

U.S. Nuclear Regulatory Commission
1717 H Street N.W.
Washington, D.C. 20555

Attention: Mr. Joseph Hendrie

April 9, 1979

Dear Mr. Hendrie:

The recent developments at the Three Mile Island nuclear power plant have caused me to re-consider my work as a mechanical and nuclear engineer at Bechtel Power Corporation between 1968 and 1975. During this time I worked on the design and analysis of mechanical systems of three plants: the Monticello Nuclear Generating Plant in Minnesota, the Trojan Nuclear Plant in Oregon, and the Arkansas Nuclear One, Unit 2 plant near Russellville. I worked on a variety of tasks on these projects, including steam and water system design for balance of plant systems, design and analysis of containment and other safety related systems, and quality assurance work related to reactor and secondary safety systems (Monticello only).

During the course of my work, I became aware of many instances of less than desirable care in design and construction of safety related systems. While many of these items would not be considered serious, a few stand out in my mind as being worthy of your attention, as they may represent serious compromises to the safe operation of these plants.

This letter is intended to alert you of these items, and to aid you in assessing their potential seriousness.

1. On the Monticello plant, a Bechtel construction engineer told me that in order to align pipes for the final weld in the HPCI water line as it connected to one of the feedwater lines (just before it penetrated containment), the pipefitters had to use a 30 ton come-along, which presumably prestressed both lines beyond acceptable levels. He pointed this out to me as an example of less than ideal construction practices which had apparently occurred as a result of extreme pressure to complete the plant on schedule. This did not particularly alarm me at the time, as I was in the midst of discovering that the quality assurance program had largely broken down, and wasn't really able to contend with additional problems. I do remember that he did ask me not to report this matter as he was not wanting to get in trouble for delaying the project at that point. I do not think that it would be possible to determine how much or what kind of prestressing had occurred, as I doubt that any measurements had been taken when it occurred. It would probably make sense, to inspect these welds at increased frequency, and if possible, measure the stresses in the pipes in place. I am not sure which was the last weld in the system, but suspect it was the one between the 14 inch by 8 inch sweepolet (or weldolet) to the 8 inch diameter HPCI line.

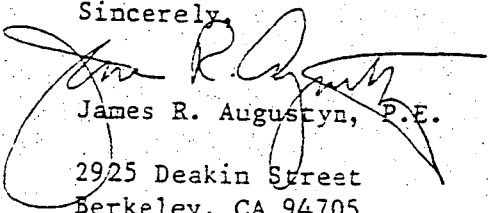
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2. Also at Monticello, I recall that the main steam line containment penetration expansion bellows were installed with some prestressing which was not called for in the design of these components. I did report this to the people at the home office, who thought it was potentially serious. They instructed me to measure the offset so the people who made the components (I think it was Pathway Bellows Co.) could assess the problem. I did this as best I could, and probably came within an inch or two of measuring the actual installed lateral offset. It occurs to me now that there may also have been axial extension or compression, which I did not measure, and had not thought of at the time. I think that the manufacturer later indicated that the offsets were within allowable limits, however I think that these components should be inspected to insure that they are indeed properly installed, as they are potentially of utmost importance. The work done in the "steam chase" area was, I think, on the critical path at the time, and some quality may have been sacrificed for schedule.
3. At both the Arkansas Nuclear One Unit 2 (ANO-2) plant and at Trojan, the post accident containment pressure analysis showed that the maximum containment pressure after the design basis loss of coolant accident was very nearly the design pressure of the respective structures, with little margin of safety. In view of the accident at Three Mile Island, I would think it prudent that you consider the effect of partially or fully melted cores on containment pressure as well as providing a means to allow a controlled pressure relief of these buildings, as their integrity is of utmost importance, especially in the event of a core melt. The very small margin of safety of the pressure capability of the containment buildings in these plants even when faced with a mere design basis accident should be cause for concern, and strict adherence to technical specification limits as related to containment pressure must be enforced.
4. On the ANO-2 plant, I did extensive analysis of the containment spray system, and was always concerned that these systems never receive a fully operational test with water flow through the nozzle arrays. This would not necessarily be a problem, if the systems were carefully designed. However, in my investigations, I discovered at one point that one loop was designed with a high point in the main 8 inch line which, since it was empty before actuation could have resulted in severe water hammer when the system started. This problem was taken quite seriously by my colleagues, and was eventually solved when we were forced to keep these lines full of water at all times to reduce the time from spray system actuation to full flow into containment in order to reduce peak containment pressure after the design basis LOCA. I do not remember the configuration of the ANO-1 spray system piping, and suspect that it may still have this type of a design deficiency, as many of the ANO-2 systems were exact copies of ANO-1 systems even though the reactors were different.

5. In view of Three Mile Island, the ability of the containment spray system to maintain spray water within the correct pH limits seems hardly significant. However my work on the ANO-2 plant led me to discover that the spray system on Unit 1 (a B&W plant) would not deliver spray water of the proper chemical composition under certain normal circumstances. I suspect that you may be aware of this as you began asking questions related to pH as a function of how many safety system pumps were operating while I was working on containment system analysis. If you still maintain that spray system pH must be maintained within strict limits, I suggest you closely review all B&W plants, including ANO-1, as I strongly suspect it defficient in this respect.

If you have questions regarding any of the above, please contact me as I would be most willing to assist you in your evaluation of these items. I no longer work at Bechtel, but may be contacted at my home address below.

Sincerely,



James R. Augustyn, P.E.

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cc: Steve Freedkin