#### ELECTRICITY GENERATING AUTHORITY OF THAILAND

# Supplemental Notice No. 2

Invitation to Bid No. TIPE-S-03 and TS12-S-04(R)
Supply and Construction of 500/230/115 kV Bang Lamung 2 Substation (GIS)
and Supply of Control and Protection Equipment for
115 kV Chom Thien Substation

# Transmission System Improvement Project in Eastern Region to Enhance System Security Transmission System Expansion Project No. 12

**Two-Envelope (Pre-Qualification)** 

The attached Supplemental Notice shall be considered as part of the bidding documents No. TIPE-S-03 and TS12-S-04(R).

As acknowledgement of receipt that all additions, deletions and revisions contained in this Supplemental Notice are incorporated into the above bidding documents, Bidder is requested to sign and return this acknowledgement via email address: thana.kir@egat.co.th within three (3) days from the date of the announcement of this Supplemental Notice on http://www4.egat.co.th/fprocurement/biddingeng/.

The original acknowledgement which is manually signed in ink by a person or persons duly authorized shall be included in the proposal to be submitted on the bid opening date.

#### ELECTRICITY GENERATING AUTHORITY OF THAILAND

February 17, 2022

#### <u>ACKNOWLEDGEMENT</u>

This undersigned Bidder hereby certifies that the additions, deletions and revisions set forth in this Supplemental Notice to Invitation to Bid No. TIPE-S-03 and TS12-S-04(R) are incorporated as part of the above bidding documents and will be fully included in any bids which he may submit.

| Signed  |  |
|---------|--|
| Title   |  |
| Company |  |
| Date    |  |

อผค.-อวส. FM-PM06

#### ELECTRICITY GENERATING AUTHORITY OF THAILAND

#### SUPPLEMENTAL NOTICE NO. 2

INVITATION TO BID NO. TIPE-S-03 and TS12-S-04(R)

SUPPLY AND CONSTRUCTION OF 500/230/115 kV BANG LAMUNG 2 SUBSTATION (GIS) AND SUPPLY OF CONTROL AND PROTECTION EQUIPMENT FOR 115 kV CHOM THIEN SUBSTATION

# TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN EASTERN REGION TO ENHANCE SYSTEM SECURITY

TRANSMISSION SYSTEM EXPANSION PROJECT NO.12

The following supplemental information is hereby given for the above described Invitation:

# **Volume I of IV**

Section A: Invitation to Bid

- 1. Replace the following Documents with the revised ones with (Jan. 2022) attached.
  - 1.) EGAT Accepted Bidders List for Supply and Construction of Substations (Jan. 2021)
  - 2.) EGAT Accepted Gas Insulated Switchgear List (GIS) (Jan. 2021)
- 2. Replace EGAT Accepted Main Relay List No.1 (Feb. 2021) with the revised one with (Nov. 2021) attached.
- 3. Replace EGAT Accepted Manufacturer List for Control and Protection Panel (Local Manufacturer) (July 2021) with the revised one with (Dec. 2021) attached.

Bid submitted must be in accordance with this Notice. Receipt of this Notice shall be acknowledged by the Bidder on the proposal included in the Bidding Documents in the space provided on page Part 3 - C21, Article C-5 Supplemental Notices.

