

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Director of the Office of Nuclear Reactor Regulation

In the Matter of)
DAIRYLAND POWER COOPERATIVE) Docket No. 50-409
(La Crosse Boiling Water) (Show Cause)
Reactor))

LICENSEE'S ANSWER TO
ORDER TO SHOW CAUSE

Pursuant to 10 C.F.R. § 2.02(b), Dairyland Power Cooperative (DPC or Dairyland), the holder of Provisional Operating License No. DPR-45 for the La Crosse Boiling Water Reactor (LACBWR) and the Licensee in the above-referenced proceeding, hereby submits its answer to the Order to Show Cause (Show Cause Order) issued by the Director of the Office of Nuclear Reactor Regulation on February 25, 1980, ^{1/} as follows:

1/ The Order specifically provides that "the licensee may file a written answer within twenty-five (25) days of the date of this Order." Show Cause Order at 9. However, the Order was mailed to Dairyland. Under NRC's Rules of Practice "whenever a party has the right or is required to take some act . . . within a prescribed period after the service of notice . . . upon him . . . and the notice is served upon him by mail, five (5) days shall be added to the prescribed period." 10 C.F.R. § 2.710. This provision governing the computation of time in NRC proceedings applies to show cause proceedings. See 10 C.F.R. § 2.700. Thus, Dairyland was not required to serve its answer (i.e., deposit it in the U.S. mail (10 C.F.R. § 2.712(d)(3)) until March 26, 1980.

Aoo
H
ADD: H DENVER
G FORTER
J MURRAY

1. For the reasons outlined below and set forth in greater detail in the attached "Response To NRC Concerns On Liquefaction Potential At La Crosse Boiling Water Reactor (LACBWR) Site Near Genoa, Vernon County, Wisconsin," dated March 21, 1980, prepared for Dairyland by Dames & Moore in consultation with Dr. H. Bolton Seed (the D&M Response) and the references cited therein, Dairyland disagrees with the NRC Staff's assessment of the liquefaction potential of the soils at the LACBWR site under conditions of seismic stress. Moreover, Dairyland emphatically disagrees with the Staff's observation that a "potentially hazardous condition may exist at the LACBWR site with respect to continued operation of the plant for an extended period of time."^{2/}

^{2/} Show Cause Order at 6. It should be noted that the NRC Staff also concluded that "the general level of seismic hazard at the LACBWR site is sufficiently low that operation of the plant for the next twelve months would not endanger the health and safety of the public" (Show Cause Order at 7). Dairyland believes that the seismic hazard is so low that operation of the plant for a longer period of time would also "not endanger the health and safety of the public." In this regard, the Director recently denied a petition requesting suspension of operation of LACBWR "to the extent that [the] petition requests suspension . . . while the liquefaction issue is being resolved" (emphasis added). Dairyland Power Cooperative (LACBWR), DD-80-9 (Director's Decision Under 10 C.F.R. § 2.206 at 10 (February 29, 1980)).

2. Dairyland admits that the general discussion contained in Part II of the Show Cause Order adequately summarizes the events leading up to the issuance of the Show Cause Order, as well as the positions of the various parties involved in the analysis of the liquefaction issue. However, Dairyland denies each allegation, charge, and/or statement of fact contained in Part II to the extent that it is contrary to the information, data, and conclusions contained in the D&M Response.

3. Dames & Moore submitted a report on September 28, 1979 which demonstrated that the "threshold liquefaction resistance level for the LACBWR site corresponds to a Safe Shutdown Earthquake (SSE) producing an acceleration between 0.18g and 0.20g at the ground surface." Based on its review of the soils data contained in this report, the Staff has concluded that if sustained strong ground motion with peak accelerations of .12g or higher occurs at the LACBWR site, liquefaction can occur down to a depth of 40 feet. The Staff determined that the soil strength curves contained in this D&M report, based on the additional soils samples taken by D&M pursuant to the NRC-approved soils properties investigation program designed to determine the resistance of the soils at the LACBWR site to liquefaction, were "not adequately conservative."^{3/} The Staff then adjusted

^{3/} The bases for this conclusion appear to be the Staff's belief that Dames & Moore (a) did not properly account for the effects of soil densification during sampling and testing, and (b) incorrectly adjusted the N values (i.e., blow counts) from the Standard Penetration Test (SPT) for use in comparison with the empirical correlations between N values and liquefaction at a site in Japan. Show Cause Order at 4-6.

downward the factors of safety against liquefaction which D&M had calculated. This downward adjustment essentially forms the basis for the Show Cause Order.

