

SUPPLEMENTARY AGENDA NOTE FOR 16TH STANDING COMMITTEE ON POWER SYSTEM PLANNING IN SOUTHERN REGION TO BE HELD ON 20TH JANUARY AT KAIGA GENERATING STATION, NPC.

EVACUATION SYSTEM AND START-UP POWER FOR KUDANKULAM APP (2000MW):

Kudankulam APP with a capacity of (2x1000MW) under Stage-I is being taken up by NPCIL and is programmed for commissioning in the early 11th Plan. NPCIL would need to firm up with constituents to finalize the allocation of capacity to the beneficiaries. However, as the actual delivery of power from this station located in the South most part of the region, would take place though displacement with power physically absorbed in KSEB and Southern TNEB system and other beneficiaries getting their shares by displacement, the transmission system for evacuation of Kudankulam power has been evolved ahead of finalisation of share allocation.

Evacuation system:

The transmission system requirements for 2000MW evacuation from the Kudankulam project have been identified by CEA based on power flow studies for peak load condition corresponding to 2007-08 time frame. The step-up voltage at Kudankulam is 400kV. The studies have indicated need for six number 400kV outlets from the power station with following transmission system:

1. LILO of both circuits of Madurai-Thiruvananthapuram 400kV D/C line at Kudankulam APP – 2xD/C LILO
2. Kudankulam APP – Thiruvananthapuram 400kV D/C line with QUAD conductor (3rd and 4th Circuits, the first two through LILO at 1. above)
3. Thiruvananthapuram – Pallom 400kV D/C line with QUAD conductor
4. Pallom – Trissur 400kv D/C line with QUAD conductor
5. Establishment of new 400/220 kV Sub-station at Pallom with 6 nos. 400kV line bays, 2x500 MVA 400/220kV transformer capacity, 6 nos. 220kV line bays for 3xD/C 220kV LILO or tie-lines for connecting to 220kV network..
6. Extension of Thiruvananthapuram 400/220 kV substation for 4 additional 400kV line bays and provision of 3rd 315MVA 400/220kV transformer.
7. Extension of Trissur 400/220kV substations for 2 additional 400kV line bays and provision of 3rd 315 MVA 400/220kV transformer.

The studies have shown that the transmission system as proposed above would meet the planning criteria under normal as well as contingency conditions. The option of having 400kV line extended up to Kozhikode has also been studied but the flow on this line does not justify its inclusion under the scheme. As such, supply to Kozhikode via Mysore would be sufficient to meet the requirements of Northern Kerala.

The following case studies are enclosed:

- Exhibit-I: Base case.
- Exhibit-II: Outage of Kudankulam-Madurai 400kV D/C
- Exhibit-III: Outage of Kudankulam- Thiruvananthapuram 400kV D/C QUAD

- Exhibit-IV: Outage of Thiruvananthapuram – Pallom 400kV D/C QUAD
Under this outage, the 220kV system from Thiruvananthapuram gets marginally overloaded. This needs to be further studied with detailed representation of underlying network in the area so that necessary re-alignments in the KSEB 220kV system could be worked out.
- Exhibit-V: Option of having additional Trissur-Kozhikode 400kV line.

Arrangements for Start-up Power:

As per the planning criteria, an atomic power project should have two independent sources of supply for start-up power.

Kudankulam would also have 220kV level and the 400kV bus at Kudankulam is proposed to be connected to 220kV bus with 2x315MVA transformers. Earlier, two nos. 220kV Zebra conductor S/C lines – one from Tuticorin, which is a strong and reliable supply point, and one from Kayathar, which is also a reliable source and was proposed to be upgraded to 400kV substation, were proposed. While the proposal for Tuticorin-Kudankulam line could be retained, the proposal for Kayathar-Kudankulam line may need reconsideration as the programme for 400kV substation at Kayathar has since been deferred/dropped. As such, the second 200kV line to Kudankulam could be from Thiruvananthapuram if ROW is possible. However, if ROW from Thiruvananthapuram is not feasible, the second line could be retained from Kayathar as per earlier proposal Accordingly the following lines are proposed for start-up supply arrangements for Kudankulam:

1. Tuticorin-Kudankulam 220kV S/C Zebra conductor line.
2. Thiruvananthapuram-Kudankulam 220kV S/C Zebra conductor line if ROW from Thiruvananthapuram is found to be feasible, otherwise, Kayathar-Kudankulam 220kV S/C Zebra conductor line.

The 220kV bus at Kudankulam is proposed to be connected to 400kV bus with 2x315MVA Parallel operation of the above lines with 400kV lines has been studied and no problem of 220kV overloading or circulating MVAR has been observed. Therefore, these lines can be kept, if required, normally connected and used for supplementing the power evacuation resulting in reduced losses.

TNEB had also proposed to have a 220kV substation of their own at Kudankulam(Nagercoil). This could be connected to Kudankulam through a 200kV D/C or 2xS/C line(s) of very short length. The cost of this interconnection along with associated 220kV bays at Kudankulam is to be borne by TNEB.

The members may discuss the issue.