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Reg. Guide

Mr. Samuel J. Chilk
Secretary of the Commission
U. S. NUCLEAR REGULATORY COMMISSION
Washington, D. C. 20555

Attention: Docketing and Service Branch

Gentlemen:



COMMENTS ON DRAFT REGULATORY GUIDE
LIGHTNING PROTECTION FOR NUCLEAR POWER PLANTS

In August, 1979, the Nuclear Regulatory Commission published and distributed for comment a draft Regulatory Guide entitled, "Lightning Protection for Nuclear Power Plants". We have had this proposed guidance reviewed by personnel in the Wisconsin Electric System Protection Group and offer the following comments:

Page 5, Section C, Paragraph 1

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It is agreed that lightning discharges with peak surge currents of 200kA or greater have occurred. However, it has not been demonstrated that station class surge arresters located in well shielded transmission substations actually discharge currents of this order of magnitude. It would, therefore, seem much more reasonable and consistent with recognized utility engineering practice to follow the ANSI standard of 65kA minimum demonstrated discharge capability. This should not be interpreted as indicating that an arrester cannot handle a 200kA discharge; only that it must be tested to 65kA. Furthermore, failure records for station class surge arresters as kept by Doble and the EEI show very few failures of modern station class arresters which are attributable to lightning. It is, therefore, concluded that the proposal to require arresters with a demonstrated capability of discharging a 200kA - 8 x 20 μ sec. pulse is not consistent with good engineering design principles.

Pages 5 and 6, Section 6, Paragraphs 2.1, 2.2, 2.3, and 2.4

There seems to be no good reason to be as restrictive as these paragraphs are for the application of arresters. The ANSI guidelines, as delineated in C62.2--1969, have proven to be effective and safe. Few, if any, modern arresters applied and

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operated within the guidelines have failed as a result of 60 Hz overvoltages. Furthermore, these paragraphs, as presently written, would dictate much higher insulation levels in switchyard equipment than would be required if arresters were applied in a more conventional manner.

Paragraph 2.4, concerning the application of surge arresters to isolated neutral systems, should be changed to state that arresters so applied should be rated for continuous duty at full-line potential plus some reasonable margin to allow for high system voltage. This section should also be expanded to cover protection for resonant-grounded and high-resistance grounded systems, as these neutral connections are widely applied in power plants to limit single-phase to ground fault currents.

Page 7, Section 6, Paragraph 2.11.1

It is not possible to perform the tests defined in Section 5 of ANSI C62.1--1975 while the surge arrester is in service. These tests would have to be conducted at a manufacturer's test facility. Furthermore, some of the prescribed tests are performed on prorated arrester test sections with results then extrapolated to the entire arrester. The cost of a test facility would otherwise be prohibitive.

We propose that in lieu of the test proposal in Paragraph 2.11.1, power factor tests be performed on a regular basis and that arrester leakage currents be monitored and recorded on a regular basis. The power factor test verifies the integrity of an arrester's sealing system which, in turn, indicates that the pressure relief system is functional. Violent failures are, thus, virtually precluded. The leakage current monitoring and recording would verify that an arrester's grading circuit is intact. It would also be a measure of external arrester contamination. These measures, in conjunction with regular visual inspections, would verify that an arrester will function as intended. Since arresters most often fail in a short circuit mode, while performing their duty -- which is to protect insulation -- the proposed power factor and leakage current tests should be sufficient to verify that adequate surge protection is present.

Comments Regarding the Alternate Proposal Presented as ATTACHMENT A

We are in agreement with the alternate proposal, as it substantially conforms with normally accepted surge protection design practices in the United States.

Concerning Paragraph 6.3 of ATTACHMENT A, caution must be exercised when interpreting surge arrester discharge counter readings. Discharge counters merely count surges; the amount of energy in a

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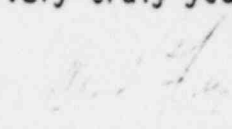
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surge is not measured. Hence, any requirement which might be stipulated in the future concerning arrester replacement after a specified number of surges would have to be considered arbitrary unless some measure of cumulative surge energy is included.

Thank you for this opportunity to comment on the draft Regulatory Guide.

Very truly yours,


C. W. Fay, Director
Nuclear Power Department

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