

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 Office of Nuclear Reactor Regulation, Director

SUBJECT: Forwards outline of proposed procedure for reanalysis of adequacy of station electric distribution sys voltages, as discussed at 830913 meeting w/NRC re 830801 actuation of degraded voltage protection logic.

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September 26, 1983

Director
Office of Nuclear Reactor Regulation
U S Nuclear Regulatory Commission
Washington, DC 20555

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Proposed Procedure for Re-analysis of Adequacy of
Station Electric Distribution System Voltages

On September 13, 1983 Northern States Power Company met with the NRC Staff to discuss the August 1, 1983 actuation of the Monticello degraded voltage protection logic and subsequent Staff questions related to our 1981 analysis of the station electric distribution system. During this meeting Northern States Power Company proposed a procedure for re-analyzing the station electric distribution system in a way in which allowable ranges of switchyard voltages could be determined. We agreed to provide for NRC Staff review an outline of this procedure. We would utilize this technique in the analysis required by item (9) of the NRC Confirmatory Action Letter dated August 31, 1983.

Attached is an outline of the procedure we are proposing for re-analysis of station electric distribution system adequacy.

Please contact us if you have any questions related to the methodology we are proposing. Early NRC Staff review and approval of an analysis methodology is required to permit the work to be completed by the required date.

David Musolf
Manager - Nuclear Support Services

DMM/bd

c: Regional Administrator-III, NRC
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Attachment

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September 26, 1983
Director of NRR, NRC
Attachment

OUTLINE FOR RE-ANALYSIS OF MONTICELLO ADEQUACY OF
ELECTRIC DISTRIBUTION SYSTEMS VOLTAGES

1. Description of System

Describe the offsite sources for the safeguards busses. Include a one-line diagram showing all safeguards busses, all sources to the busses, and all loads supplied by the busses.

Provide a table showing the ratings of transformers used to supply the safeguards busses.

Provide a table showing the characteristics of the loads on the safeguards busses.

Provide a table showing all assumed impedances.

Briefly describe the load rejection and restoration scheme. Describe grouping and timing of load for each offsite source. Provide a table showing settings (voltage and time) of all relays involved in load rejection and restoration logic.

2. Voltage Analysis Procedure

A. Reconfirm thru testing and/or analysis the minimum allowable voltage on the safeguards 480 volt motor control centers. This was previously based on measured motor starter contactor pickup requirements.

B. Determine the voltage necessary on Bus 15 and 16 to maintain the minimum allowable on the 480 volt motor control centers with:

1. full station auxiliary load
2. ECCS actuation
3. cooling tower load tripped

This value should be the degraded voltage relay setpoint.

C. Add relay tolerance and reset to the voltage arrived at by (B) above.

D. Determine the voltage required on each source (i.e. 115Kv bus, generator terminals, and 345Kv bus) to ensure that the degraded voltage relays will reset following an ECCS actuation. Full station auxiliary load with the cooling tower tripped is assumed when the 1R or No. 11 transformers are analyzed. Normal load shed is assumed when the 1AR transformer is analyzed.

E. Determine the voltage required on each source (i.e. 115Kv bus, generator terminals, and 345Kv bus) to ensure that the degraded voltage relays will reset following placing all torus cooling into service with full station auxiliary load, including the cooling tower load (1R or No. 11 transformer source only).

F. Determine the maximum allowable voltage on each source (i.e. 115Kv bus, generator terminals and 345Kv bus) to ensure that the station auxiliary bus voltage does not exceed 4400 volts, steady state, with minimum station auxiliary load.

G. Determine thru analysis that motor starting transients will be acceptable. This means showing:

1. Motor will successfully accelerate connected loads.
2. Duration of voltage transient will not cause degraded voltage transfer actuation.

3. Evaluation of Results

The results of the voltage analysis will establish an allowable range of voltage for each switchyard bus to be considered acceptable.

Compare the allowable range with historic values of switchyard voltages.

Establish administrative procedures and controls to:

- A. Facilitate correcting voltage levels outside the allowable ranges.
- B. Provide direction to operators if source voltages cannot be maintained within acceptable range.

4. Confirmation of Voltage Analysis Through Testing

Describe plans for verification of voltage analysis methodology (or results of tests already performed).

Verification will consist of voltage measurements taken during the annual ECCS actuation test (using offsite power in the nominal voltage range). Voltages will then be computed under test conditions. Measured and computed voltages will be compared and the computed results shown to be conservative or in reasonable agreement with measured voltages.

5. Review of Design of Degraded Voltage Protection Logic

Re-evaluate the design of the Monticello degraded voltage protection logic. Specifically, determine the feasibility of going to an alternate offsite source on sensing degraded conditions rather than going directly to the diesel generators.

Review the diesel generator starting logic to determine if modifications can be made to reduce the potential for running a diesel for extended periods in an unloaded condition.

If modifications are warranted, provide a description of the design and an implementation schedule for NRC Staff review.

6. Other Modifications or Procedure Changes

Equipment or procedural changes will be proposed, along with implementation dates, if it is concluded that the existing station distribution system design is inadequate in any way. Transformer tap changes, automatic load shedding relays, administrative controls on plant operation with high or low grid voltages, or other changes may be desirable.

7. Technical Specifications

Propose for NRC review and approval a change in the degraded voltage protection logic setpoints if the new analysis indicates a change is desirable.