



सत्यमेव जयते

भारत सरकार
Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली अभियांत्रिकी एवं प्रौद्योगिकी विकास

प्रभाग

Power System Engineering & Technology
Development Division



To,
As per List.

विषय: ट्रांसफॉर्मर पर सीबीआईपी मैनुअल में शामिल ट्रांसफॉर्मर/रिएक्टर के लिए नाइट्रोजन इंजेक्शन सिस्टम के संबंध में प्रावधानों के मुद्दे पर सोमवार, 19 दिसंबर, 2022 को अपराह्न 3.00 बजे सदस्य (पी एस), सीईए की अध्यक्षता में हुई बैठक के कार्यवृत्त।

Subject: Minutes of the Meeting held to discuss the issue of provisions regarding Nitrogen Injection System for Transformers/Reactors as covered in the CBIP Manual on Transformers.

Sir/Madam,

Please find enclosed the minutes of the meeting held on 19-12-2022 at 03:00 PM chaired by Member (PS), CEA to discuss the issue of provisions regarding Nitrogen Injection Fire Protection and Extinguishing System (NIFPES) for Transformers/Reactors as covered in the CBIP Manual on Transformers.

Encl. As above,

भवदीय

(योगेन्द्र कुमार स्वर्णकार/Y.K.Swarnkar)
निदेशक/Director

Copy to:

1. SA to Chairperson, CEA
2. SA to Member(PS), CEA

Minutes of the Meeting held in CEA under the Chairmanship of Member (PS), CEA on Monday, December 19, 2022 at 3.00 pm on the issue of provisions regarding Nitrogen Injection Fire Protection & Extinguishing System (NIFPES) for Transformers/ Reactors as covered in the CBIP Manual on Transformers.

List of participants is enclosed at **Annexure**.

1. Member (PS) welcomed the participants to the meeting and briefed about the agenda of the meeting. He informed that complaints are coming from various quarters citing that Nitrogen Injection Fire Prevention and Extinguishing System (NIFPES) for Transformers/Reactors as laid down in the CBIP manual on Transformers favours a particular vendor and thus creates monopoly for that vendor and due to which other vendors offering similar product using same or different logics for initiation are unduly deprived of opportunities to participate in the bids. He emphasized that only one manufacturer in the market kills the need for innovation and new technology, as other manufacturers do not find their chance in the market. He requested Director (PSE&TD), CEA to elaborate the agenda and seek views of the participants.
2. Director (PSE&TD) informed that CEA had notified Central Electricity Authority (Measures relating to Safety and Electricity Supply) Regulations in 2010 which specify the use of either High Velocity Water Spray System or NIFPES for fire protection of transformers. He further informed that at present there is no Indian Standard for NIFPES. CBIP Manual was published in 2013 and at that time only one vendor was available but a number of vendors are available who should also be given adequate opportunity so that the most cost effective and efficient system is procured by the utilities. Extant provision thus becomes a deterrent to development/ deployment of latest technologies and technological evolution. He sought the views of CBIP, user industry, manufacturers of Transformers and procurers present in the meeting.
3. CBIP representative stated that NIFPES specification in the CBIP Manual was prepared in consultation with various stakeholders and welcomed any suggestions if the provision is restrictive and favours any particular vendor. He suggested that any standards/guidelines for fire prevention and extinguishing system should not lean towards any technology/system and should not be restrictive to others. The extant CBIP manual is in the nature of guidelines and not mandatory to be followed by the transformer users. He further expressed that the CBIP would go by the decision taken in the meeting.
4. Shri S.S. Mishra, Ex-NTPC, stated that they were also involved in the exercise for the preparation of the instant Manual of CBIP, and the provisions for fire protection and extinguishing were laid down based on the available information and knowledge. However, it's not a compulsory document and necessary clarification may be issued by

CBIP in this regard to avoid any confusion. At the current juncture, all users are facing the issues of monopoly and bias towards a particular system/technology. He told that due to this, NTPC stipulates generic specifications in the tender for fire protection and extinguishing systems for Transformers. Thus, other vendors are also able to supply the systems on a level playing field.

5. MPPTCL representative suggested that whatever wrongs are noticed in the instant provisions in the manual, they can be set right by withdrawing the same. What Fire Protection and Extinguishing System to be deployed should be the discretion of the user and not the vendor. He stated the extant technology provisioned in the manual is rather slow, by the time it acts much havoc would have been caused. He said now much faster and effective technologies are there to choose from and users should be allowed to do so.
6. MPPGCL representative also suggested that NIFPES for Transformers should be technology agnostic.
7. M/s Adani Transmission representative stressed that NIFPES is a critical system and it shouldn't malfunction. He said that they have encountered malfunction in the system. The system should be EMI/EMC compliant. Control Cable rated for 750°C should be used.
8. POWERGRID representative was of the view that the call by CEA in consultation with the stakeholders was a need of the hour. Till BIS standards on the instant matter are published, the NIFPES specification in CBIP Manual should be withdrawn. As for POWERGRID, he said that they deploy high velocity water spray system for Transformers of 400 kV and above for large number of units due to better cost-benefit ratio. For 220 kV and below transformers, NIFPES is used if number of units are small.
9. Representative from DTL stated that at that time NIFPES was the only system, so it was included in the guidelines in the manual. However, the technology is not mandatory and cannot be made mandatory. CBIP may review the manual and include other technologies as well. He emphasized that transformers are critical and expensive component of the transmission grid and any new technology should not be made mandatory without proper vetting. The utility may also be allowed to use technologies based on their past experiences. A particular patented technology should not be allowed. Utilities may be allowed to use any specifications which serve their purpose. He further suggested that arc sensors be deployed in parallel to differential relays, circuit breaker be tripped, transformer be isolated and event logger be incorporated to capture signals mainly in case of mal-operation.
10. UJVNL representative stated that they have installed NIFPES for their 220kV level and above. He said BIS while laying down standards for NIFPES should also specify specifications for its critical components such as cable etc.

