



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FEB 25 1977

MEMORANDUM FOR: J. Carl Stepp, Geosciences Branch, DSE

FROM: R. E. Jackson, Geologist, Geosciences Branch, DSE
John Kelleher, Seismologist, Geosciences Branch, DSE

SUBJECT: OCONEE/JOCASSEE DAM SEISMICITY

On February 15, 1977 we sent a memo to Karl Goller, DOR, requesting a meeting to discuss the geology, seismicity and foundation engineering aspects related to the dam. The utility is evidently unwilling to participate in such a meeting and has requested specific questions on past information that has been submitted. We feel that a meeting of this sort would serve all parties better than a written question and answer sequence.

We proposed a meeting agenda (attached). The meeting would serve several important functions:

1. The data in submitted reports covers only seismic information through June 1976. We have no data for the time since then and we could get an immediate briefing.
2. We have hired Dr. Dave Simpson as a consultant and this would allow his immediate involvement in the problem.
3. Recent discussions with Dr. Pradeep Talwani indicate that when the reservoir was lowered, earthquake activity decreased. Activity has been increasing as the level has been raised. In the past week there have been three felt events, the largest is a magnitude = 2.2
4. A letter from Mr. Parker of Duke Power Company to Mr. Roche of NRC led us to believe that there is a network in operation in the area. Discussion with Dr. Talwani indicates that he has four or five portable stations in the area. They are moved to areas of activity. Duke Power has no control of this instrumentation.

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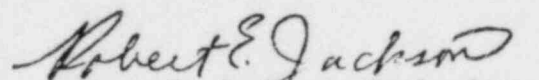
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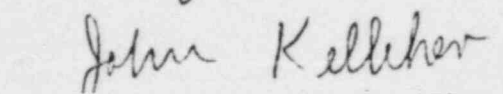
5. Duke Power has informed the staff that Jocassee Dam will see .12g from a magnitude, $M_1=5.6$ earthquake near it. They have provided no basis or supporting information for this position and we are unable to evaluate it.

It is clear that a great deal has happened since submittal of information from Duke Power Company. We feel that many questions need to be answered. A meeting may allow for resolution of some of these questions.

Based on the following considerations, we feel that the issuance of a Show-Cause-Order may be warranted:

- (1) A round of questions will require a substantial amount of time.
- (2) Duke Power Company appears unwilling to voluntarily inform the staff of current earthquake activity in the site vicinity.
- (3) The staff has been under the false impression that Duke Power Company has control of the seismic monitoring.
- (4) Reservoir level changes appear to be effecting seismic behavior.
- (5) The seismicity is aligning in northeast and northwest directions.
- (6) We cannot evaluate the age of last movement or exact location of faults in the area of the dam.
- (7) It is not unreasonable to assume that a magnitude = 6 earthquake could occur in the area of the dam.
- (8) Duke Power Company has not demonstrated to the staff that seismic failure of Jocassee Dam will not cause flooding of the Oconee site.


Robert E. Jackson, Geologist
Geology and Seismology Branch


John V. Kelleher, Seismologist
Geology and Seismology Branch

cc: See next page

J
J. Carl Stepp

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cc: H. Denton
W. Gammill
K. Goller
D. Neighbors
D. Simpson

TENTATIVE DISCUSSION ITEMS
FOR
MEETING WITH DUKE POWER COMPANY
OCONEE/JOCASSEE DAM

1. Geology and Seismology Staff Objectives

2. Specifics of Seismic Network Operation

- a. Station locations
- b. Network capability - magnitude and threshold, distance and depth capability
- c. Discussion of hypocentral activity since July 1976, including focal plane solutions
- d. Reporting procedures to NRC staff

3. Specific Information on Geologic Reconnaissance of Site Area

- a. Location of discovered faulting
- b. Basis of fault age dating
- c. Available photos of dam abutments and foundation
- d. Subsurface geology - models

4. Reservoir-Induced Seismicity

- a. Similarities - difference Jocassee to known damaging earthquakes

5. Seismic Adequacy of Dam

- a. Construction progress photos/airphotos
- b. Groundwater elevation before/after dam filling (time-head plots)
- c. Embankment construction specifications (engineering properties for design and basis, density, gradation for all zones, settlement and alignment of crests and slope as a function of time)

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