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General Comment

See attached file(s)

Attachments

20160420-sqn-ucs-comments-draft-soarca

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Comments on the NRC's draft technical report titled "State-of-the-Art Reactor Consequences (SOARCA) Project: Sequoyah Integrated Deterministic and Uncertainty Analyses" (March 2016) for the NRC public meeting in Soddy-Daisy, TN

David Lochbaum
Director, Nuclear Safety Project

April 20, 2016

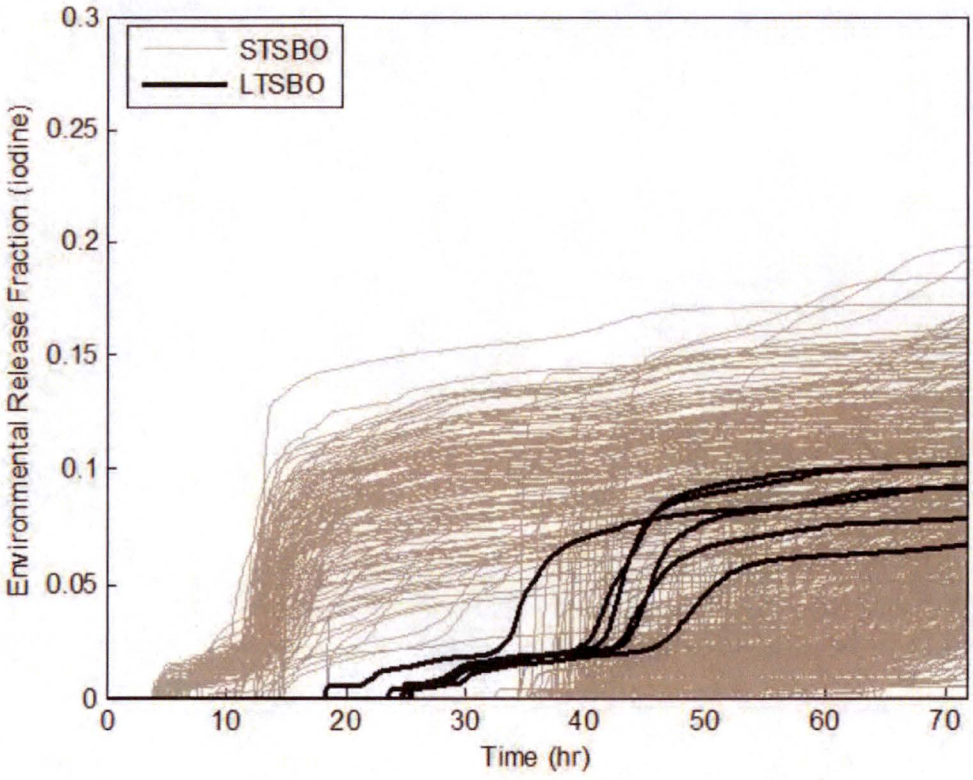


Figure ES-2 Iodine release to the environment for variations of unmitigated STSBO and LTSBO

The draft report considered that a beyond design basis earthquake caused the loss of all alternating current electricity at Sequoyah, an event termed a Station Blackout (SBO). The draft report considered two SBO cases: a long term station blackout (LTSBO) where the turbine-driven auxiliary feedwater pumps provide makeup cooling water for the reactor cores until the batteries powering their control systems deplete, and a short term station blackout (STSBO) where the turbine-driven auxiliary feedwater pumps are not available due to failure of their associated water storage tanks. Each of these two cases is further divided into two parts: a mitigated part where workers are able to successfully deploy portable equipment and take other manual actions so as to prevent overheating damage to the reactor cores, and an unmitigated part where intervention is unsuccessful and damage to the reactor cores occurs with release of radioactivity to the environment.

The draft report concludes that even in the worst case among the scenarios considered (the STSBO with releases occurring in as little as about four hours after the earthquake), there will be very little radiation exposure by members of the public, and therefore minimal harm. The postulated releases of radiation are so high that if people do not evacuate in time, considerable harm can result.