| ELECTRICITY GENERATING |
|------------------------|
| AUTHORITY OF THAILAND  |

February 17, 2022

# EGAT Accepted Bidders List for Supply and Construction of Substations

|     | nu (a  | Acceptance for |        |           |  |  |
|-----|--|----------------|--------|-----------|--|--|
| No. | Bidder / Country   | 500 kV         | 230 kV | 115&69 kV |  |  |
| 1   | Hitachi Energy (Thailand) Limited / Thailand   | YES            | YES    | YES       |  |  |
| 2   | Grid Solutions SAS / France  | YES            | YES    | YES       |  |  |
| 3   | Hitachi Ltd. / Japan   | YES            | YES    | YES       |  |  |
| 4   | Hyosung Heavy Industries Corporation / Korea   | YES            | YES    | YES       |  |  |
| 5   | KEC International Limited / India  | YES            | YES    | YES       |  |  |
| 6   | Mitsubishi Corporation / Japan   | YES            | YES    | YES       |  |  |
| 7   | Mitsubishi Electric Corporation / Japan  | YES            | YES    | YES       |  |  |
| 8   | Precise System and Project Co., Ltd. / Thailand  | YES            | YES    | YES       |  |  |
| 9   | SEPCOIII Electric Power Construction Corporation / China   | YES            | YES    | YES       |  |  |
| 10  | Siemens Energy Limited / Thailand  | YES            | YES    | YES       |  |  |
|     | Sri U-Thong Limited / Thailand   | YES            | YES    | YES       |  |  |
| 12  | TEDA Company Limited / Thailand  | YES            | YES    | YES       |  |  |
|     | Joint Venture of Sinohydro and SEPCOIII  | YES            | YES    | YES       |  |  |
| 15  | (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power   |                | TES    | l 125     |  |  |
|     | Construction Corporation / China)  |                |        |           |  |  |
| 14  | Consortium of Grid Solutions (Thailand) Ltd. and Grid Solutions SAS  | YES            | YES    | YES       |  |  |
|     | ( Grid Solutions (Thailand) Ltd. / Thailand and Grid Solutions SAS / France)   |                |        |           |  |  |
| 15  | Consortium of Larsen & Toubro Limited and Sri U-Thong Limited (Larsen & Toubro Limited / India and Sri U-Thong Limited / Thailand)   | YES            | YES    | YES       |  |  |
| 16  | Consortium of Loxley Public Co., Ltd. and Sri U-Thong Limited (Loxley Public Co., Ltd. / Thailand and Sri U-Thong Limited / Thailand)  | YES            | YES    | YES       |  |  |
| 17  | Consortium of Sinohydro and SEPCOIII (Sinohydro (Thailand) Company Limited / Thailand and SEPCOIII Electric Power Construction Corporation / China)  | YES            | YES    | YES       |  |  |
| 18  | SBV Consortium<br>(Sumitomo Corporation / Japan, Black & Veatch (Thailand) Limited / Thailand and Italian-<br>Thai Development / Thailand)   | YES            | YES    | YES       |  |  |
| 19  | The Consortium of Mitsubishi Corporation and DEMCO Public Company Limited (Mitsubishi Corporation / Japan and DEMCO Public Company Limited / Thailand)   | YES            | YES    | YES       |  |  |
| 20  | The Consortium of Precise System and Project Co., Ltd. and Hitachi Ltd. (Precise System and Project Co., Ltd. / Thailand and Hitachi Ltd. / Japan)   | YES            | YES    | YES       |  |  |
| 21  | The Consortium of Mitsubishi Corporation and PWH (Thailand) Company Limited (Mitsubishi Corporation / Japan and PWH (Thailand) Company Limited / Thailand)   | YES            | YES    | YES       |  |  |
| 22  | Consortium of Larsen & Toubro Limited and Mitsubishi Corporation (Larsen & Toubro Limited / India and Mitsubishi Corporation / Japan)  | YES            | YES    | YES       |  |  |
| 23  | Sri U-Thong & LPS CONSORTIUM<br>(Sri U-Thong Limited / Thailand and LOXLEY POWER SYSTEMS COMPANY<br>LIMITED / Thailand)  | YES            | YES    | YES       |  |  |
| 24  | The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Sri U-Thong Limited. (DEMCO Public Company Limited / Thailand, KINDEN Corporation / Japan and Sri U-Thong Limited / Thailand) | YES            | YES    | YES       |  |  |
| 25  | Hyundai Engineering & Construction Co., Ltd. / Korea   |                | YES    | YES       |  |  |
| 26  | Larsen & Toubro Limited / India  |                | YES    | YES       |  |  |
| 27  | Kalpataru Power Transmission Limited / India   |                | YES    | YES       |  |  |
|     | PWH (THAILAND) CO., LTD. / Thailand  |                | YES    | YES       |  |  |
|     | DEMCO Public Company Limited / Thailand  |                | YES    | YES       |  |  |
|     | Italthai Engineering Co., Ltd. / Thailand  |                | YES    | YES       |  |  |