4. However, neither the September 28 Report nor the NRC Staff's review of that report quantify, or adequately take into account in any other way, the fact that the safety factors against liquefaction which Dames & Moore had originally calculated should actually be increased due to the following considerations:

- (a) the significant increase in density in the soils under the reactor due to the hundreds of closely spaced piles which were driven under the reactor containment vessel and throughout the site area;
- (b) the increase in the lateral coefficient of earth pressure due to the driving of the piles themselves which also increases resistance to liquefaction;
- (c) the counterbalancing effects of structural disturbance and increase in densities of soil resulting from sampling, handling and testing; and
- (d) the D&M technique of minimizing friction by frequently oiling the rope and pulley while performing standard penetration tests which

results in fewer blow counts when compared to the procedures normally used in compiling SPT data for the empirical approach.

5. Accordingly, it is DPC's position (a) that the actual factors of safety against liquefaction under the containment vessel at the LACBWR plant are significantly higher than those presented in the D&M report of September 28, 1979, in which calculations were made for free-field conditions, and (b) that the corrections which the NRC Staff made to the factors of safety presented in the report were inappropriate.

6. In response to the Staff's specific concerns, any density changes which occurred during sampling, freezing, thawing, and consolidating the test specimens on which the September 28 Report was based are more than offset by the fact that these samples (obtained away from driven piles) are less dense by 3 to 6 lb/cu.ft. than the soils under the containment. Moreover, the measured N values used in the September 28 Report should be upgraded to account for the presence of driven piles. Using these upgraded N values in Dr. Seed's empirical approach for correlating N values with liquefaction occurrence, it becomes evident that the soils under the containment vessel at the LACBWR site will not liquefy even upon the occurrence of a magnitude 7.5 earthquake, let alone the other extrapolated magnitude curves recommended by Dr. Seed. Thus, it is Dairyland's position that it is entirely inappropriate and unnecessary to decrease the cyclic

triaxial test strengths to account for the changes in densities pointed out by the NRC Staff or to use average N values. The factors of safety identified in the September 28 Report and the D&M Response are valid and high enough to demonstrate that no measures are necessary to mitigate against the liquefaction potential associated with seismic conditions producing a peak ground acceleration of .12g at the LACBWR site.

7. In any event, the Staff has itself concluded that the general level of seismic hazard is sufficiently low to permit continued operation of LACBWR. This conclusion is based upon the Staff's determination that the return period for an earthquake resulting in a peak acceleration of .12 g "would be at least 1,000 years" and that "the actual return period could be an order of magnitude higher." Show Cause Order at 6-7. The LACBWR site is located in the Central Stable Region where historically the seismic activity is very low. Using seismicity data developed by the TERA Corporation for Lawrence Livermore Laboratory and the NRC, in conjunction with a computer program designed to perform seismic risk analysis, Dames & Moore has determined that the return period for an earthquake of this size is at least 10,000 years and more likely between 10,000 and 100,000 years. The seismic hazard perceived by the Staff is thus low enough to permit continued operation of LACBWR for the anticipated remaining life of the plant. ^{4/}

^{4/} Dairyland's management recently approved plans to phase out the operation of LACBWR by 1990. An amendment to the pending FTOL application which will reflect this development is now being prepared.

8. To summarize the D&M Response, the results of extensive studies and analyses conducted during 1973, 1978, and 1979 pertaining to the geology, seismology, and liquefaction potential of the LACBWR site demonstrate that:

- (a) the predicted SPT blow counts under the containment building are so high that there is no potential for liquefaction, even during a Magnitude 7.5 earthquake, using the empirical approach;
- (b) the estimated cyclic shear strength of the soil under the containment building is sufficiently high to provide an adequate factor of safety against the potential for liquefaction under a peak acceleration of .12g, using the analysis-testing approach;
- (c) the soil conditions throughout the site are more or less uniform, and driven piles are present over much of the site area. The SPT N values, the in-place densities, and the cyclic shear strengths of soils below pile-supported structures other than the containment building are also likely to be higher than the reported free-field values. Thus, the overall margin of safety against potential for liquefaction under an earthquake producing a

peak ground surface acceleration of .12g at the LACBWR site is adequate.