UCS Comment: *The draft report seems unbalanced in that it assumes on one hand that the beyond design basis earthquake causes extensive damage to safety systems at Sequoyah that workers are unable to mitigate, yet on the other hand that this same earthquake causes only limited damage to the infrastructure within the 10-mile emergency planning zone that responders are fully able to mitigate. The final report must redress this imbalance. An overly conservative approach on the reactor side paired up with an overly non-conservative approach on the public protection side is not a prudent policy outcome.*

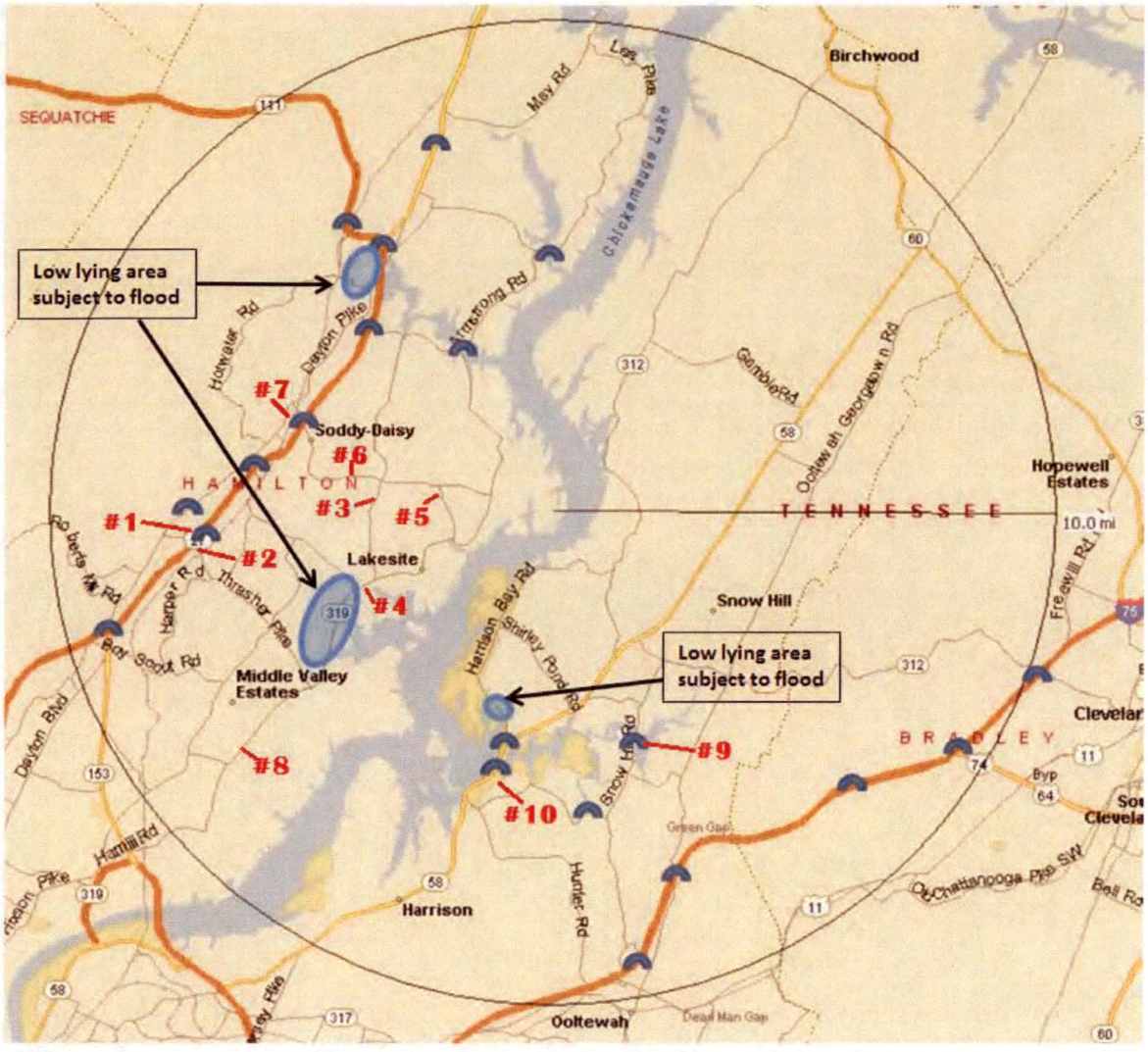


Figure C-1 Assumed bridge failures and low lying areas within the EPZ

NRC Draft Report page xxiv: "Scenarios that are assumed to be initiated by a seismic event consider the earthquake's impact on infrastructure (i.e., loss of bridges)."