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11 Feb 2022

1/3 Jan 2022

# EGAT Accepted Bidders List for Supply and Construction of Substations

|           | PULL of Country   | Acceptance for |        |           |  |  |
|-----------|---|----------------|--------|-----------|--|--|
| No.       | Bidder / Country  | 500 kV         | 230 kV | 115&69 kV |  |  |
|           | Sieyuan Electric Co., Ltd. / China  |                | YES    | YES       |  |  |
| 200000000 | Black & Veatch (Thailand) Ltd. / Thailand   |                | YES    | YES       |  |  |
| 37        | PESTECH Sdn. Bhd. / Malaysia  |                | YES    | YES       |  |  |
| 34        | Shandong Taikai Power Engineering Co., Ltd. / China   |                | YES    | YES       |  |  |
| 35        | SC-ST-BYP JOINT VENTURE COMPANY LIMITED / Thailand  |                | YES    | YES       |  |  |
| 36        | China CAMC Engineering CO., LTD. / China  |                | YES    | YES       |  |  |
|           | Kinden Corporation - Kinden (Thailand) Co., Ltd. Joint Venture<br>(Kinden Corporation / Japan and Kinden (Thailand) Co., Ltd. / Thailand)   |                | YES    | YES       |  |  |
| 38        | The Joint Venture of SRI and PWH (Sri U-Thong Limited / Thailand) Company Limited / Thailand)   |                | YES    | YES       |  |  |
| 39        | The Consortium of Kinden Corporation and Perfect Engineering Service Public Co., Ltd. (Kinden Corporation / Japan and Perfect Engineering Service Public Co., Ltd. / Thailand)  | S              | YES    | YES       |  |  |
|           | The Consortium of SCL-STC and ITE (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Company Limited / Thailand and Italthai Engineering Co., Ltd. / Thailand)  | 5              | YES    | YES       |  |  |
| 41        | The Consortium of Siemens Energy Limited and Sinkarnchang Company Limited (Siemens Energy Limited / Thailand and Sinkarnchang Company Limited / Thailand)   |                | YES    | YES       |  |  |
| 42        | The Consortium of Siemens Energy Limited and Standard Performance Company Limited (Siemens Energy Limited / Thailand and Standard Performance Company Limited Thailand)   | >              | YES    | YES       |  |  |
| oones:    | JOINT VENTURE OF SCL, STC AND XD (Sinohydro Corporation Limited / China, Sinohydro (Thailand) Co., Ltd. / Thailand and Xian Electric Engineering Co., Ltd. / China)   |                | YES    | YES       |  |  |
| 44        | JOINT VENTURE OF SINOHYDRO CORPORATION LIMITED AND SINOHYDRO (THAILAND) CO., LTD. (Sinohydro Corporation Limited / China and Sinohydro (Thailand) Co., Ltd. / Thailand)   |                | YES    | YES       |  |  |
|           | LOXLEY & LPS CONSORTIUM<br>(LOXLEY PUBLIC COMPANY LIMITED / Thailand and LOXLEY POWER SYSTEMS<br>COMPANY LIMITED / Thailand)  |                | YES    | YES       |  |  |
|           | The consortium of DEMCO Public Company limited and KINDEN Corporation (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan)  |                | YES    | YES       |  |  |
| 75.00     | The Consortium of Shanghai Electric Group Company Limited & Future Electrical Control Company Limited (Shanghai Electric Group Company Limited / China and Future Electrical Control Company Limited / Thailand)  |                | YES    | YES       |  |  |
|           | Consortium of ITE - NCPE<br>(Italthai Engineering Co., Ltd./ Thailand and North China Power Engineering Co., Ltd. of<br>China Power Engineering Consulting Group / China)   |                | YES    | YES       |  |  |
|           | The Consortium of DEMCO Public Company Limited, KINDEN Corporation and Hyundai Electric & Energy Systems Company Limited (DEMCO Public Company Limited / Thailand and KINDEN Corporation / Japan and Hyundai Electric & Energy Systems Company Limited / Korea) |                | YES    | YES       |  |  |
| 50        | Grid Solutions (Thailand) Limited / Thailand  |                | YES    | YES       |  |  |
| 51        | CGGC-PG Joint Venture / China   |                | YES    | YES       |  |  |
|           | Consortium of Pinggao Group Co., Ltd. and Italthai Engineering Co., Ltd. (Pinggao Group Co., Ltd. / China and Italthai Engineering Co., Ltd. / Thailand)  |                | YES    | YES       |  |  |
| 53        | Hyundai Heavy Industries Co., Ltd. / Korea  |                | 7.     | YES       |  |  |



