT for approval.

1.3 Fire protection system for the switchyard to meet the requirement as specified in IEEE Guide for Substation Fire Protection: IEEE Std 979, all requirements of NFPA 850.

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

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

1.4.2 Foam concentrate shall be non-fluorine type.

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

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

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

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

1.4.7 Foam-water spray system provided for Shunt Reactor shall be designed for a density of 10.2 litre/min-sq.m over the exposed surface at the Shunt Reactor.

1.4.8 There shall be one linear heat detector box for each shunt reactor.

1.4.9 Each transformer/shunt reactor shall have disconnect switches for maintenance.

1.5 Fire protection system of warehouse Building shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room together with graphic annunciator in 500 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.

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

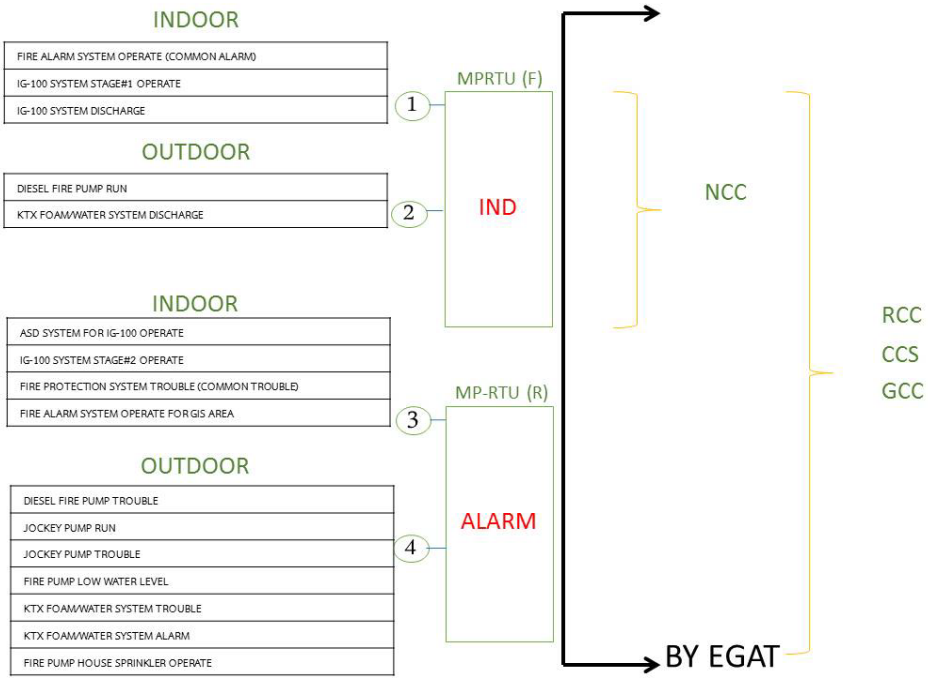
1.7 Minimum 350 cu.m water storage tank, fire pump, and jockey pump shall have trouble and operation visual and audible signals (environmental monitoring), which indicate change of state of any connected devices, shown and recorded at control room together with graphic annunciator in 500 kV Control Building. The installation practice shall be in accordance with the latest edition of NFPA 72.

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

1.9 There shall be one graphic annunciator which displays alarm, discharge and trouble signals of fire alarm system of other buildings, (fire pump houses, transformers, shunt reactors) at the building where control room locates.

1.10 Fire protection system circuits for buildings and switchyards : notification appliance circuits , and signaling line circuits , shall be class A circuit. Initiating device circuits can be class B circuit.

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



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

1.13 Water supply system.

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

1.15 The portable fire extinguishers shall be installed according to the latest NFPA 10.

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

1.17 Contractor shall warranty the fire protection system for two full years starting the date after contract final completion. Fire protection system shall be inspected and maintained for 2 years, not less than 4 times per year and not less than manufacturers' recommendation, at contractor's cost and expense.

1.18 Notwithstanding the expiration of any warranty period described in this contract, the warranty period for any fire protection system or equipment and maintenance period shall be extended by a period equal to the sum of any periods during the warranty period when such system or equipment cannot be used for the purposes for which they were intended or the delays in maintenance, starting from the date EGAT has given contractor notice.

1.19 There shall be a set of computer desk with chair, a set of CPU which suitable for fire protection system software and operate 24 hours a day and a set of 24" LED monitor which show the status of fire protection system in control room in 500 kV Control Building. One set of laser jet printer shall be provided.

1.20 Consumable materials for fire protection system, for example, filters, liquids, and seals shall be provided according to manufacturer's instructions for a period of two years.

