

SUPPLEMENTAL NOTICE NO.

INVITATION TO BID NO. TIEC-TX-04

SUPPLY OF 333.33 MVA 500 KV POWER TRANSFORMER

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

The attached Supplemental Notice No. 1 shall be considered as part of Bidding Documents No. TIEC-TX-04

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 facsimile No. +66 2436 0294 or email address : procurement.tse@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

May 3, 2018

(Date of Authorization)

ACKNOWLEDGEMENT

This undersigned Bidder hereby certifies that the additions, deletions and revisions set forth in this Supplemental Notice No. 1 to Invitation to Bid No. TIEC-TX-04 are incorporated as part of the above Bidding Documents and will be fully included in any bid which he may submit.

Signed _____

Title _____

Company _____

Date _____

ELECTRICITY GENERATING AUTHORITY OF THAILAND
 Nonthaburi
 Thailand
 Telex : 72348 EGAT TH
 Fax : (662) 4336317

SUPPLEMENTAL NOTICE NO. 1
 INVITATION TO BID NO. TIEC-TX-04
 SUPPLY OF 333.33 MVA 500 kV POWER TRANSFORMER
 TRANSMISSION SYSTEM IMPROVEMENT PROJECT IN NORTHEASTERN,
 LOWER NORTHERN, CENTRAL REGIONS AND BANGKOK
 AREA TO ENHANCE SYSTEM SECURITY

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

1. Section A : Invitation to Bid

Postpone the bid opening date to be **May 31, 2018**.

2. Section G: Ratings and Features

Replace pages G2 - G4 of Ratings and Features with the revised pages with (Rev.1) 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 C-3, Article C-7 Supplemental Notices.

ELECTRICITY GENERATING
 AUTHORITY OF THAILAND

May 3, 2018

**Power Transformer
Specification No. 104**



**Substation Electrical
Equipment Engineering Department**

Ratings and Features	Designed : <i>mas</i>	Validated : <i>mas</i>	Revision 8	Page 1/3
RF No. TX9910	Verified : <i>imdl</i>	Approved : <i>mas</i>	Dated : 28/07/61	

- | | |
|--|---|
| a. Type | Auto-Transformer, Single Phase, Outdoor,
Oil Immersed |
| b. Cooling Class | ONAN/ONAF/ONAF |
| c. Rated Frequency | 50 Hz |
| d. Rated Capacity | |
| - HV | 200/266.7/333.3 MVA [600/800/1000 MVA] [#] |
| - LV | 200/266.7/333.3 MVA [600/800/1000 MVA] [#] |
| - TV | 10/ 13.3/ 16.7 MVA [30/ 40/ 50 MVA] [#] |
| e. Rated Voltage | |
| - HV Side | 525/ $\sqrt{3}$ kV [525 kV] [#] |
| - LV Side | 242/ $\sqrt{3}$ kV [242 kV] [#] |
| - TV Side | 22 kV [22 kV] [#] |
| f. Nominal System Voltage | |
| - HV Side | 525 kV |
| - LV Side | 230 kV |
| - TV Side | 22 kV |
| g. Max. Continuous System Voltage | |
| - HV Side | 550 kV |
| - LV Side | 242 kV |
| - TV Side | 24 kV |
| h. Insulation Level (BIL) of Winding | |
| - HV Side | 1550 kV |
| - LV Side | 900 kV |
| - TV Side | 150 kV |
| - Neutral | 150 kV |
| i. Insulation Level (BIL) of Bushing | |
| - HV Side | 1550 kV |
| - LV Side | 1050 kV |
| - TV Side | 150 kV |
| - Neutral | 150 kV |
| j. Creepage Distance of Bushing | |
| - HV Side | ≥ 12650 mm |
| - LV Side | ≥ 6050 mm |
| - TV Side | ≥ 600 mm |
| - Neutral | ≥ 600 mm |
| k. Connection of Windings in Three Phases | Yn, a0, d1 |
| l. Positive Sequence Impedance at Rated Voltage
(Single Phase MVA Base) | |
| - HV Side to LV Side | Tap 8L / Tap N / Tap 8R
16.3% / 16.5% / 17.5% (333.3 MVA Base) |
| - LV Side to TV Side (See Note 3) | 212.0% / 212.0% / 212.0% (333.3 MVA Base) |
| - HV Side to TV Side (See Note 3) | 235.4% / 235.6% / 236.3% (333.3 MVA Base) |
| m. Off Load Tap Changer | |
| n. On Load Tap Changer | |
| - Tapping Range Base on Rated Voltage | ±10% on HV Side with 1.25% Step |
| - Insulation Level (BIL) | ≥ 1050 kV |
| o. [#] Temperature Class of Winding Insulation | 120 |

For three single phase transformers connected to form a three phases bank.