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11 Feb 2022

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2/3 Jan 2022

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

| Nie | P:ddon/County  | Acceptance for |        |           |  |  |  |
|-----|--|----------------|--------|-----------|--|--|--|
| No. | Bidder / Country   | 500 kV         | 230 kV | 115&69 kV |  |  |  |
| 54  | LOXLEY POWER SYSTEMS COMPANY LIMITED / Thailand  |                |        | YES       |  |  |  |
| 55  | Future Electrical Control Company Limited / Thailand   |                |        | YES       |  |  |  |
| 56  | NARI Group Corporation / China   |                |        | YES       |  |  |  |
|     | Consortium ITE and HHI<br>(Italthai Engineering Co., Ltd. / Thailand and Hyundai Heavy Industries Company Limited<br>/ Korea)  |                |        | YES       |  |  |  |
|     | The Consortium of Demco Public Co., Ltd. Perfect Engineering Service Public Co., Ltd. And Demco Power Co., Ltd.  (Demco Public Company Limited / Thailand, Perfect Engineering Service Public Co., Ltd. / Thailand and Demco Power Co., Ltd. / Thailand) |                |        | YES       |  |  |  |
|     | The Consortium of A2 Technologies Vietnam Co., Ltd. and A2 Technologies Co., Ltd. (Thailand) (A2 Technologies Vietnam Co., Ltd. / Vietnam and A2 Technologies Co., Ltd. (Thailand) / Thailand  | dillo          | 00%    | YES       |  |  |  |