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

Protected Area	Detector
1. Control, Relay and Telecommunication Rooms, Thyristor valve room	ASD and SD
2. Under-Raised Floor	ASD and SD
3. Feeder Sections and Switchgear areas	ASD and SD
4. Electrical Room	ASD and SD
5. Battery room	
5.1 Battery room Vented Type	HD
5.2 Battery room Dry Type	HD
6. GIS Area	OBSD
7. Inert Gas Room	SD
8. Other Room such as Shops, Office, Storage room and Pantry	HD or SD
9. Emergency Diesel generator room or Emergency Generator Set House	HD
10. Transformer, Shunt Reactor	LHD
11.Cable 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
13. Warehouse	OBSD

Abbreviations

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

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

1.23 Underground water piping shall have indicator sign.

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

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

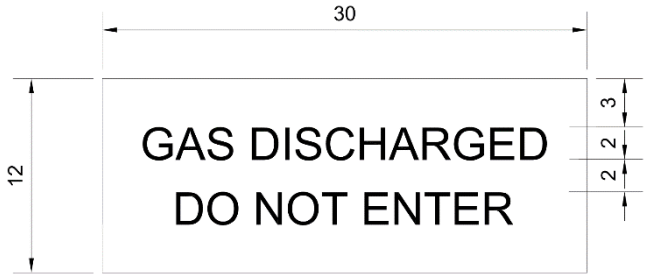
1.26 For all buildings, piping or cable penetrating the wall/floor and block out at wall/floor shall be enclosed with fire stop material. Fire stop material shall be approved by UL Listed/FM Approved and comply with NFPA 80 (Standard for Fire Doors and Other Opening Protectives) and other relevant standards.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

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

1.28 There shall be stainless steel flexible connector for firefighting pipe and foam solution pipe when penetrating through buildings' wall. The flexible joint axial movement shall not less than 5 cm.

1.29 There shall be weather proof type linear heat detector (cable type) system with the approval of UL and/or FM and/or VDS standard for rooftop solar PV system of each building. The system shall send signal of fire alarm to EGAT's RTU and fire protection control panel together with graphic annunciator of each building.

1.30 There shall be a warning sign in front of each exit door of IG-100 protected rooms/zones as the following detail;



The dimensions are in centimeter. The housing shall be Electro-galvanized steel sheet 1mm. thick with epoxy powder coating. The sign shall be made with clear acrylic sheet that evenly diffuse the light throughout the whole sign. There shall be LEDs lamps to illuminate the sign and operated simultaneously with strobe light in front of the room to notify the gas discharge.

1.31 Minimum 350 cu.m. water storage tank shall install water level sight glass or visual water level indicator and galvanized steel guard rail at the top of tank shall be at less 90 cm.

1.32 There shall be insect screen for all louver of fire pump house and foam house.

1.33 The roller shutter door of fire pump house and foam house shall be Rolling Shutter Door with Solid Blades.

1.34 There shall be sunshade for outdoor equipment of deluge system.

2. Construction of
   - 2.1 Foam house.
   - 2.2 Fire pump house.
   - 2.3 Cabinets with 2x50 lbs wheel fire extinguisher.
   - 2.4 Underground water tank 50 cu.m.

CIVIL WORK

1. Design and construction of
   - 1.1 500kV GIS Building
     - 1.1.1 The design of structure & foundation shall be submitted to EGAT for approval.
     - 1.1.2 The main conceptual design of the structure shall consist of:
       - R.C. Structure shall be built from the foundation to GIS floor; and
       - Pre-engineered building (PEB)steel structure (bolts connection system) above the GIS Floor shall be provided with the fire protection to conform with legal provisions.
     - 1.1.3 The roof steel structure shall be applied with a fireproof paint system with a minimum fire-resistant rate of one(1) hour, in accordance with the legal requirement.
     - 1.1.4 The 500 kV GIS Building structure shall be designed with reference to Dwg.No.SD-GIS-9-02A., The equipment layouts and cable block out

shall be in conformity with electrical drawing Dwg.No. DC-S-2 and Dwg.No. TYP1A-S-6

1.1.5 The contractor shall be design and construct the 500kV GIS structure with all applicable requirements pertaining to the building's Electrical, Architectural, Sanitary and Fire protection systems.

1.2 Steel structure and foundations for Specified equipment and the others not shown in "For Construction drawings" and / or EGAT's specification shall conform to Foundation General Layout (C-3).

1.2.1 500kV GIB support structure foundation.

1.2.2 Circuit breaker marshalling kiosk foundations.

1.3 Road and drainage system.

1.4 Drainage system for cable trench.

1.5 Oil containing pit with steel grating and black steel spiral-seam pipes (TIS 427-2531) with protection method according to AWWA C217, C205. (Design sizing for oil drain system only)

1.6 Site office.

2. Construction of

2.1 500kV Control Building.