- (d) Seismic activity in the vicinity of the LACBWR site is virtually non-existent.^{5/} The SSE of Intensity VII corresponding to a peak ground surface acceleration of .12g designated by the Staff for the LACBWR plant site is the result of a very conservative interpretation of the historical seismicity of the area within a 200-mile radius of the plant site;
- (e) The seismic risk corresponding to the SSE producing .12g peak ground surface acceleration at the LACBWR site is extremely low. The estimated return period of more than 10,000 years for such an event, when compared with the anticipated remaining life of the plant, provides insufficient grounds for suspending operation of LACBWR at any point during the next decade due to the liquefaction concerns identified by the NRC Staff.

^{5/} As the Director himself noted in his recent Decision Under 10 C.F.R. § 2.206 (see n. 2, supra), "The highest intensity near the site historically was estimated to be Intensity V due to the 1811-1812 New Madrid earthquake, 800 kilometers from the La Crosse site The site is not located near any known localizers of seismicity." Director's Decision at 10.

8. For all the foregoing reasons, Dairyland believes that good cause exists as to why it should not be required to submit a detailed design proposal for a site dewatering system by May 27, 1980 and make such a system operational no later than February 25, 1981.

9. In the event that the Staff does not consider this answer and the attached D&M Response to constitute sufficient cause for not undertaking the steps outlined in the Show Cause Order concerning site dewatering, Dairyland specifically requests a hearing on this matter.

Respectfully submitted,

DAIRYLAND POWER COOPERATIVE

Dated: March 25, 1980

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Director of the Office of Nuclear Reactor Regulation

In the Matter of)
DAIRYLAND POWER COOPERATIVE)
(La Crosse Boiling Water)
Reactor))

Docket No. 50-409
[Show Cause]

AFFIDAVIT

State of Wisconsin: County of Vernon:

POOR ORIGINAL

Frank Linder being first duly sworn, on oath.

says as follows:

1. That he is employed by Dairyland Power Cooperative in the capacity of General Manager.
2. That in this capacity he is duly authorized to execute the foregoing ANSWER on behalf of the Licensee.
3. That the statements made in the foregoing ANSWER are true and correct to the best of his knowledge and belief.

Frank Linder

Frank Linder, General Manager

Subscribed and sworn to before me this 25th day of March, 1980.

Robert Melin
Notary Public, La Crosse County,
Wisconsin.

My commission expires February 26, 1984.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Before the Director of the Office of Nuclear Reactor Regulation

In the Matter of)
DAIRYLAND POWER COOPERATIVE) Docket No. 50-409
(La Crosse Boiling Water) (Show Cause)
Reactor))

CERTIFICATE OF SERVICE

Service has on this day been effected by
personal delivery or first class mail on the following
persons:

Charles Bechhoefer, Esq., Chrm. Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555	Docketing & Service Section Office of the Secretary U.S. Nuclear Regulatory Commission Washington, D.C. 20555
Mr. Ralph S. Decker Route 4 Box 190D Cambridge, Maryland 21613	Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, D.C. 20555
Dr. George C. Anderson Department of Oceanography University of Washington Seattle, Washington 98195	Atomic Safety and Licensing Appeal Board U.S. Nuclear Regulatory Commission Washington, D.C. 20555

Colleen Woodhead, Esquire
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

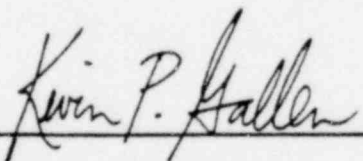
Steve Burns, Esquire
Office of Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Richard Shimshak
Plant Superintendent
Dairyland Power Cooperative
La Crosse Boiling Water Reactor
Genoa, Wisconsin 54632

Fritz Schubert, Esquire
Staff Attorney
Dairyland Power Cooperative
2615 East Avenue, South
La Crosse, Wisconsin 54601

Coulee Region Energy Coalition
P. O. Box 1583
La Crosse, Wisconsin 54601
Attn: Anne Morse

Mr. Harold Denton, Director
Director of Office of Nuclear Reactor
Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555


for O. S. Hiestand

Dated: March 25, 1980



RESPONSE TO NRC CONCERNS
ON LIQUEFACTION POTENTIAL AT
LACROSSE BOILING WATER REACTOR
(LACBWR) SITE NEAR GENOA
VERNON COUNTY, WISCONSIN

DAMES & MOORE