UCS Comment: *The draft report considered that the postulated earthquake could damage bridges. But the draft report did not seem to consider other consequences from the postulated earthquake that could equally impact the infrastructure. As many of the pictures clearly show, poles often line one, if not both, sides of roadways. Downed power lines and/or fallen poles could impede evacuation pathways. But the draft report provided neither reasons why the poles/lines would withstand the earthquake's force nor evaluations of potential adverse consequences from downed lines and/or poles.*

NRC Draft Report page C-3: "All bridges within the EPZ were assumed to fail due to the earthquake."

UCS Comment: *The draft report states that all bridges were assumed to fail, but Figure C-1 only shows a subset of all bridges within the EPZ assumed to fail. Pictures #2, #4, #5 and #8 are bridges not shown on*

Figure C-1 and presumably not assumed to fail. Pictures #4 and #8 show bridges on Hixson Pike (Highway 319), a four-lane major artery in the EPZ. If the draft report does not consider the failure of these bridges (which appear similar in age and construction to other bridges like #9 and #10 that are assumed to fail), failure of either bridge during a real event could significantly delay evacuations.

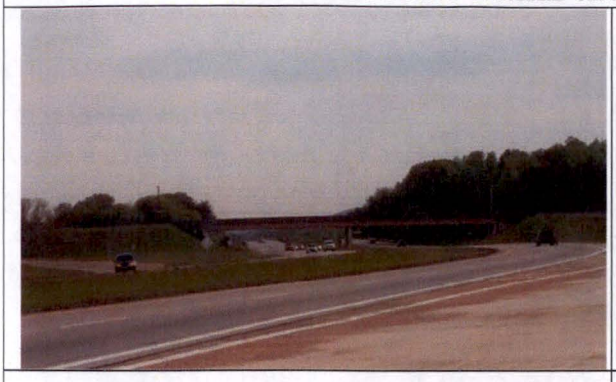
UCS Comment: *Page 2-2 of the draft report applied Nie's seismic fragility derivations for tanks similar to the Condensate Storage Tank at Sequoyah to develop the chances that the tank withstands ground motion of 0.4 g and 0.9 g. The draft report should similarly assess the chances that bridges, poles along roadways, and other key infrastructure elements withstand ground motion from the postulated beyond design basis earthquake. The ability of the infrastructure to accommodate timely evacuation of thousands of individuals is a key factor; the draft report currently treats this key factor in a non-scientific and incomplete manner.*

NRC Draft Report page 5-16: "The earthquake-impacted roadways increase the times required for evacuees to exit the EPZ."

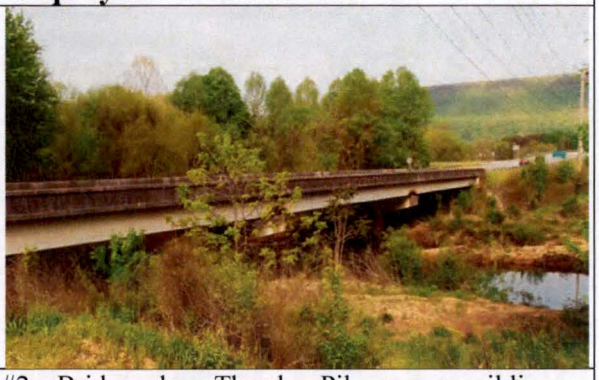
UCS Comment: *We totally agree. Therefore, it is vitally important that the final report properly and fully consider ALL impacts that a beyond design basis earthquake can have on the infrastructure.*

NRC Draft Report page 5-68: "At this time in the event, it is likely local news would broadcast the locations of bridge failures, reducing the time needed for the tail to find their alternative routes."