2.2 Steel structure foundation.

2.3 Equipment support structure foundation with sub trench (if required).

2.4 Telecommunication tower foundation.

2.5 Take-off foundation.

2.6 Transformer loading.

2.7 Cable trench.

2.8 RC. Road.

2.9 Crushed rock surfacing.

2.10 Lamp post for fence and access road lighting LED type foundation.

2.11 Lighting relay panel foundation.

2.12 Isolating transformer foundation.

2.13 Hand hole.

2.14 Oil separator

2.15 Wire mesh fence.

2.16 Main entrance gate 8.00 m width (sliding).

2.17 Switchyard entrance gate (sliding).

2.18 Signboard structure and foundation.

2.19 Garage house.

3. The drawings and calculation of all buildings shall be verified with adequate details for intended application and submitted to EGAT for approval.

4. All design works and the fabrication drawings for all steel structures shall be submitted to EGAT for approval.

5. All design, construction and testing shall be in accordance with Specification No.3001: Civil and Architectural Work.

6. Bored hole for soil investigation shall conform to Specification No. 3001. The position shall be submitted to EGAT for approval.

7. EGAT's Soil Investigation Report (attached to the Contract) which was conducted prior to the site preparation work is a document that can be a reference for design, however; the review of the soil investigation report shall be under responsibility of the Contractor and the warranty of work shall remain following all obligations as specified in the Contract.

8. 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.
9. Dynamic load test (DLT) according to ASTM D4945-latest edition 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.
10. Seismic load test (sonic integrity test) according to ASTM D5882-latest edition shall be applied to all bored piles (if bored pile type is required).
11. Plate bearing test according to ASTM D1194- latest shall be submitted to EGAT for approval (if pad type foundation is required).
12. 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.
13. 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 Contractor shall supply two (2) sets of facilities specified in section G-3, please ensure that each item is provided in double quantity (e.g., six sets of desks and chairs, two refrigerator)

SOLAR ROOFTOP SYSTEM

1. Design and construction of
    1.1 The solar rooftop system for 500kV Control Building
        1.1.1 The materials and equipment for solar rooftop system installation shall meet electrical criteria and standard qualifications in order to safely and properly install the system in buildings by professional installer.
        1.1.2 The Contractor shall design safe access for routine inspection and maintenance and there shall be accessible paths between solar cell arrays for operators to safely and conveniently work.
        1.1.3 The steel structure materials shall be hot dip galvanizing by following ASTM standard.
        1.1.4 The tools of construction shall be both properly assembled and disassembled.
        1.1.5 The equipment or mounting of the PV solar module attached to the construction shall be in proper size and shall be made from stainless steel or corrosion–prevented materials whose grade is not below 304 stainless steel or AL6005-T5 or equivalent.
        1.1.6 The system installation shall provide strong, stable and proper mounting for the roof profile and provide a solid mount that does not penetrate the roof surface.
        1.1.7 The PV module support structure shall be strongly, durably and securely fastened to the roof structure. All structural parts shall be designed for wind resistance not less than the maximum wind speed of tropical storm, and seismic (Earthquake) load requirement according to official declaration of Meteorology Department or regulations relevant to the area, if any.
        1.1.8 Water supply system with cable and conduit for cleaning solar roof top of the building shall have automatic pump with pressure tank and PE water tank at ground floor. The automatic pump with pressure tank shall have sufficient capacity and delivery head. The Contractor shall submit water supply design calculation to EGAT for approval.

Work not included in this Contract.

1. Supply of spare grass and weed killer and accessories. (Specification 3001-4.2.4)

2. 500 KV MAE MOH 3 SUBSTATION

GENERAL

MAE MOH 3 substation is existing 500/230/115/22 kV Air Insulated Substation and 500 kV Gas Insulated Substation located in Mae Moh District, Lampang Province. The Bid No. NPUP-S-01 comprises 3 schedules. Schedule 2 is for MAE MOH 3 substation. The detail in this Job No. NPUP-01-S05 are as follows;

Schedule 2: MAE MOH 3 Substation

1. Sectionalized
   500 kV LINE NO.1 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI
2. Sectionalized
   500 kV LINE NO.2 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI
3. Sectionalized
   500 kV LINE NO.3 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI
4. Sectionalized
   500 kV LINE NO.4 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI

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

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

1) As stated elsewhere in this Bidding Documents, the drawings included in the Bidding Documents except drawing mark "For Construction" are for bidding purposes only and shall not be used for execution of the work.
2) The submitted drawings which are incomplete/unacceptable, or are the bidding document copies with minor modifications shall be returned unmarked to the Contractor.

