

Beasley, Benjamin

From: Beasley, Benjamin
Sent: Wednesday, February 29, 2012 12:40 PM
To: Wilson, George
Cc: Lyon, Fred
Subject: Additional redaction for Watts Bar
Attachments: Pre-GI-009 Watts Bar seciton redacted BGB 2-29-2012.docx

George,

I show the additional redaction for Watts Bar in red in the attached section. I found an old file showing this material redacted so I am not sure what is going on. I am going to review my old documents to confirm that we are not missing something else.

Ben

1.1.1. Watts Bar Nuclear Plant

The maximum assessed flood for Watts Bar Nuclear Plant is caused by the probable maximum precipitation event critically centered on the watershed and results in a flood elevation of 738.8 ft MSL (and 741.2 ft MSL including wave runup).¹ The license indicates that, in the storm contributing to the PMF, "the West Saddle Dike at Watts Bar Dam would be overtopped and breached. No other [dam] failure would occur" (WBNP n.d., p. 2.4-12). The licensee indicates that "all safety related facilities, systems, and equipment are housed in structures which provide flood protection up to plant grade at Elevation 728ft MSL" (WBNP 2010, p. 2.4-8). This elevation is substantially below the design basis flood elevation. Consequently, the plant is required to be shutdown whenever floodwaters exceed this elevation. The licensee indicates that "[f]lood warning criteria and forecasting techniques have been developed to assure that there will always be adequate time to shut the plant down and be ready for floodwaters above plant grade." The licensee also indicates that the facilities, systems, and equipment located in the containment structure (protected by the shield building, which has accesses/penetrations that are watertight) and the Diesel Generator Building (located above critical flood level) are both protected during a flood event. The Turbine, Control, and Auxiliary Buildings will be allowed to flood, but the licensee indicates that equipment required to maintain plant safety during a flood – and for 100 days following the flood – is "designed to operate submerged, is located above the maximum flood level, or otherwise protected" (WBNP 2010, p. 2.4-8).

