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Sent: Sunday, January 08, 2012 9:33 PM
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Subject: Fukushima-related Comments for 1-8-2012

Good morning,

Tsunami Warning

"Three minutes after the earthquake, the Japan Meteorological Association issued a major tsunami warning, indicating the potential for a tsunami at least 3 meters high." (INPO Report 11-005, page 3) Was this a prediction of the height in the deep water parts of the ocean? If it was, I believe it would be very important to realize that the water wave gets much higher as the (energy?) wave reaches shore. That means that each location on shore, depending upon how its water depth changes, would have different height water waves hitting it. Probably the forces associated with the waves would differ as well. Given the 3 meter warning, what size wave did Fukushima-Daiichi expect? What size wave did Fukushima-Daini expect?

Shore Characteristics for Tsunamis

Do the breakwaters shown on page 2 of INPO Report 11-005, (the North Breakwater, the East Breakwater, and the South Breakwater), decrease or increase the size of tsunami-derived water waves that would hit the powerplant site, compared to no breakwaters at all?

Offsite Transmission Line Reliability

When I was on shift, here is what I would expect from our offsite transmission lines (which the owner of the plant also owned and controlled.) Suppose there was some gusting wind that pushed a couple of transmission line wires momentarily too close together. (A transmission "line" is actually made of 3 wires some distance apart, each carrying 1 of 3 different phases.) The circuit breaker would trip but try to "fast" reclose because, apparently, it is not unusual for line faults to clear quickly. The purpose of fast closure is to reconnect the equipment (such as large motors), before the (electrical) phase angle changed too much, if the condition that caused the fault has cleared. If it didn't clear (in the very short time allowed), the circuit breaker would wait a certain amount of time for the voltage on the now disconnected electrical equipment to decay to about zero, then try again. (Now you have what we would call a "dead bus transfer" because you are supplying electric power to a now-deenergized bus which supplies the circuit breakers protecting each piece of equipment.) Since the zero voltage is below the protective setting on each individual circuit breaker providing electrical power to individual electrical equipment, each has tripped (or disconnected). I believe your operators will have to manually turn each circuit breaker switch to "off" before they can turn the switch to "on" and get those pieces of electrical equipment running again. (This won't happen, of course, if the fault has not cleared.)

Well, that took a while and I could have made some substantial mistakes in these descriptions. The idea is that, even if you lose power due to actuation of protective logic, first off, an attempt is made to restore power before the equipment stops running. Next, there is another attempt but this time the equipment will already have stopped. And, although I didn't say so above, I believe that we had logic to automatically try the dead-bus attempt a second time.

Of course, to have automatic circuit breaker performance like this, you have to spend money (and probably take some lines out of service for short periods of time for calibration and testing of instrumentation/controls.)

Did you notice that we have not read publically that anybody has looked at the reliability of lines supplying Fukushima-Daiichi?

Offsite Transmission Line Diversity

The plant I worked at had power lines arriving on site from two different directions. This one plant had offsite power from the northeast and offsite power from the southwest. (The power we generated left on a different voltage transmission line to the south.) Look at page 2 of INPO Report 11-005. There is only one direction for all three lines to 6 plants.

Did you notice that we have not read publically that anybody has looked at the alignment design of these transmission lines and compared it with, say, any existing transmission line "good practices"?

Extent of Condition

Something you see sometimes when reading US NRC reports is their concern with "extent of condition." For example, if pump "A1" has a particular problem, did you check that redundant pump "A2" does or does not have that same problem? (It makes sense to me to do this.)

At Fukushima-Daiichi, we have heard that they could not, (or did not), check for earthquake damage before the seven tsunami waves struck. Then, there was too much radiation to check Unit 1 and Unit 2 and Unit 3 and Unit 4. How about Unit 5 and Unit 6?

Doesn't it make sense to check for structural damage at Unit 5 and Unit 6? If these later-built plants, at a higher elevation above water level have structural damage, can't it follow that the other 4 certainly do as well?

Thank you,

Tom Gurdziel