

Phone No. 080-22243926

Fax No. 080-22110134

Website:www.kptcl.com



Email ID:dgmtkptcl@rediffmail.com

**KARNATAKA POWER TRANSMISSION CORPORATION LIMITED**

Corporate Identity Number(CIN):U40109KA1999SGC025521

No:B19/10400/2020-21

Encl: 83<sup>rd</sup> TCCM Proceedings

Corporate Office,  
Kaveri Bhavan,  
Bengaluru-560 009,  
Dated:08.09.2020.

To,

All Chief Engineer (Electy),  
Transmission Zone,  
KPTCL,

Sir,

**Sub:-** Providing Nitrogen Injection Fire Protection System (NIFPS) to Power Transformers of capacity 10MVA and above in KPTCL Sub-stations.

- Ref:-**
1. Proceedings of 44<sup>th</sup> & 83<sup>rd</sup> TCC meeting held on 02.12.2008 & 18.05.2020 respectively.
  2. I.O Note No:CEE(T&P)/SEE/EE(P)/AEEP-1/2020-21/5190 Dt:10.08.2020 of CEE (Tendering & Procurement), KPTCL, Bengaluru.
  3. Note No B19/10400/20-21 approved by Director (Transmission), KPTCL on 05.09.2020.

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During 44<sup>th</sup> TCCM held on 02.12.2008 the proposal for providing Nitrogen Injection Fire Protection System (NIFPS) for Power Transformers of rating 20MVA and above was approved and the same is in practice. However, as per Central Electricity Authority Regulations 2010, the committee in 83<sup>rd</sup> TCCM held on 18.05.2020, approved to provide Nitrogen Injection Fire protection System (NIFPS) for Power Transformers of rating 10MVA and above in order to protect the sub-station from all major & minor fire risks. Copy of the 83<sup>rd</sup> TCCM proceedings is enclosed for information.

In this regard, I am directed to inform to arrange to include Nitrogen Injection Fire Protection System (NIFPS) for Power Transformers of rating 10MVA and above in KPTCL Sub-stations while preparing the estimates.

Yours faithfully,

Deputy General Manager (Tech)

KPTCL.

EECIT-1)  
B.S. J. J.  
09/09/2020

**Copy to:**

1. The Chief Engineers Electy, T&P/P&C/RT and R&D/TA & QC, KPTCL for information.
2. All Superintending Engineers(Ele.), Transmission (W&M/M/W) Circles, KPTCL.
3. Superintending Engineers(Ele.), IT & MIS, KPTCL, Kaveri Bhavan, Bengaluru to upload in KPTCL website.
4. All Executive Engineers(Ele.), TL&SS Division and Major works Division, KPTCL.

- i. Carry out a quarterly review of the Transmission system in the region; assess the growth in generation capacity and the demand in various parts of the region; and draw up proposals for strengthening inter-regional transmission system. The transmission planning is required to keep in mind the areas where the generation is likely to grow and areas where load demand will grow so that the transmission system ahead of the mandate under the Tariff policy of developing transmission system ahead of the generation for ensuring smooth operation of the grid.
- ii. Assess the transmission system requirements in the near, medium and long term and draw up the transmission schemes to meet these requirements. While doing this a perspective plan for the next 15-20 years may also be kept in mind and accordingly the requisite allowance/margin may be factored in the system during planning process.
- iii. Examine applications for connectivity and access and ensure that these are granted speedily, provided that the requisite fees/ charges are paid.
- iv. Review the upstream and downstream network associated with transmission schemes.
- v. Examine and evaluate the intra-state transmission proposals.
- vi. Review and facilitate the construction of the inter-regional grid strengthening schemes.

**6. The subject of Reconstitution of "National Committee on Transmission (NCT)" and Constitution of Five "Regional Power Committees (Transmission Planning)" (RCPTPs) with the associated terms of reference is placed before TCC meeting for information.**

***subject-G2: Providing Nitrogen injection fire protection system (NIFPS) for Power Transformers of rating 10MVA and above.***

**Proposed by: CEE (P&C)**

**1.0 Preamble:**

Nitrogen Injection Fire Protection System (NIFPS) is a fire protection system which prevents oil tank explosion or rupture and possible oil fire in the event of minor nature of arcing due to internal faults in Oil filled Power transformer.

