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Proposed Revision 14 to Regulatory Guide 1.147

The following comments are in response to the proposed revision 14 to Regulatory Guide 1.147. Specifically, Table 2 lists ASME Code Case N-597-1 as being Conditionally Acceptable. The Code Case addresses evaluation of pipe wall thinning.

In response to industry events and NRC GL 89-08, domestic nuclear utilities established programs to monitor carbon steel piping that is susceptible to flow accelerated corrosion (FAC), formerly referred to as "erosion-corrosion." This has supported the owners' abilities to monitor and proactively replace or upgrade piping components that are thinning, prior to violating Code minimum requirements. Through EPRI's twice yearly meetings, the industry has continued to refine the practices and processes. EPRI NSAC 202L, Recommendations for an Effective Flow-Accelerated Corrosion Program, continues to be updated to stay abreast of issues. There have been no FAC related injuries since the Surry rupture in 1986 at domestic nuclear stations. It is tragic that the Mihama Station in Japan experienced the accident just three weeks ago, but indications are that there were no inspections on a line of similar service to the Surry event, FW Pump Suction. Moreover, they did not utilize the CHECWORKS predictive methodology. This accident appears to have been preventable.

Exelon has a track record of replacing degraded pipe at our 17 nuclear units. Each outage, we conduct NDE tests to assess the pipe wall thinning, and we communicate with the pipe stress analysts to ensure structural integrity of the piping. On occasions we find isolated UT thicknesses over a grid of generally 300 or more UT thickness readings. Through such methods as finite element analysis or Code Case N-597, it can be determined that the localized wear will not cause a loss of integrity for a specified projection of time, based on calculated wear rates. As noted earlier, it is our preference to replace the pipe, and not undergo the expense of detailed localized analysis. In a few cases, it is helpful to recognize the acceptance, in order to more effectively replace the component at an upcoming outage. This allows a more comprehensive assessment of how much piping to replace, as well as optimizing available resources.

I would like to focus on the five conditions associated with use of Code Case N-597:

1.) We are in agreement with the Reg. Guide reference to utilize EPRI NSAC 202L.

2.) This restriction only allows the use for pipe, bends, and elbows. It does not allow the use for other fittings such as reducers or tees. This requirement effectively eliminates the ability to characterize the degraded area delineated in 3622.2 and 3622.3. Therefore, this second requirement negates the usefulness of the Code Case.

3.) The restrictions placed on Class 1 piping in the condition do not even allow the pipe stress analyst to provide an updated minimum wall thickness calculation, which is what our program historically has done

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for every component. This condition indicates that the Class 1 components cannot be below manufacturers tolerances, e.g. 87½% of nominal thickness. This third requirement also negates the usefulness of the Code Case.

4.) We are in agreement that rate of wall thickness must be determined, and it is determined for each examined component. The part of this condition that is a problem is that we only would use the Code Case when the current or projected thickness is below the pipe stress analyst minimum thickness calculation. That is to say, there would be localized thickness indications that are below the calculated minimum thickness. Therefore, the latter portion of this condition makes it impossible to ever use it.

5.) This condition restricts the use of the Code Case to FAC, due to the ability to predict wear rates. While this is helpful to the FAC engineer, if wear rates can be determined for MIC or other degradations, this should be available for those pipe wall thinnings. In either case, the wear rate would be prepared and reviewed by a knowledgeable person in that area. Therefore, we would prefer to be able to use this for any degradation that a wear rate could be calculated for.

In conclusion, I believe that adherence to the guidance of the Code Case is sufficient, and should be included in the Regulatory Guide Table 1, Acceptable Section XI Code Cases. I am a registered professional engineer in North Carolina (Mechanical Discipline) and in Texas. I have worked as a FAC engineer for over thirteen years. I have served on the EPRI CHECWORKS Users Group Advisory Committee over half of this time, and am currently the Exelon Corporate FAC Program Manager. I hope that you will consider my opinion.

Thank you for your consideration,

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