#### Note

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

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11 Feb 202

3/3 Jan 2022

#### EGAT Accepted Gas Insulated Switchgear List

|   |   |            | Equipr | nent Rat | ina      |          | Type of N | lechanism        |  | eferenced GIS Component                                      |  |
|---|---|------------|--------|----------|----------|----------|-----------|------------------|--|--|--|
| Description                                       | Manufacturer / Country  | Type/Model | 1000   |          | - 20     |          | 2000      |                  | CT   | VT   | Bushing (Porcelain)  |
|   |   |            | kV     | A        | kA       | Spring   | Hydraulic | Hydraulic-Spring | Manufacturer / Country   | Manufacturer / Country                                       | Manufacturer / Country                                       |
|   | ABB Power Grids<br>Switzerland Ltd. / Switzerland                           | ELK-3      | 550    | 4000     | 63       |          |           | ~                | Pfiffner/Switzerland   | Trench/Germany<br>Ritz/Germany<br>Pfiffner/Switzerland       | LAPP/Germany<br>XD/China                                     |
|   | Siemens AG / Germany  | 8DQ1P2     | 550    | 4000     | 50       | 1        |           |                  | Trench/Germany   | Trench/Germany   | HSP/Germany  |
|   | GE Grid Solutions / France  | T155       | 550    | 4000     | 50       | 1        |           |                  | Pfiffner/Switzerland<br>ENPAY/Turkey                             | GE/France<br>Ritz/Germany                                    | PPC/Austria<br>Ceralep/France                                |
| 550 kV, 4000 A, 50 kA GIS                         | Hitachi Ltd. / Japan  | IFT        | 550    | 6300     | 63       |          | <b>~</b>  |                  | Hitachi/Japan<br>Meiden Chemical/Japan                           | Nissin/Japan<br>Toko/Japan                                   | N.G.K./Japan   |
|   | Hyundai Heavy Industries<br>Co., Ltd. / Korea                               | 550SR      | 550    | 4000     | 63       |          | >         |                  | Daeyoung/Korea<br>Hyundai/Korea                                  | Nissin/Japan<br>TOKO/Japan<br>Trench/Germany                 | PPC/Germany<br>PPC/Sweden<br>TYCO/Switzerland<br>N.G.K/Japan |
|   | Mitsubishi Electric<br>Corporation / Japan                                  | 500-GPS    | 550    | 4000     | 50       | 1        |           |                  | Melco Japan  | Melco/Japan  | N.G.K./Japan   |
|   | New Northeast Electric<br>Group High Voltage<br>Switchgear Co., Ltd./ China | ZF15-550   | 550    | 4000     | 63       |          | <b>~</b>  | /                | Liaoning Xinming Instrument<br>Transformer Co.,Ltd./China        | Liaoning Xinming<br>Instrument Transformer<br>Co.,Ltd./China | Liling Huaxin Insulator<br>Technology Cp.,Ltd./China         |
|   | ABB Power Grids<br>Switzerland Ltd. / Switzerland                           | ELK-14     | 245    | 4000     | 63<br>50 |          |           |                  | Pfiffner/Switzerland<br>ABB/Czech                                | Pfiffner/Switzerland<br>Trench/Germany                       | LAPP/Germany<br>XD/China                                     |
|   | GE Grid Solutions / France  | B105       | 245    | 4000     | 50       | 1        |           |                  | ENPAY/Turkey<br>ALCE/Turkey<br>GE/France                         | GE/France  | PPC Insulators/Austria<br>Ceralep/France<br>GE/France        |
|   | Hyosung Corporation / Korea   | HSG-305B   | 300    | 4000     | 50       | ~        | " (L      | 10               | Hyosung/Korea  | Nissin/Japan<br>Toko/Japan                                   | LAPP/Germany   |
| 245 kV, 4000 A, 50 kA GIS                         | Xian XD Switchgear Electric<br>Co., Ltd./ China                             | ZF9-252    | 245    | 4000     | 50       |          | )         |                  | XD/China<br>Nanjing Zhida Electric/China                         | XD/China   | XD/China   |
|   | New Northeast Electric<br>Group High Voltage<br>Switchgear Co., Ltd./ China | ZFW20-252  | 245    | 4000     | 50       | ),       |           |                  | Liaoning Xinming Instrument<br>Transformer Co.,Ltd./China        | Liaoning Xinming<br>Instrument Transformer<br>Co.,Ltd./China | Liling Huaxin Insulator<br>Technology Cp.,Ltd./China         |
|   | GE High Voltage<br>Switchgear (Suzhou) Co.,<br>Ltd / China                  | B105       | 245    | 4000     | 50       | <b>√</b> |           |                  | Nanjimg Zhida / China  | Suzhou TOKO / China  | Liling Huaxin Insulator<br>Technology<br>Cp.,Ltd./China      |
|   | ABB High Voltage<br>Switchgear (Xiamen) Co.,<br>Ltd. / China                | ELK-04     | 145    | 3150     | 40       |          |           | ✓                | Pfiffner/Switzerland<br>Sihui/China<br>ABB Jingke / China        | Pfiffner/Switzerland<br>Sieyuan/China<br>ABB Jingke / China  | XD/China   |
|   | Hyundai Heavy Industries<br>Co., Ltd. / Korea                               | 145SP-1    | 123    | 3150     | 40       | ✓        |           |                  | Dongwoo/Korea  | Nissin/Japan   | LAPP/Germany   |
|   | Hyosung Corporation / Korea   | HSG-144D   | 145    | 3150     | 40       | ✓        |           |                  | Hyosung / Korea  | Nissin/Japan   | LAPP/Germany   |
| 123 kV, 3150/2000 A, 40 kA GIS<br>Main bus 3150 A | New Northeast Electric<br>Group High Voltage<br>Switchgear Co., Ltd./ China | ZFW20-145  | 145    | 3150     | 40       | <b>Y</b> |           |                  | Liaoning Xinming Instrument<br>Transformer Co.,Ltd./China        | Liaoning Xinming<br>Instrument Transformer<br>Co.,Ltd./China | Liling Huaxin Insulator<br>Technology Cp.,Ltd./China         |
| Feeder 2000 A                                     | ILJIN Electric Co., Ltd. /<br>Korea   | IJS 1440   | 145    | 3150     | 40       | <b>~</b> |           |                  | Samnung / Korea  | Toko Takaoka Korea /<br>Korea                                | Lapp / Romania   |
| 8   | TOSHIBA Energy Systems<br>& Solutions Corporation/<br>Japan                 | G3A-b      | 145    | 3150     | 40       | *        |           |                  | TOSHIBA / Japan  | TOSHIBA / Japan  | TOSHIBA / Japan  |
|   | Shanghai Sieyuan High<br>Voltage Switchgear Co.,<br>Ltd. / China            | ZF28A-145  | 145    | 3150     | 40       | <b>√</b> |           |                  | Shanghai Sieyuan High<br>Voltage Switchgear Co., Ltd. /<br>China | Jiangsu Sieyuan Hertz<br>Co.,Ltd. / China                    | XD/China   |