It also prevents damage to transformer and accessories in case of fire by external causes such as bushing fire, OLTC fire, fire from surrounding equipment's etc.

The system will drain a pre-determined quantity of oil from the tank top through outlet valve to reduce the tank pressure and inject nitrogen gas at high pressure to create stirring action and reduce the temperature of top oil surface below flash point to extinguish the fire.

Presently in KPTCL system Nitrogen Injection Fire Protection System (NIFPS) is provided for power transformers of 20MVA and above ratings only since the failure rate of 10MVA and below transformers due to internal fault or due to fire is less.

### **2.0 Central Electricity Authority Regulations 2010.**

Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) has issued following guidelines as per Regulations 2010.

All major and minor fire risks in the Substation shall be protected against fire by suitable automatic fire protection systems.

#### **Following systems shall be generally adopted for various fire risks:**

- a. Automatic high velocity water spray system, complying with TAC guidelines, shall be provided for the following areas:
  - i. Transformers of rating 10 MVA and above or oil filled transformers with oil capacity of more than 2000 liters;
  - ii. Alternatively, these transformers may be provided with Nitrogen injection based fire protection system. The transformers of 220kV or higher voltage may preferably be provided with Nitrogen injection based fire protection system in addition to automatic high velocity water spray system;

As per prevailing practice Automatic high velocity water spray system is not being provided in KPTCL system as protection for power transformers.

In this regard, it is opined that provision of Nitrogen Injection Fire Protection System (NIFPS) may be considered for 10MVA and above rating transformers as recommended in Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010.

**Discussion:** The Committee discussed the subject in detail. SEE (T) explained to the Committee that in 44<sup>th</sup> TCCM held on 02-12-2008, the proposal to provide Nitrogen gas fire fighting equipment to 20 MVA, 66/11 kV Transformer was approved and hence in KPTCL system, Nitrogen Injection Fire Protection System (NIFPS) is provided for power transformers of 20MVA and above ratings only since the failure rate of 10MVA and below transformers due to internal fault or due to fire is less.

*Nitrogen Injection Fire Protection System (NIFPS) is a fire protection system which prevents oil tank explosion or rupture and possible oil fire in the event of minor nature of arcing due to internal faults in Oil filled Power transformer.*

*However, Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) has issued the guidelines as per Regulations 2010 that all major and minor fire risks in the Substation shall be protected against fire by suitable automatic fire protection systems. Automatic high velocity water spray system, complying with TAC guidelines, shall be provided for the areas of transformers of rating 10 MVA and above or oil filled transformers with oil capacity of more than 2000 liters. Committee observed that as per prevailing practice Automatic high velocity water spray system is not being provided in KPTCL system as protection for power transformers and opined that provision of Nitrogen Injection Fire Protection System (NIFPS) may be considered for 10MVA and above rating transformers as recommended in Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations 2010.*

**Decision: Approved** to provide Nitrogen Injection Fire Protection System (NIFPS) for 10MVA and above rating transformers.

**Action:** CEE, All Transmission Zone, CEE T&P & CEE P&C.

**Subject-G3: Extending the concession rate of 50% of rate chargeable by CPRI for testing of transformer oil to KSPDCL for their 8 nos. of 220kV & 1 no. of 66kV substations at Pavagada solar park.**

**Ref: Note no. CEE/RT&R&D/SEE/EEE/KCO80/2019-20/02 dated 24-4-20 of CEE (RT&R&D) submitted to Director(Transmission)KPTCL**

1. In the CEE (RT&R&D) note, it is stated that KSPDCL has commissioned 8 numbers of 220kV substations and one number of 66kV Substation near Pavagada for evacuation of 2000MW solar power. Now KSPDCL has engaged in Operation and maintenance of those Substations and 220kV line from each of the substation up to Powergrid 400/220kV Pavagada Substation extending Grid connectivity to these substations.
2. As a part of annual preventive maintenance, KSPDCL has planned testing of Transformer oil samples of 150MVA and 8MVA power transformers, relay calibration and meter testing of all the above substations and have requested KPTCL to conduct the same on chargeable basis. For conducting the above said tests KPTCL has issued intimation based on latest Major Works Schedule of Rates.
3. KSPDCL has requested KPTCL to extend them the concessional rates (50% of charges) offered to ESCOMs as per Major Works SR 2019, as it is a JV company with the stake

