

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD**

**Before Administrative Judges:
Thomas S. Moore, Chairman
Charles N. Kelber
Peter S. Lam**

**DOCKETED
USNRC**

June 17, 2003 (1:52PM)

**OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF**

In the Matter of)

DUKE COGEMA STONE & WEBSTER)

(Savannah River Mixed Oxide Fuel
Fabrication Facility))

Docket No. 070-03098-ML

ASLBP No. 01-790-01-ML

Unopposed Motion to Narrow Contention 3

Duke Cogema Stone & Webster ("DCS") hereby moves to narrow Georgians Against Nuclear Energy ("GANE") Contention 3, which challenges the design basis earthquake for the Mixed Oxide Fuel Fabrication Facility ("MOX Facility") as discussed in DCS's Construction Authorization Request. DCS has worked with GANE to resolve some of GANE's concerns, and GANE is now able to narrow this Contention. Accordingly, GANE does not oppose this Motion. The NRC Staff also does not oppose the Motion.

Contention 3 identifies information and analyses which GANE believes should have been contained in the original CAR. DCS submitted the CAR to the NRC on February 28, 2001 ("original CAR"). DCS submitted a revised CAR on October 31, 2002 ("revised CAR"). GANE now acknowledges that the revised CAR contains some of the information GANE identified in Contention 3 as lacking in the original CAR.

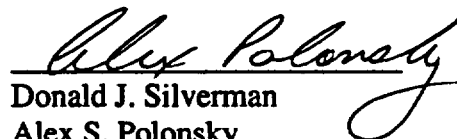
GANE also acknowledges that certain documents that were not previously publicly available, have now been provided to GANE directly through DCS's counsel and through inclusion in the Hearing File, as supplemented by the NRC Staff. These documents have allowed GANE to independently review the information related to the design basis earthquake and resulting response spectra for the MOX Facility.

The revised CAR and the recent availability of documents make portions of the Basis Statement for Contention 3 moot. Accordingly, in agreement with GANE, DCS proposes to narrow Contention 3 by deleting a portion of the Basis Statement. The withdrawn portions are identified by "strike-through" text on the attached document. Since these portions of the Basis Statement are being deleted, there will neither be a need to pursue them during depositions, nor discuss them in written or oral testimony, nor in any other pleading or other document filed with the Licensing Board.

Dated: June 12, 2003

Respectfully submitted,

DUKE COGEMA STONE & WEBSTER



Donald J. Silverman
Alex S. Polonsky
Marjan Mashhadi
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Avenue, N.W.
Washington, DC 20004
Telephone: (202) 739-5502
Facsimile: (202) 739-3001

Contention 3. Inadequate Seismic Design

In Sections 1.3.5 through 1.3.7 of the CAR, DCS specifies the design criteria for the MOX Fuel Fabrication Facility to withstand any potential geological hazard. DCS claims that "conservative design criteria" have been established. *Id.* at 1.3.6-23. This assertion is not supported, because DCS has not performed a seismic analysis that is either adequate in scope or adequately documented.

Basis: The seismic hazard at a site depends on two factors: one, the likelihood of a significant seismic event, and two, the expected site response to such an event. Precisely predicting the likelihood of a future seismic event is not currently possible; the best one can do is extrapolate from past seismicity, compare regional tectonics to those of similar regions, and seek evidence for recent tectonic activity.

The site response depends upon how the local geology, soils, sediments and bedrock, would respond to an expected seismic event, the design basis earthquake. Understanding site response is a rapidly evolving field, and much is being learned as strong motion accelerographs are deployed in areas that experience earthquakes. It is essential, therefore, that any seismic study of the MFFF be complete, accurate and up-to-date.

Likelihood of significant seismic event

In Section 1.3.5, the CAR concludes that "there are no geologic threats affecting the MFFF site, except for the Charleston Seismic Zone and the minor random Piedmont earthquakes." *Id.* at 1.3.5-1. In addition, DCS states that "no conclusive evidence of large prehistoric earthquakes originating outside of coastal South Carolina have been found." CAR at p. 1.3.5-41. These assertions do not consider recent paleoseismic work on the South Carolina Coastal Plain showing more activity in the last 6000 years, and over a wider area, than previously known.