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11 Feb 2022

J.

1/1 Jan 2022

| Description          | Manufacturer       | Accepted Type     | Accep  | Accepted Voltage Level |           | Notes  | ]  |
|----------------------|--------------------|-------------------|--------|------------------------|-----------|--|--|
|                      |                    | ,                 | 500 kV | 230 kV                 | 115&69 kV |  |  |
| Current Differential | ABB                | RED670 (*)        | ✓      | ✓                      | ✓         |  |  |
| Protection           | GE                 | P543 (*)          | ✓      | ✓                      | ✓         | 101  |  |
|                      |                    | L90 (*)           | ✓      | ✓                      | ✓         |  |  |
|                      | SEL                | SEL-311L (***)    | ✓      | ✓                      | ✓         | 2,0  |  |
|                      |                    | SEL-411L (*)      | ✓      | ✓                      | ✓         | 0/2  |  |
|                      | Siemens            | 7SD52 (***)       | ✓      | ✓                      | <b>V</b>  |  |  |
|                      | Schneider Electric | P543 (**)         | ✓      | ✓                      |           | >  |  |
|                      | Ingeteam           | EF-LD (*)         | ✓      | ✓                      | 11        |  |  |
|                      | NR Electric        | PCS-931 (**)      | ✓      | <b>/</b>               | ~         |  |  |
| Distance Protection  | ABB                | REL670 (*)        | ✓      |                        |           |  |  |
|                      | GE                 | P443 (***)        | ✓      |                        | ✓         |  |  |
|                      |                    | D30 (*)           | 3      | O'                     | <b>✓</b>  | Only for three-pole tripping and line protection without carrier scheme. |  |
|                      |                    | D60 (*)           | 70"    | ✓                      | ✓         |  | •  |
|                      |                    | ALPSDA1           | ) 🗸    | ✓                      | ✓         |  | ·  |
|                      | SEL                | SEL-311C (***)    |        |                        | <b>√</b>  | Only for three-pole tripping and line protection without carrier scheme. |  |
|                      |                    | SEL-421 (*)       | ✓      | ✓                      | ✓         | Lood   | 5001001                                      |
|                      |                    | SEL-411L (*)      | ✓      | ✓                      | ✓         |  | 15ควบคุม<br>พพอ-ส. กสส-ส. อวส.               |
|                      | Siemens            | 7SA522 (***)      | ✓      | ✓                      | ✓         | ก่อง<br><b>ต้องต</b> รวจส  | นำไปใช้งาน                                   |
|                      |                    | 7SA6 series (***) | ✓      | ✓                      | ✓         |  | บบ Revision <b>ล่าสุด</b><br>ธรมระบบส่ง กฟม. |
|                      | 2:0                | 7SA87 (*)         | ✓      | ✓                      | ✓         |  | 11 Feb 202                                   |
|                      | Schneider Electric | P443 (**)         | ✓      | ✓                      | ✓         |  | 0  |
|                      | Ingeteam           | EF-ZT (*)         | ✓      | ✓                      | ✓         |  | di   |
|                      | NR Electric        | PCS-902 (*)       | ✓      | ✓                      | ✓         |  |  |