**Power Transformer
Specification No. 104**



**Substation Electrical
Equipment Engineering Department**

Ratings and Features	Designed : <i>Nov 82</i>	Validated : <i>[Signature]</i>	Revision 8	Page 2/3
RF No. TX9910	Verified : <i>[Signature]</i>	Approved : <i>[Signature]</i>	Dated : 28	<i>[Signature]</i>

- p. Winding Temperature Rise when Carrying
Max. Continuous Rated Capacity
- Winding Average ≤ 60 °C
 - Winding Hottest Spot ≤ 75 °C
 - Top Oil ≤ 60 °C
- q. Average Audible Sound Pressure Level at Rated Voltage and Frequency
- Without Fan ≤ 74 dB(A)
 - With Fan ≤ 76 dB(A)
- r. Surge Arrester, Station Class, Tank Mounted; Complete with Discharge Counter HV Side (see detail in RF -)
- Qty. per Phase None
 - Voltage Rating N/A kV
- LV Side (see detail in RF SA8Y11)
- Qty. per Phase 1
 - Voltage Rating 192 kV
- TV Side (see detail in RF SA2D01)
- Qty. per Phase 1
 - Voltage Rating 24 kV
- s. Bi-directional Wheels With Without
- t. Parallel Operation Requirement (between HV and LV side)
- Not Required
 - With Future Transformer or Each Other in the same Substation
 - With Existing Transformer in accordance with Dwg. No. _____ attached
- u. Bushing Current Transformer
- HV Side
- Qty. per Phase 2
 - Accuracy Class C2000
 - Ratio 200/400/600/800/1000/1200/1400/1600 : 1 A
 - Thermal Current Rating Factor 1.0
- LV Side
- Qty. per Phase 2
 - Accuracy Class C800
 - Ratio 500/1000/1500/2000/2500/3000/3500/4000 : 5 A
 - Thermal Current Rating Factor 1.0
- TV Side
- Qty. per Phase (On Y1) 2
 - Accuracy Class C400
 - Ratio 400/800 : 5 A.
 - Thermal Current Rating Factor 1.0
- Neutral
- Qty. per Phase 1
 - Accuracy Class C1000
 - Ratio 50/100/150/200/250/300/400/450/500/600 : 1 A
 - Thermal Current Rating Factor 1.0
- v. Max. Permissible Shipping Weight 150 tons (See Note 1)
- w. Max. Permissible Shipping Dimension 3.5 m × 10.0 m × 4.0 m (W×L×H) (See Note 1)
- x. Applicable Standards IEEE Std. C57.12

**Power Transformer
Specification No. 104**



**Substation Electrical
Equipment Engineering Department**

Ratings and Features	Designed : <i>note</i>	Validated : <i>[Signature]</i>	Revision 8	Page 3/3
RF No. TX9910	Verified : <i>tmg?</i>	Approved : <i>[Signature]</i>	Dated : <i>28/10/61</i>	

- Note : 1. Exception to the weight and dimension limitation stated in Article : Clearance and Weight Limitations.
2. The positive sequence impedance from HV side to LV side shall have a tolerance of $\pm 5\%$ of specified value.
3. The HV-TV and LV-TV impedance voltage shall be designed to limit tertiary fault level to ≤ 500 MVA (3 phase) during fault conditions. Calculation showing such fault limitation shall be included in Bidding document. External current limiting reactor are not acceptable.

Regarding the effect of different impedance voltage in HV-TV and LV-TV, the transformer shall be designed to be capable of connection with other manufacturer's units; especially, having successful combination as a transformer bank without any performance deterioration.

4. Transformer shall be considered as transformer bank No.1 of which provision shall be made for future parallel operation upto 4 transformer banks according to drawing No. TP-E-10.12 " TYPICAL SCHEMATIC DIAGRAM OF FOUR-500/230 kV TRANSFORMER BANK PARALLEL OPERATION ".
5. The transformer shall be designed to withstand the following fault occurrence rates with the expected transformer life of 25 years.

Current Intensity	Times/Year
100 %	1
50 %	20
20 %	100

Where the 100 % current intensity means the maximum value of the short circuit current.

6. Radiators shall be designed to be attached to the transformer tank. The radiator bank located on separated foundation from the transformer foundation is not acceptable.
7. The physical arrangement of the terminal blocks for external connection in the phase control cubicle and common control cubicle shall be the same as arrangement in the existing transformer for convenient interchangeable purpose. The drawing of the physical arrangement of terminal blocks of the existing transformer will be submitted to the contractor after award of contract.
8. The main tank of transformer transported from Thai port to site is strongly required to be placed on vehicle in an upright position. Uprighting of main tank when unloading at site shall not be accepted.
9. Exception to the Specification. All bushings of the maximum line-to-ground voltage below 69 kV shall be solid type with cemented flange.