As DCS states at page 1.3-5, excavation and detailed analyses of the "liquefaction flow features" in the area of the 1886 Charleston, South Carolina earthquake provided the "first insight into the pre-history of the Charleston earthquake." On page 1.3.5-41-42 of the CAR, the applicant notes four pre-1886 liquefaction events on the coastal plain linked to Charleston events. A liquefaction episode is caused by ground shaking strong enough for soils to start to flow like a liquid. A strong enough earthquake will leave features

such as sand craters, sand vents and sand fissures, as described in the application. Once located, these relict features can be dated and provide a rough timeline of pre-historic seismic events. However, the features cannot usually be used to pinpoint the earthquake location. DCS claims that paleoliquefaction episodes in areas other than the Charleston coastal plane are not addressed in the literature, and are also unlikely because of the different geology. CAR at 1.3.5-43.

Most regional paleoseismic work has only dealt with events in the Charleston Seismic Zone because liquefaction features were originally located there. A recent paper by Pradeep Talwani and William T. Schaeffer, indicates both that the frequency of major events is higher in the South Carolina Coastal Plain than previously thought, and that major events need not be limited to the Charleston seismic zone. Talwani, et al., Recurrence Rate of Large Earthquakes in the South Carolina Coastal Plain Base on Paleoliquefaction Data, Journal of Geophysical Research, Vol. 106, April 2001, copy attached as Exhibit 5.

The Talwani/Schaeffer study includes liquefaction features along the South Carolina coast and points to two scenarios for paleoseismic activity. One scenario calls for seven magnitude seven (or stronger) Charleston events in the last 6000 years, with a recurrence interval of 600 years. The other scenario would put one magnitude six event near Bluffton, South Carolina, only 100 miles from the SRS, and the others near Charleston and Georgetown. In other words, contrary to what the CAR says, major events may have occurred much closer to the SRS than the Charleston Seismic Zone.

~~DCS claims to evaluate "the relationship between geologic structure and seismic sources within the general site region." However, it is impossible to evaluate the accuracy of this section because of the report's lack of references. Most tables and figures in Section 1.3.6.2 are not referenced to any published work. For those figures that do indicate the source of the information, no citation to a reference document is provided in the list of references (Section 1.3.8). See, for instance, Figure 1.3.6-2 (p. 1.3.6-45), Figure 1.3.6-5 (p. 1.3.6-51), and Figure 1.3.6-10 (p. 1.3.6-61). Other referenced reports are not widely available. For instance, the CAR cites a number of Westinghouse Savannah River Company technical reports that are not available through major university research libraries (e.g., The University of Colorado-Boulder or the Colorado~~

School of Mines). Although the Westinghouse Savannah River Site web site is supposed to have reports on their website, few of the ones listed in the CAR are available. Thus, it is not possible to verify the assertions made in the CAR regarding the MFFF site geology.

Table 1.3.6-1 purports to list "Significant Earthquakes Within 200 Miles of SRS (Intensity > 4 or Magnitude > 3). No references are provided for the sources used to construct Table 1.3.6-1. Thus, they cannot be verified. Moreover, a comparison with the U.S. Geological Survey's Preliminary Determination of Epicenters, Monthly Listing, (URL: http://neic.usgs.gov/neis/epic/epic_global.html) catalog shows that it is inaccurate and incomplete at least for the period from 1974 onwards. For the August 2, 1974, event, the CAR reports a maximum magnitude of 4.3, while the USGS PDE lists a magnitude of 4.9, an energy release four times greater. Table 1 lists other catalogued events within 200 miles of the SRS of magnitude equal to or greater than 3.0 that were omitted in the CAR.

Table 1

Date (yyyy/mm/dd)	Location (Lat N) (Lon E)	Depth (km)	Magnitude	Distance from SRS (km)
1974/10/28	33.79 81.92		3.00 ML	66
1974/11/05	33.73 82.22		3.70 ML	75
1979/08/26	34.93 82.97	2	3.70 UK	223
1986/02/13	34.76 82.94	5	3.50 Mn	205
1987/12/12	34.24 82.63	5	3.00 Mn	143
1988/01/23	32.94 80.16	7	3.30 Mn	145
1995/04/17	32.95 80.07	10	3.90 Mn	153
1998/04/13	34.61 80.47	5	3.90 Mn	190
1998/06/05	35.48 80.82	5	3.20 Mn	262
2000/01/18	32.99 83.21	5	3.50 Mn	144

Between the recent evidence for prehistoric earthquakes and the failure to note all recent regional seismic events, the CAR does not adequately account for the risk of a major event.