Page 1 of 4 Nov 2021

| Description             | Manufacturer Accepted Type Accepted Voltage Level |               | Notes    |          |           |              |
|-------------------------|---|---------------|----------|----------|-----------|--------------|
|                         |   |               | 500 kV   | 230 kV   | 115&69 kV |              |
| Distance Protection     | Toshiba   | GRZ200 (***)  |          | ✓        | ✓         |              |
|                         | ZIV   | ZLV (***)     |          | ✓        | ✓         | 10           |
| Transformer             | ABB   | RET670 (*)    | ✓        | ✓        | ✓         |              |
| Differential Protection |   | RET650 (*)    | ✓        | ✓        |           | 3-restraints |
|                         | GE  | P64x (*)      | ✓        | <b>✓</b> | ✓         |              |
|                         |   | T35 (*)       |          | ✓        | ✓         |              |
|                         |   | T60 (*)       |          | ✓        | <b>✓</b>  |              |
|                         | SEL   | SEL-387       |          | ✓        | ~         | 4-restraints |
|                         |   | SEL-487E (*)  | ✓        | <b>✓</b> | (7)       |              |
|                         |   | SEL-587       |          | 1        | ~         | 2-restraints |
|                         |   | SEL-787 (***) |          |          | <b>/</b>  | 4-restraints |
|                         | Siemens   | Duobias (***) |          |          | ✓         |              |
|                         |   | 7UT6 (***)    | <b>1</b> | . O.     |           | 5-restraints |
|                         |   | 7UT82 (*)     | (CX)     | ✓        | ✓         | 2-restraints |
|                         |   | 7UT86 (*)     |          | ✓        | ✓         | 3-restraints |
|                         | Schneider Electric                                | P645 (**)     | <b>→</b> | ✓        | ✓         |              |
|                         | Ingeteam  | EF-TD (*)     | <b>✓</b> | ✓        |           | 3-restraints |
|                         | NR Electric                                       | PCS-978 (*)   | ✓        | ✓        | ✓         |              |
|                         | Toshiba   | GRT200 (***)  | ✓        | ✓        | ✓         |              |
|                         | ZIV   | IDV (***)     | ✓        | ✓        | ✓         |              |
|                         | Mitsubishi  | MRD-HA (***)  |          |          | ✓         | 3-restraints |
| High Impedance          | ABB   | REB650 (*)    | ✓        | ✓        | ✓         |              |
| Busbar Protection       | SEL   | SEL-587Z      | ✓        | ✓        | ✓         |              |
|                         | Toshiba   | GRB150        | ✓        | ✓        | ✓         |              |