11. Director, OPTCL, informed that rupture disk technology is expensive and not feasible to implement. The flow rate of nitrogen depends on the rating, size of tank and quantity of oil in the transformer. Hence, these should be considered in the drafting of detailed specifications of NIFPES.
12. Director (Operation), OPTCL stated that Nitrogen flow rate design matters as a main criteria.
13. BHEL representative opined that specifications for NIFPES should be broad-based. The technology should meet the functional requirements and provisions should also include testing requirements. Section on the NIFPES for Transformers in the CBIP manual should be withdrawn and Central and State utilities may be issued the circular informing them of such withdrawal of the contested provision from CBIP manual.
14. BHEL Bhopal representative expressed the view that even stipulating the requirement of arc sensors would not solve the instant issue. He suggested that the extant provision in CBIP manual be kept in abeyance.
15. GE representative informed that system is not accurate enough to detect spurious events and there have been instances where the system has detected spurious events in the past which was discovered during site visits by their inspection team. They welcomed the use of different technologies to ensure better detection and monitoring.
16. Hitachi representative was of the view that other technologies be opened for deployment. Most of the things are already specified but the operation functioning should be free from mal-operation. All practical aspects should be discussed before formulating the standards.
17. Director (PSE&TD) requested all participants to share the generic specifications being used by them for procurement of NIFPES.
18. After all threadbare deliberations, it was decided that the provisions related to fire safety of transformers as laid down in the CBIP manual be withdrawn. CBIP will withdraw the provision and inform all concerned users and manufacturers of the same.
19. Member (PS) in his concluding remarks stated that though CBIP made the provisions about NIFPES for Transformers in their manual with noble intent and after deliberations with the stakeholders, these provisions have now, with advent of plethora of latest NIFPES technologies/ systems, become unduly favourable to a particular technology/system/vendor. He stated that with the existence of a host of new and more effective technologies, it is apt and in the interest of the sector, as expressed by all participants that we withdraw the contested provision from CBIP manual. He further informed that CEA has already requested BIS to take up the work of framing Standards for NIFPES on priority basis and exhorted participants to approach

BIS to formulate these standards. He advised that the industry, manufacturers and the users should help BIS with their experience and knowledge so as to bring out the most appropriate and technology agnostic standards for NIFPES for Transformers. Meanwhile utilities should be guided by functional requirements for effective fire protection and extinguishing system (internal and external causes). Any specific tenders to be floated should neither be restrictive nor inclined towards any particular make/system/patented technology.

20. Outcome of the meeting is as follows:

- (a) CBIP may withdraw specification of NIFPES from its Manual on Transformers and communicate to all utilities and should mention that CBIP manual is only for reference purpose and not to be followed mandatorily.
- (b) BIS may prepare Standards for NIFPES on priority basis and suitable representation from the utilities may be included in the Committee established for this purpose.
- (c) Utilities should frame their specifications in such a way that the specifications are neither restrictive nor inclined towards any particular make/system/ patented technology.
- (d) Utilities may share their existing specifications of NIFPES to CEA for reference and review.

Meeting ended with the vote of thanks to the chair.

List of Participants

CEA

1. Shri A.K. Rajput, Member (Power Systems)
2. Shri Surata Ram, Chief Engineer (RT&I/R&D)
3. Shri Ram Chandra, Chief Engineer, PSE&TD Division
4. Shri Y.K. Swarnkar, Director, PSE&TD Division
5. Shri Sunit Gupta, Director, R&D Division
6. Shri Mohit Mudgal, Deputy Director, PSE&TD Division
7. Shri Manoj H P, Assistant Director, PSE&TD Division
8. Shri Anshul Kumar, Assistant Director, PSE&TD Division

POWERGRID

1. Shri Vibhay Kumar
2. Shri M K Gupta
3. Shri Vineet Kumar Singh
4. Shri Richik Manas Das

CTUIL

1. Shri Sourov
2. Shri K.K. Sarkar

NTPC

1. Shri S. S. Mishra (Retd.)
2. Shri Kamal Kishore Verma
3. Ms. Shipra Tyagi

GE

1. Shri Kartik Shrivastava
2. Shri Gaurav Kumar
3. Shri Govind Srivastava

OPTCL

1. Shri Upendra Kumar Pati
2. Ms. Sharmistha

UJVNL

1. Shri Ambrish Sharma

CBIP

1. Shri A. K. Dinkar
2. Shri Sanjeev Singh

Hitachi

1. Shri Tarun K. Garg

IEEMA

1. Shri Rishabh Joshi
2. Shri Uttam Kumar

DTL

1. Shri Loveleen Singh
2. Shri Hitesh Kumar

MPPTCL

1. Shri P K Gargava
2. Shri Sanjeev Shrivastava

BHEL

1. Shri R K Singh
2. Shri V K Bassi
3. Shri Anand Soni
4. Shri Anil Gautam

Adani

1. Shri Rajesh Kumar Gupta
2. Shri Susanta Kumar Padhy
3. Shri Sanjay Bhatt

RVPNL