3) The drawings shall be furnished which provide all details required for thoroughly described equipment as well as installation methods and requirements. However, EGAT retains the right to request additional details if those furnished are perceived inadequate.
4) Calculations, backup data and documentation are required for all parts of the design. The furnished data shall verify completely that design is adequate for application purpose.

ELECTRICAL PART

Schedule 2: MAE MOH 3 Substation

Work included in this Contract.

The Work included in this Contract to be performed by the Contractor shall be as specified in the Contract Documents and as follows:

1. 500 kV Conventional substation

1.1 The contractor shall design, supply, replace and complete the installation of Identification plates. The material, size and color shall conform to Dwg. No. SE-ID-8-01 and SE-ID-0-01. EGAT reserves the right to request more details and clarification if deemed necessary. The 500 kV transmission lines shall be sectionalized and renamed as follows:

1. 500 kV LINE NO.2 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI
2. 500 kV LINE NO.3 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI

2. 500 kV GIS substation

2.1 The contractor shall design, supply, replace and complete the installation of Identification plates. The material, size and color shall conform to Dwg. No. SE-ID-8-01 and SE-ID-0-01, except size of GIS identification plates shall be proposed by the contractor and approved by EGAT. EGAT reserves the right to request more details and clarification if deemed necessary. The complete installation of identification plates are as follows;

1. 500 kV LINE NO.1 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI
2. 500 kV LINE NO.4 FROM MAE MOH 3 – THA TAKO TO MAE MOH 3 – DEN CHAI

Work not included in this Contract.

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CONTROL AND PROTECTION PART

Schedule 2: MAE MOH 3 Substation

Work included in this Contract

1. For 500kV MAE MOH 3 Substation (Control Building and Relay Building No.2)

   1.1 Design, supply, installation, wiring, test and commissioning of complete control and protection system which comprises at least the following equipment.

   - Line Differential Relays (87L) for replacing Existing protective relay in panel nos. 5R, 16R, 203R and 208R.
   - E-1 Converter Panel (E1 CONV.-1 and E1 CONV.-2)
   - Loose equipment as specified in price schedule.
   - Related accessory equipment which is required for interfacing between the equipment in existing control room and the new equipment.
   - Cable and accessories as well as connection of cables among all of the boards, the new equipment, the existing panels and the associated equipment in order to complete the function of the control and protection system in both existing control building and relay building No.2.

   1.2 Design, modification, wiring, test and commissioning osf the existing equipment which comprises at least the following equipment in order to incorporate the new equipment.

   - Modify Existing primary 2 distance relay (21P2) to secondary distance relay (21S) in Panel Nos. 204R and 209R with new related accessory equipment in order to complete the function of distance protection.
   - Modify Existing breaker failure relay (50BF) in Panel Nos. 205R and 210R with new related accessory equipment in order to complete the function of breaker failure protection.
   - Remove existing shunt reactor SR2A, SR2B, SR3A, SR3B, SR8A, SR8B, SR9A and SR9B protection and related accessory equipment in panel 7R, 18R (Control Building), 206R and 211R (Relay Building No.2) and all related panel.
   - The existing panels in Control Room and Relay Building No.2 such as 400/230 VAC and 125 VDC power distribution boards, existing control and protection panels, Transducer panels and marshalling panels. (e.g. for the Remote Terminal Unit, Tele-Protection, Existing Control System, etc.) which related in Scope of Replace Existing primary distance relay (21P1 and 21P) with new primary current differential relay (87LP), Modify existing primary 2 distance relay and breaker failure relay, Rename Line from “500 KV LINE NO.1, 2, 3 and 4 TO THA TAKO” to “500 KV LINE NO. 1, 2, 3 and 4 TO DEN CHAI” and Remove existing shunt reactor SR2A, SR2B, SR3A, SR3B, SR8A, SR8B, SR9A and SR9B protection.

- Cables and accessories as well as connection of cables among all of the boards, primary equipment and the associated equipment in order to complete the function of the control and protection system.

1.3 Rename Line from “500 KV LINE NO.1, 2, 3 and 4 TO THA TAKO” to “500 KV LINE NO. 1, 2, 3 and 4 TO DEN CHAI” and Rename all related Existing Drawing and equipment in Panel Nos. 5R TO 6R, 16R TO 17R (in Control Building), 203R TO 205R, 208 TO 210R (in Relay Building No.2) and all related panel.