Infrastructure within the Sequoyah 10-Mile EPZ

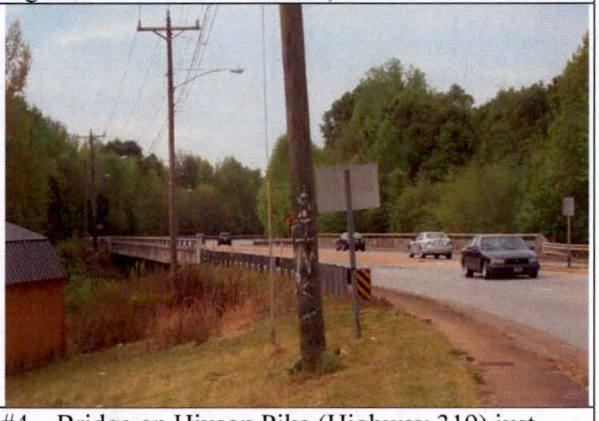


#1 – Thrasher Pike bridge over Highway 27 (shown on Figure C-1 as assumed to fail)

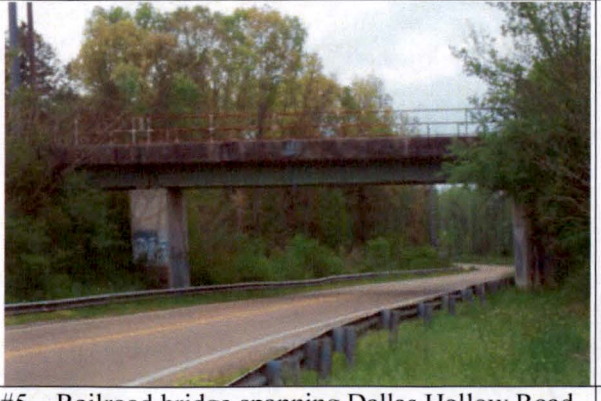


#2 – Bridge where Thrasher Pike crosses rail line east of the Highway 27 intersection (not shown on Figure C-1 as assumed to fail)

#3 – Metal and wood poles on either side of Middle Valley Road (not assumed by the NRC to fall)



#4 – Bridge on Hixson Pike (Highway 319) just southwest of intersection with Middle Valley Road near Hixson High School (not shown on Figure C-1 as assumed to fail)

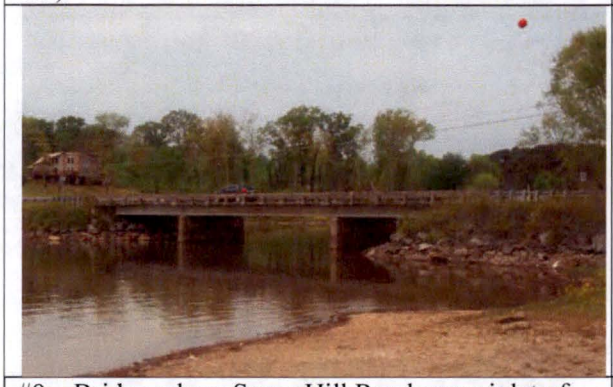


#5 – Railroad bridge spanning Dallas Hollow Road south of the Sequoyah Access Road intersection (not shown on Figure C-1 as assumed to fail)

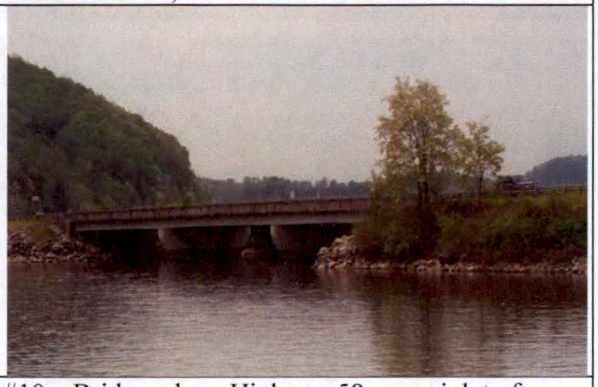
#6 – Resident health care center along Sequoyah Access Road

#7 – Span where Highway 27 crosses the Sequoyah Access Road (shown on Figure C-1 as assumed to fail)

#8 – Bridge where Hixson Pike (Highway 319) crosses rail line (not shown on Figure C-1 as assumed to fail)



#9 – Bridge where Snow Hill Road spans inlet of Chickamauga Lake (shown on Figure C-1 as assumed to fail)



#10 – Bridge where Highway 58 spans inlet of Chickamauga Lake (shown on Figure C-1 as assumed to fail)