April 9, 2002

MEMORANDUM TO: File

FROM: Peter J. Kang, Reactor Systems Engineer /***RA***/
License Renewal Section
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

SUBJECT: INDUSTRY DRAFT COMMENTS DATED APRIL 2, 2002 TO PROPOSED STAFF GUIDANCE ON AGING MANAGEMENT OF FIRE PROTECTION SYSTEMS FOR LICENSE RENEWAL

On April 4, 2002, I received an electronic mail from Alan Nelson of NEI transmitting an industry draft comments on "Proposed staff guidance on aging management of fire protection systems for license renewal" dated January 28, 2002. The staff plans on considering this comment for updating the GALL report.

Project No. 690

Attachment: As Stated

cc: PUBLIC

Industry draft comments 4/2/02

NRC Staff Position on Aging Management of Fire Protection Systems

The NRC is making significant increases in the aging management of the fire protection program. This increase goes beyond that currently required by consensus industry standards (e.g., NFPA 25). If the NRC has empirical data or studies to support this increase then that should be shared with NFPA so the information can provided to the entire fire protection community.

There are countless fire protection systems in service for over 50 years in industrial applications. Discussions with sprinkler industry personnel noted that there is no "set" design life for sprinkler systems.

Corrosion is not necessarily uniform throughout a piping network. For example, corrosion has been seen in a specific section of pipe and not seen in adjacent sections of pipe. Corrosion will vary throughout a piping network based on a number of factors such as, orientation of the piping, (vertical/horizontal), type of piping, lining of piping, flow quantity and flow rates through the pipe. The frequency of testing will impact corrosion levels. The type of water used in the fire protection system is also a major factor, (raw water, stored water, treated water). Experience with corrosion related failure has been pinhole type leaks and not catastrophic piping system failures.]

The materials and environments for fire protection piping have a low incidence of corrosion and UT inspections will only result in additional cost with little concurrent technical benefit.

NFPA 25 contains guidance to perform this sampling every 10 years after the initial field service testing. Therefore, the staff is recommending that in addition to an ultrasonic inspection of the fire protection piping before exceeding the current license term, the applicant shall perform ultrasonic inspections [What are the bounds of the test? Will it be up to the licensee to determine the scope of the ultrasonic testing? Can the level of testing be based on prior experience and corrosion factors impacting the piping?] Immediately after the 50-year service life sprinkler head testing and at 10-year intervals thereafter [This requirement is not reasonable. Ultrasonic testing, if performed, should be performed as a part of the licensee's work control process. These inspections should be based on previous maintenance history, and limited in scope to a representative number of locations on a reasonable periodic basis.

[The Staff is using the requirement to test a sampling of sprinkler heads after 50 years of service and an additional sample of sprinkler heads every 10 years thereafter as the basis for the testing of the piping. The NRC needs to explain how the testing of the sprinkler heads can be used as the basis for piping testing. Clearly the NFPA 25 code committee has not made this connection. Does the sprinkler head test consider corrosion or does it primarily test the function of the sprinkler heads?]

As part of the review of this issue and the above stated approach, a concern was raised as to the inspection specifications of the internal surface of below grade FP piping.

[(1) At least one licensee would only do external visual inspections at the incidence of uncovery for specific FP system reasons, or coincident with other maintenance activities. The environmental conditions can provide evidence that corrosion of buried piping is a not a factor.

(2) NDE rather than visual inspection may be necessary for below-grade FP piping.

(3) In many cases, the underground fire protection piping is cement lined, which reduces the potential for internal corrosion. Flow tests performed on the underground piping typically determines the Hazen-Williams "C" factor, which can provide information as to the internal condition of the pipe. Again, there is considerable experience with buried water piping. There are a number of factors that will impact the condition of the piping, (both internally and externally). Extrapolation of the condition of underground piping based on the condition of the aboveground piping may be of only limited value. Typically, underground piping is ductile iron, different from the aboveground carbon steel piping.]

The staff acknowledges that some applicants may be able to demonstrate that the environmental and material conditions that exist on the interior surface of below grade FP piping are similar to the conditions that exist within the interior surface of the above grade FP piping. [What constitutes a satisfactory demonstration?]

The staff needs to state the applicability of these positions to plants whose licenses have already been renewed, and if considered applicable, demonstrate how backfit criteria were satisfied.