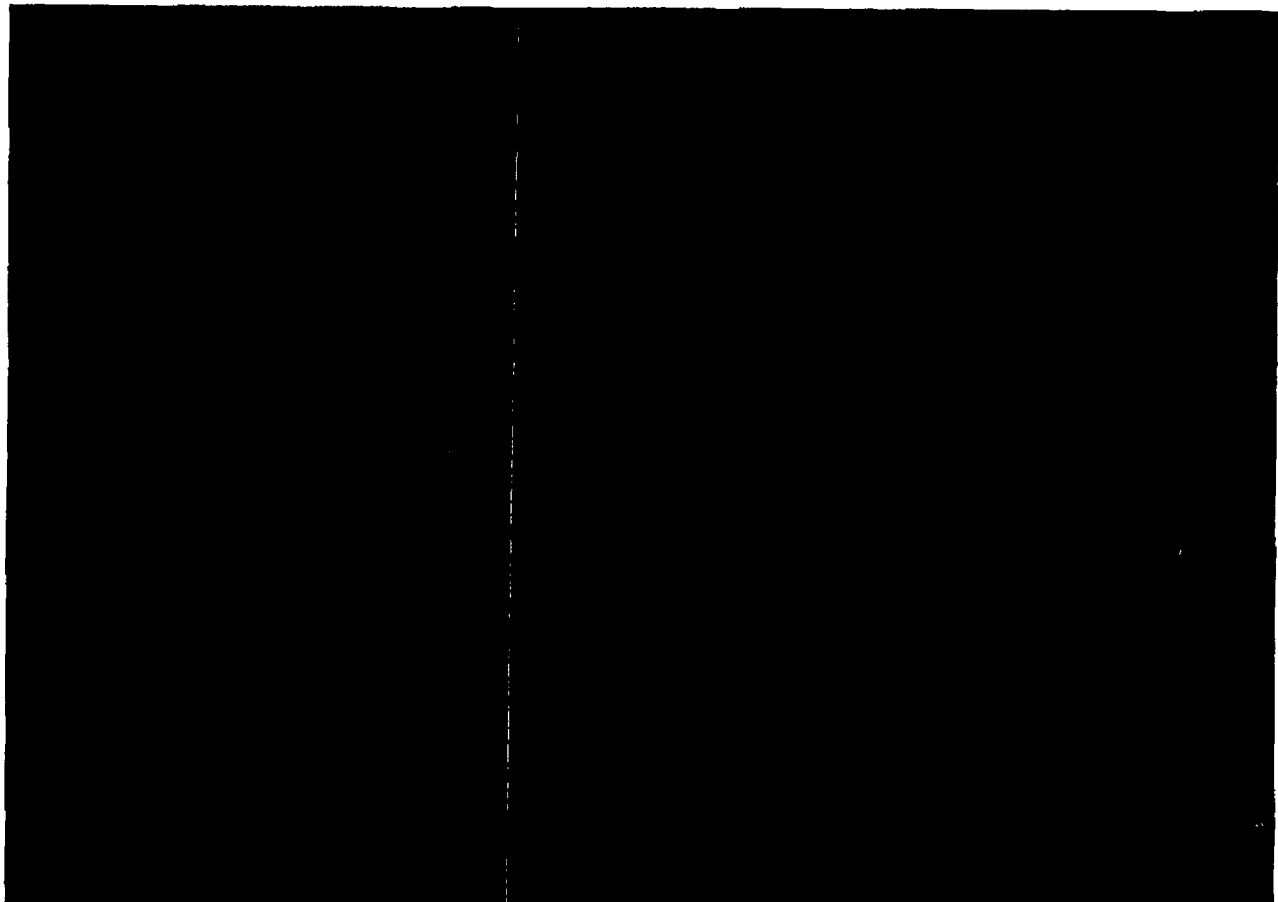
The design basis flood described above does not include an upstream dam failure (other than the overtopping/breach of the West Saddle Dike at Watts Bar Dam) although seismic dam failures coincident with smaller floods were considered in establishing it. The licensee specifies that "dam safety modifications have eliminated the potential of a PMF at upstream tributary dams to cause maximum site flood levels," with the exception of the West Saddle Dike at Watts Bar Dam (WBNP 2010, p. 2.4-12). There are 12 major dams upstream from Watts Bar Nuclear Plant (the locations of six of these dams are shown in Figure 1).