1.4 Design, modification of the schematic and wiring diagram of the existing control and protection system, the existing computerized control system (CCS) and the existing fault recording system (FRS) and providing completed EGAT RTU I/O list and FRS I/O list in both hardcopy and electronic file.

1.5 Any modification and interfacing works to the existing panels, including supply of related accessory equipment which is required for incorporating the new equipment. The modified existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.

1.6 Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection systems.

1.7 Removal of the unused existing cables. The removed cable shall be neatly reeled and kept in a suitable place recommended by EGAT.

1.8 Contractor shall provide the draftsman 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

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3. 500 KV THA TAKO SUBSTATION

GENERAL

THA TAKO substation is existing 500/230/115/22 kV Air Insulated Substation located in Hua Thanon, Tha Tako District, Nakhon Sawan Province. The Bid No. NPUP-S-01 comprises 3 schedules. Schedule 3 is for THA TAKO substation. The detail in this Job No. NPUP-01-S06 are as follows;

Schedule 3: THA TAKO Substation

1. Sectionalized
   500 kV LINE NO.1 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
2. Sectionalized
   500 kV LINE NO.2 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
3. Sectionalized
   500 kV LINE NO.3 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
4. Sectionalized
   500 kV LINE NO.4 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI

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

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

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

ELECTRICAL PART

Schedule 3: THA TAKO substation

Work included in this Contract.

The Work included in this Contract to be performed by the Contractor shall be as specified in the Contract Documents and as follows:

1. 500 kV substation

1.1 The contractor shall design, supply, replace and complete the installation of Identification plates. The material, size and color shall conform to Dwg. No. Dwg. No. SE-ID-8-01 and SE-ID-0-01. EGAT reserves the right to request more details and clarification if deemed necessary. The 500 kV transmission lines shall be sectionalized and renamed as follows:

1. 500 kV LINE NO.1 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
2. 500 kV LINE NO.2 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
3. 500 kV LINE NO.3 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI
4. 500 kV LINE NO.4 FROM THA TAKO – MAE MOH 3 TO THA TAKO – DEN CHAI

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

1. The connection of 110 Mvar, 525 kV shunt reactors (SR5A, SR7A) to neutral reactors (SR5B, SR7B).
2. The grounding equipment and miscellaneous hardware for neutral reactors (SR5B, SR7B).

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 Neutral Reactor (SR5B, SR7B), except cabling from the control cubicle for Neutral Reactor to the associated equipment and grounding system.

CONTROL AND PROTECTION PART

Schedule 3: THA TAKO substation

Work included in this Contract

1. For 500kV THA TAKO Substation

1.1 Design, modification, wiring, test and commissioning of the existing equipment comprising at least following topics below in order to complete the functions of the control and protection system which are associated with relocating the transmission line from "500 KV TTK LINE NO.1, 2, 3 and 4 TO MAE MOH 3" to "500 KV TTK LINE NO. 1, 2, 3 and 4 TO DEN CHAI" and replacing of neutral grounding reactor NO. SS1B, SR1B, SS2B, SR2B, SS5B, SR5B, SS7B, SR7B.

- The panel Nos. 508R, 511R (Relay Building No.5), 603R and 613R (Relay Building No.6) and related existing panels in the Relay Building No.5 and Relay Building No.6 such as 400/230 VAC and 125 VDC power distribution boards, control and protection panels, transducer panels and marshalling panels.
- The selector group cut-off switch (21SG) shall be additionally installed in the panel nos. 507R, 510R, 602R and 612R to complete the of function of 21
- Relay settings shall be implemented for all related relays.
- Cables and accessories as well as connection of cables among all of the boards, primary equipment and the associated equipment in order to complete the functions of the control and protection system.

1.2 Design, modification of the schematics and wiring diagrams of the existing control and protection system, the existing computerized control system (CCS) and the existing fault recording system (FRS) which are associated with relocating the transmission line from "500 KV TTK LINE NO.1, 2, 3 and 4 TO MAE MOH 3" to "500 KV TTK LINE NO. 1, 2, 3 and 4 TO DEN CHAI" and replacing of neutral grounding reactor NO. SS1B, SR1B, SS2B, SR2B, SS5B, SR5B, SS7B, SR7B. Including providing completed EGAT RTU I/O list and FRS I/O list in both hardcopy and electronic file.

1.3 Any modification and interfacing work to the existing panels, including supply of related accessory equipment which is required for incorporating the new equipment. The modified existing drawings shall be modified by the Contractor and submitted to EGAT for approval. The final drawings shall be submitted as ACAD files.

1.4 Contractor shall be responsible for providing complete schematic and wiring diagrams of the control and protection systems.

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 Contractor shall provide the draftsman 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

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