เอกสารควบคุม

รับรองสำนนาโดย <u>พพอ-ส. กลส-ส. อวส.</u> ก่อนนำใปใช้งาน ต้องตรวงสอบ Revision ล่าสุด ผ้ายวิศวกรรมระบบส่ง กฟผ. J.

| Description       | Manufacturer       | Accepted Type | Accepted Voltage Level |          |            | Notes  |
|-------------------|--------------------|---------------|------------------------|----------|------------|--|
|                   |                    |               | 500 kV                 | 230 kV   | 115&69 kV  |  |
| Low Impedance     | ABB                | REB670 (*)    | ✓                      | ✓        | ✓          |  |
| Busbar Protection |                    | REB500        | ✓                      | ✓        | ✓          |  |
|                   | GE                 | P746 (**)     | ✓                      | ✓        | ✓          |  |
|                   |                    | P740 (**)     | ✓                      | ✓        | ✓          |  |
|                   |                    | P747 (***)    | ✓                      | ✓        | ✓          |  |
|                   |                    | B90 (*)       | ✓                      | ✓        | ✓          | 017  |
|                   |                    | B30 (*)       | ✓                      | ✓        | <b>✓</b> N | Only for breaker and a half, double bus double breaker |
|                   |                    |               |                        |          | , (        | or main and transfer bus arrangement.                  |
|                   | SEL                | SEL-487B (*)  | ✓                      | ✓        | ~ ~ / /    |  |
|                   | Siemens            | 7SS52 (***)   | ✓                      | <b>1</b> | ~          |  |
|                   |                    | 7SS60 (***)   | ✓                      | X        | ~ ~        | Only for breaker and a half, double bus double breaker |
|                   |                    |               |                        |          |            | or main and transfer bus arrangement.                  |
|                   |                    | 7SS85 (*)     | 1                      | OV.      | ✓          |  |
|                   | Schneider Electric | P746 (*)      | $(\mathcal{C})$        | ✓        | ✓          |  |
|                   |                    | P740 (***)    |                        | ✓        | ✓          |  |
|                   | Toshiba            | GRB100        | $\nearrow$             | ✓        | ✓          |  |
|                   | Mitsubishi         | MBP-H1A (***) |                        | <b>✓</b> | ✓          | In case of double bus single breaker arrangement,      |
|                   |                    |               |                        |          |            | maximum 8 feeders with 1 bus coupler and 2 bus         |
|                   |                    |               |                        |          |            | sections are allowed.                                  |

เอกสารควบคุม

รับรองสำนนาโดย <u>พพอ-ส. กสส-ส. อวส.</u> ก่อบน้ำไปใช้งาน ต้องตรวจสอบ Revision ลำสุด ผ้ายวิศวกรรมระบบส่ง กฟผ.

11 Feb 2022

J.

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

#### Remarks

- (\*) Applicable to IEC 61850 for both station bus and process bus with the certification specifying that the said relay conforms to "IEC 61850 edition 2 parts 6, 7-1, 7-2, 7-3, 7-4, and 8-1" and is issued by the third party laboratory.
- (\*\*) Applicable to IEC 61850 for both station bus and process bus (no certification).
- (\*\*\*) Applicable to IEC 61850 only for station bus.

#### **Notes**

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

เอกสารควบคุม รับรองสำเนาโดย <u>พพอ-ฮ. กสส-ฮ. อวส.</u> ก่องนำไปใช้งาน ต้องตรวจสอบ Revision ต่าสุด ฝ่ายวิศวกรรมระบบส่ง กฟผ.

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

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

#### <u>Notes</u>

- 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.

รับรองสำนาโดย ทพอ-ส.กสส-ส.อวส. นางสุดารัตน์ ไชยพันธุ์ กอนนาโปโซ้งาน ผู้อำนวยการฝ่ายวิศวกรรมระบบส่ง ด้องครวงสอบ Revision ล่าสุด ฝ้ายวิศวกรรมระบบส่ง กฟผ,

22 Dec 2021

11 Feb 2022

Page 1 of 1 Dec 2021