

## Epilogue

The commercial nuclear plants at Oconee, Dresden, Quad Cities and Monticello are several examples of reactors that, today, the NRC would never allow to be built in their current locations. The decision to shutter 1970s-vintage reactor plants, that employ thousands of workers and are vitally important to local economies, is a political decision, not a scientific one. However, the risk associated with continuing to operate such facilities is a scientific matter not a political one, and the calculation of that risk should be honestly determined and transparently shared with the public. This is not what is occurring. Instead, the US Nuclear Regulatory Commission has manipulated its risk determinations in order to deflect public scrutiny from its political decisions to allow poorly sited reactors to continue to operate without improving their flooding defenses.

Exelon Corporation has referred to the NRC's post-Fukushima flooding scenarios for Dresden and Quad Cities as "apocalyptic", a term that has colloquially come to mean an extremely rare but devastating natural disaster. It is a term that has been used to describe events such as the flooding in New Orleans during Katrina, the devastation in Joplin following the 2011 tornados, the tsunami that led to the nuclear accidents at Fukushima, etc. Nuclear utilities can dismiss these scenarios as "apocalyptic", but nonetheless the NRC expects US reactor plants and their spent fuel pools to survive such events.

The highest the Mississippi River has ever reached at the location of the Quad Cities reactor site is 586 feet, which is less than [REDACTED] below the plant grade. The highest flood at Dresden was 509 feet which is almost [REDACTED] below the level at which plant safety could be impacted. But these are historical heights based on less than two hundred years of data. What I have not seen shared with the Office of Special Counsel, or with the public, is the predicted frequency of floods that exceed the plant grade at Quad Cities and Dresden. Can they survive the 500-year flood? Has the NRC even analyzed it? If so, where is the document? Is transparency—or the lack of it—of any concern to the US Office of Special Counsel?

Lack of transparency was certainly brought to the attention of the US Office of Special Counsel with regard to the predicted flooding at the Fort Calhoun reactor plant north of Omaha. It is rumored that a study by the US Army Corps of Engineers (USACE) predicted a possible flood height at Fort Calhoun that [REDACTED]. I assume the likelihood of such an event was also discussed in the Corps' report, since when dealing with rare natural disasters it is important to note the actual level of "rarity". But I do not know the likelihood because distribution of this Corps' report has been restricted within the NRC, and both the Corps and the NRC have refused to release the report under the Freedom of Information Act. Why? Why is the public not

allowed to know the flooding hazards that US Army Corps of Engineer dams on the Missouri River posed to Fort Calhoun?

Since 2007 the NRC has been limiting public disclosure of the flooding hazards at the Oconee Nuclear Station because of unspecified security concerns. The rationale is that, since the flooding threat at Oconee is due primarily to the catastrophic failure of the Lake Jocassee Dam, discussion of the flooding concerns at Oconee could make the Lake Jocassee Dam a terrorist target. This was certainly a valid concern in 2007. But, in the ten years since, the NRC has not done a single security study regarding whether or not the Lake Jocassee Dam is adequately protected from hostile action. Nor have we reviewed any security studies done by other organizations (e.g., FERC, Homeland Security, Duke Energy) on the adequacy of the security at the Lake Jocassee Dam. Is the Lake Jocassee Dam adequately guarded against hostile action? Are the regulatory requirements of the Federal Energy Regulatory Commission (the regulatory authority for the Lake Jocassee Dam) adequate to ensure the Lake Jocassee Dam is protected from the same “design basis threat” the NRC requires US reactor plants to be protected against? When destruction of a vital component of infrastructure (such as a dam or gas pipeline) regulated by one agency can affect the viability of a vital component of infrastructure (such as a reactor plant) regulated by another agency, does the Department of Homeland Security have adequate policies, procedures and regulations in place to ensure that threats to the affected infrastructure are addressed? If so, are those requirements being properly implemented to address any security threat that the Lake Jocassee Dam (regulated by FERC) poses to the Oconee Nuclear Station (regulated by the NRC)?

Prior to the reactor accidents at Fukushima, the Oconee/Jocassee issue was being handled as an “adequate protection” issue. That is, in a 2011 safety evaluation the NRC required Duke Energy to show that the reactors at Oconee were protected to a flood height of approximately [REDACTED] (the height of water predicted from a postulated failure of the Lake Jocassee Dam). Following the Fukushima accidents, the NRC transferred handling of the Oconee/Jocassee issue to its Japan Lessons-learned Directorate (JLD). One of the JLD’s tasks was to review the flooding hazards at all 104 US nuclear plants—a monumental task that required aggressive screening of concerns in order to focus limited utility and government resources on the most risk significant issues. At the time the Oconee/Jocassee issue was closed, the JLD was being led by a Director who was actively courting employment with the commercial nuclear industry’s lobbying group (the Nuclear Energy Institute) as well as with several nuclear utilities. It was under his tenure that the Jocassee/Oconee issue was moved to the NRC’s Office of New Reactors, the former staff working on the matter were no longer invited to or told of meetings on the issue, and the newly assigned staff were told that the issue was strictly “need-to-know” and they could only discuss it with their supervisor. The 2011 safety evaluation requiring protection to a flood height of [REDACTED] was never addressed. Instead, an NRO staff scientist accepted a revised flood hazard evaluation by Duke Energy that indicated the existing [REDACTED] floodwall at Oconee was adequate; this was inexplicably

accepted outside of the NRC's normal process for conducting safety evaluations. The NRC has not adequately explained to the OSC why its traditional processes and procedures for addressing adequate protection issues were not completed with regard to the Oconee/Jocassee issue. Why was the 2011 safety evaluation never addressed? If the postulated flood height at Oconee is really less than [REDACTED], why did the NRC not perform a safety evaluation to justify the new flood prediction?

The NRC's tactic regarding the Jocassee/Oconee issue specifically—and the post-Fukushima concerns in general (the earthquake, flooding, etc. re-evaluations conducted after the Fukushima accidents)—has been to parse the issues until the calculated risks are slight enough to be manageable. For example, after NRC scientists determined the overall failure rate of the Lake Jocassee Dam was a probability of one failure every 3600 years, the NRC allowed Duke Energy to ignore failures from extreme rainfall events and from earthquakes. By screening out failures from extreme rainfall (the most likely source of failure) the utility was able to avoid analyzing dam failures that started at higher reservoir capacity and thus produced higher flood levels and quicker dam failures. Many NRC scientists disagreed with this parsing. We feel it was allowed because it enabled Duke Energy to show adequate protection was provided by their existing [REDACTED] floodwall. That is, the parsing of the risks was not good science; it was done to manipulate the scientific results to support the political decision the agency wanted to make.

The Commissioners of the US NRC have the statutory authority to determine that the Oconee Nuclear Station is adequately protected. There is no statutory risk threshold, and we do not question the Commission's authority to weigh the facts and make an adequate protection determination. But as an agency we should be true to scientific principles. Regardless of the political decision, we should properly evaluate all risks to the plant and transparently share our findings with the public. That did not occur with the Oconee/Jocassee issue. We instead screened out the most likely threats to the Lake Jocassee Dam, severely restricted internal access to the final evaluations, and to this day still limit what we share with the public.

There are still many unanswered questions regarding the NRC's handling of flooding issues at nuclear reactor plants. The questions above are examples of threads that can be followed to determine whether or not the NRC is adequately addressing the flooding concerns.