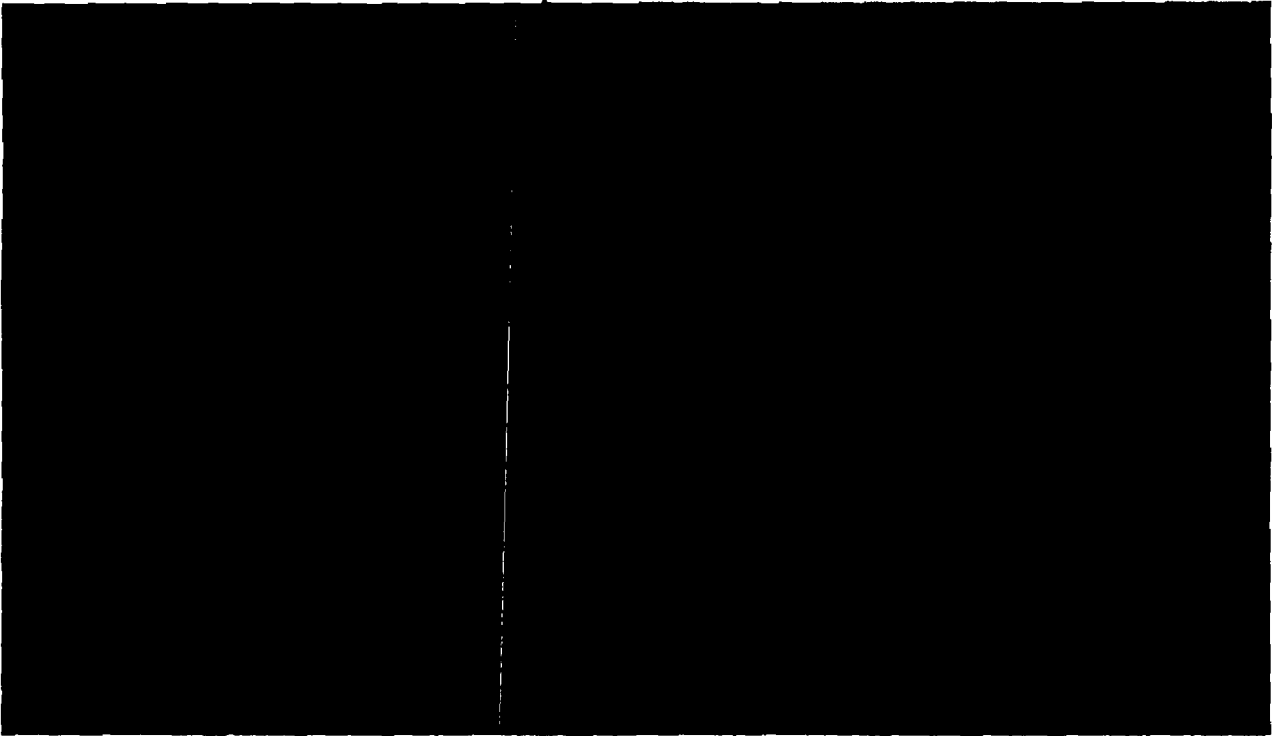
In the plant UFSARs, seismically-induced dam failure is considered under the operating basis earthquake coincident with one-half the PMF as well as during a safe-shutdown earthquake coincident with a 25-year storm. The highest flood elevation at the site, based on several seismic dam failure combinations considered, results in a flood elevation of 727.5 ft MSL (723.2-729.7 ft MSL, including wave runup) caused by failure of the Norris, Cherokee, and Lookout Dams during the safe-shutdown earthquake coincident with a 25-year flood (WBNP 2010, p. 2.4-29, WBNP n.d., p. 2.4-22). Under this event, the West Saddle dike at Watts Bar Dam would be overtopped and breached (WBNP 2010, p. 2.4-38, WBNP n.d., p. 2.4-31). The licensee provides results that indicate arbitrary removal of Watts Bar Dam during a 25-year flood would result in a flood elevation of 723 ft MSL (5 ft below plant grade). In light of the concern about potentially high flood levels at Oconee Nuclear Station resulting from the failure of Jocassee Dam, it may be reasonable to understand the consequences of high flood events at Watts Bar Nuclear Plant resulting from failure of Watts Bar Dam and other upstream dams during an extreme

¹ The FSAR for Unit 2 states "The maximum flood Elevation 738.8 would result from occurrence of the probable maximum storm" (WBNP n.d., p. 2.4-1). The FSAR for Unit 1 states "The maximum flood Elevation 734.9 would result from occurrence of the probable maximum storm" (WBNP 2010, p. 2.4-1). The IPEEE submittal states "The maximum flood level at the site from any cause is elevation 738.1" (WBNP n.d., section 5.6.2). Thus, there is a slight discrepancy between documents with regard to maximum flood estimates.

precipitation event. Watts Bar Nuclear Plant is flood protected up to an elevation of 728ft and requires plant shutdown for flood elevations above this level. [REDACTED]

[REDACTED] The safety-related systems and components necessary for the maintenance of safe shutdown are protected up to the aforementioned design-basis flood level, which does not include a dam failure event (other than the West Saddle Dike at Watts Bar Dam).





Watts Bar Nuclear Plant, Sequoyah Nuclear Plant, and Browns Ferry Nuclear Plant) have resulted in increased PMF elevations that may require permanent modification of flood protection at the sites (pending the outcome of rigorous analyses to verify increases in the PMF elevation). In conjunction with the increases in precipitation-induced flooding, the Tennessee Valley Authority is currently performing finite element analyses to demonstrate dam stability. If analysis results are unfavorable, steps will be taken to modify the dams (USNRC 2010f, TVA 2010).