*** GENERATION WORKS SECTION***

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Ref No. CE/WORKS/O&M SG/P/ Date: 28/02/2014

**FAX / E-MAIL**

To,

The Chief Engineer (O&M),

MSPGCL

Bhusawal/Nasik/Parli/Chandrapur/

Khaperkheda/Koradi/Paras, TPS/Uran

Sub: MOM of Seminar on “ Setting guidelines for all HT Incomers & Auxiliary feeders

along with grading Techniques ”.

Ref: MOM of VI th EPC meeting held at Paras TPS on dtd. 21-1-2014

Seminar on “ Setting guidelines for all HT Incomers & Auxiliary feeders

along with grading Techniques” was conducted at KHAPARKHEDA TPS on 28/02/2014. The Seminar was held under the chairmanship of Committee Chairman Chief Engineer Khaperkheda TPS. Faculty was Shri P A Amilkantwar EE from PARLI Thermal Power Stations, Shri A.B.GUDSURKAR DyEE, Pophali HPS ,Shri A.K. Patil SE(EST) along with HO team and Engineers from all power stations have attended the Seminar.

Committee Chairman expressed the need for arranging such a seminar and how it will be useful to the participants in increasing their knowledge & thus increasing availability and reliability of the plant. He advised the participants to take valuable tips from Seminar & further appealed to analyze the problems thoroughly, share experience with others & find out the root cause analysis, so that problems will not repeat in future.

1. The session was started with basics of electrical protections. Also there was a view to avoid trappings due to grading problems.

Following points were covered in detail

1. Protections used for different types of feeders of HT switchgear i.e. Motor feeder, Transformer feeder, Incomer, Tie feeder etc.
2. Grading techniques for setting selection of Incomer and Tie feeders were discussed in details. Following guidelines given for,
   1. IDMT over Current Protections.
      * Calculate Nominal load on the board.
      * Add 10 % extra and consider next available PSM on the relay.
      * Verify the trip time is more than the starting time of biggest auxiliary, with starting current of biggest auxiliary in vector addition with nominal load.
      * if not go to next PSM available and repeat above step .
   2. High set Over Current Protections.
      * Current setting must be less than the fault level at that point.
      * Current setting should be greater than nominal load on the down stream + starting current of biggest auxiliary connected on the down stream of this breaker.
      * It must not be less than the Current setting on any of the down stream breaker.
   3. Time delay setting to High set:
      * The Highest delay should not be more than 300 msec.
      * The step of 100 msec. is preferably used for every step of grading.
      * Where there are more than 3 steps involved than accordingly lower step may be used.
   4. Tripping on Earth fault is not to be provided. Except long distance outdoor tie feeders.
3. Simplified method for fault level calculations is demonstrated along with readymade programmed excel sheet for Short circuit calculations along with earth fault level calculations.
4. Different types of Neutral Grounding Systems for power system, studied with its merits and demerits.

* Ungrounded System.
* Neutral Grounding with solid Earth.
* Neutral Grounding with Resistance.

a. Neutral Grounding with High Resistance.

b. Neutral Grounding with low Resistance.

c. Neutral Grounding with NGT and Resistance.

1. Earth fault protection must be provided to every HT feeder except Incomer and Tie.
   * + Earth fault protection current setting must be less than the steady state earth fault level at that point.
     + Time delay should be 1 to 2 Sec.
2. **During second session, discussions on the typical faults occurred in different power stations were carried out and recommendations to avoid recurrences are given.**
   1. Pressure transmitter on top of main tank of transformer is provided to GTR at PARLI TPS.

Advantages:

1. It monitors oil level in conservator.
2. it monitors Transformer tank pressure, on both sides (Pressurization and vacuum)
3. Especially it is useful when air cell is provided in the conservator. There will be possibility of vacuum formation under oil leakage conditions. Any abnormal pressurization and vacuum formation is dangerous to transformers.

Scheme:

* DP transmitter is used.
* Location of transmitter is at the upper surface level of the tank.
* Signal tapping is provided through spare flange and root valve for isolations.
* The transmitter range used 0 to 3000 mmwcl. Normal pressure being 2300 to 2400 mmwcl.
  1. The events of UAT failure at Nasik and Koradi were discussed.

**Conclusions**:

* Mostly UAT failure is due to problems in tap changer
* In most of the Power Stations, in 210 MW sets, the UAT are with offload tap changer.
* The operation of tap changer is not required as it is connected to regulated output of generator.
* **Hence it is recommended to bypass tap changer power contacts by solid copper link.**
  1. The events of operation of REF at Paras TPS for outside zone earth faults discussed.

**Recommendations:**

* to carry out the stability test to ensure CT polarities.
* Testing of CTs for knee point voltage.
* Checking of stabilization resistance for correctness.

**FEEDBACKS from Participants :**

1. CTPS: Seminar to be arranged on excitation.
2. NTPS: Letter to be given to higher authority about setting/grading changes.
3. PARAS: Setting to be shown on single line diagram
4. URAN : Seminar on Generator fault protection, excitation is needed.

It is assured by coordinator Shri A.K. Patil to arrange a special one day seminar on excitation & generator fault protection in last week of March-14 along with viith  EPC meeting.

Seminar at KPKD ended with thanks from Shri Shinde Dy EE training subcentre KPKD.

Chief Engineer

(Khaparkheda TPS**)**

Encl:

1. List of the participants
2. PPT of the seminar.
3. Programmed Excel sheet for short circuit level calculations.

**Copy s.w.r.s to:**

1) Director (Operations)

2) Executive Director (O&M)

3) Committee Chairman (CE K’Kheda TPS)

4) Chief Engineer (WORKS)

**Copy to: Committee members**

1. Shri N R Deshmukh, SE (Bhusawal TPS)
2. Shri A K Patil, SE(EST)
3. Shri P A Amilkanthwar, EE ( Parli)
4. Shri B D Chakraborty, EE (Khaparkheda)
5. Shri V A Desai, EE (Khaparkheda)
6. Shri K S Deshmukh, DyEE(Paras TPS)
7. Shri M K Nanwatkar, DyEE (Nasik TPS)
8. Shri A P Pahurkar, A.E.(Koradi TPS)