Site response

~~The shaking experienced at a particular location during an earthquake is called the "site response." It depends upon a number of factors, including distance to the event, regional geology and topography, and local geology and topography. The CAR cites several site response studies within the SRS, but does not indicate that a quantitative site response study for the MFFF has been done. In section 1.3.5.2, the applicant states, "Subsurface soils at the MFFF site will also be evaluated to determine whether they have any potential for liquefaction," *Id.*, p. 1.3.5-28. and, "the exploration borings, CPT holes, geophysical test results, and laboratory test results will be used to establish static and dynamic geotechnical design criteria," *Id.*, p. 1.3.5-29. Thus, the potential for intense shaking or soil liquefaction at the MFFF site has not been established.~~

~~Moreover, as noted by the NRC staff in its February 28, 2001, request for additional information (RAI) at pages 4-9, the Probabilistic Seismic Hazard Assessment (PSHA) is incomplete. (A copy of the RAI is available on the NRC's MOX website). GANE concurs with the need for clarification on all points mentioned in the RAI.~~

~~In the Standard Review Plan for Review of Final Safety Analysis Reports for Nuclear Power Plants the NRC states that license applicants should develop a site-specific design spectrum. NUREG-0800, Section 2.5.6 (1997). This means that the probability for seismic hazard, that is, the risk of a major event combined with the expected site response, should be expressed as a spectrum of the intensity of shaking at frequencies of structural interest. In the CAR, the applicant asserts that the "MFFF design earthquake is the existing SRS PC-3 spectrum." *Id.*, p. 1.3.6-23. This spectrum is not site-specific, but was computed for the whole of the Savannah River Site in 1997. A site-specific spectrum would include the soil properties determined in the geotechnical studies, such as those presented in Figures 1.3.5-23 through 1.3.5-25. The applicant has not provided detailed methodologies or references for spectral shape changes applied to the starting spectrum.~~

~~In addition, the approach to the PSHA has been insufficiently conservative. In table 1.3.6-7 (p 1.3.6-39), the applicant estimates the return period for $S_a(g)=0.375g$ at 5hz is 2700 years. These estimates are derived from Westinghouse Savannah River Company reports (WSRC-TR-97-0085 and WSRC-TR-98-00263), that are not publicly available. In contrast, the National Seismic Hazard Mapping Project (URL:~~

<http://geohazards.cr.usgs.gov/eq/>) estimates a return period of 1200 years for the same event at the SRS.

CERTIFICATE OF SERVICE

I hereby certify that copies of "Unopposed Motion to Narrow Contention 3" dated June 12, 2003 were served this day upon the persons listed below, by both e-mail and United States Postal Service, first class mail.

Secretary of the Commission*
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
Attn: Rulemakings and Adjudications Staff
(E-mail: HEARINGDOCKET@nrc.gov)

Administrative Judge
Thomas S. Moore, Chairman
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: tsm2@nrc.gov)

Administrative Judge Charles N. Kelber
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: cnk@nrc.gov)

Glenn Carroll
Georgians Against Nuclear Energy
P.O. Box 8574
Atlanta, Georgia 30306
(E-mail: atom.girl@mindspring.com)

Office of Commission Appellate
Adjudication
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: hrb@nrc.gov)

Administrative Judge Peter S. Lam
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: psl@nrc.gov)

Dennis C. Dambly, Esq.
Office of the General Counsel
Mail Stop - O-15 D21
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001
(E-mail: dcd@nrc.gov)

John T. Hull, Esq.
Office of the General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: jth@nrc.gov)

Donald J. Moniak
Blue Ridge Environmental Defense League
P.O. Box 3487
Aiken, S.C. 29802
(E-mail: donmoniak@earthlink.net)

Mitzi A. Young, Esq.
Office of the General Counsel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001
(E-mail: may@nrc.gov)

Diane Curran, Esq.
Harmon, Curran, Spielberg, & Eisenberg, L.L.P.
1726 M Street N.W., Suite 600
Washington, D.C. 20036
(E-mail: dcurran@harmoncurran.com)

Louis Zeller
Blue Ridge Environmental Defense League
PO Box 88
Glendale Springs, N.C. 28629
(E-mail: BREDL@skybest.com)

Cassie E. Bray, Esq.
U.S. Nuclear Regulatory Commission
Office of the General Counsel
Mail Stop: O 15 D21
Washington, D.C. 20555
(E-mail: ceb4@nrc.gov)

* Original and 2 copies



Kimberly A. Harshaw

6/12/03

Date