

44-101

JUL 01 1987

426.1 AI/87/06/16 87280

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MEMORANDUM FOR: Denwood F. Ross, Deputy Director for Research
Office of Nuclear Regulatory Research

FROM: Robert M. Bernero, Deputy Director
Office of Nuclear Material Safety
and Safeguards

SUBJECT: SUPPORT FOR NRC-AIT AGREEMENT

In response to your memo of June 4, 1987, you will find attached the comments of Dr. A. Ibrahim on the Seismic Hazard Analysis of Taiwan Power Company's Nuclear Power Plant No. 3 at Maanshan. Dr. Ibrahim informed me that some of his concerns which were raised early in a memo to J. Murphy dated June 23, 1986, have not been addressed in the December 10, 1986 report of the Seismic Hazard Analysis. He considers that unless these concerns and those of some of the Project Consultants for the Institute of Earth Sciences (IES) are addressed, the seismic hazard analysis presented is not complete. It is Dr. Ibrahim's judgement that some of the issues raised and not considered in the analyses will have a substantial contribution to the seismic hazard results and consequently on the Probabilistic Risk Assessment.

If you have any questions, please contact Dr. Ibrahim at 74211.

(Signed) Robert M. Bernero

Robert M. Bernero, Deputy Director
Office of Nuclear Material Safety
and Safeguards

Attachment:
As stated

87208588/15
WM Project: WM-
PDR no
(Return to WM, 623-68)

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WM Record File: 414.2
LPDR no

8905240487 870701
PDR WASTE
414.2 PDR

COMMENTS ON THE DECEMBER 10, 1986 REPORT OF MAANSHAN SEISMIC HAZARD ANALYSIS

1. On page 67 of the report it is stated "The extension of the Chaochou Fault was not considered in this hazard calculation." Unless supporting evidences are provided to show that the extension of the Chaochou Fault is not active, the fault extension should be considered in the analysis and its contribution to the seismic hazard should be addressed. Trenching and seismic reflection studies should be considered in order to identify whether the extension of the Chaochou Fault is active or not.
2. The contribution of the subduction zone near the plant to the seismic hazard has not been addressed. Also the possibility of the subduction zone to act as a wave guide to focus the seismic energy towards the plant has not been discussed. Focusing of the seismic energy may lead to larger acceleration than estimated.
3. The report lists the values of upper bound magnitude (M_{Lu}) as estimated from the cumulative strain energy release diagrams. The report should identify and evaluate the uncertainty associated with each of these values.
4. In the meeting held in May 1986, a question was raised about the use of term "shortest distance" in figure 13.1, 13.2 and 13.3 of the May 26, 1986, Progress Report. In the December 10, 1986 report, the term distance is used. Does this distance represent hypocentral, epicentral or the closest distance to the fault rupture?
5. In recent studies of seismic hazard analysis performed in the USA, untruncated seismic hazard curves are used. It is recommended that the same be used for Maanshan site.
6. The method used in assigning the weights in table 5.1 should be discussed, including why the Kanai model is not included.
7. On page 70 of the report it is stated "A lower bound magnitude of $m_0 = 5.0$ appears to be appropriate in this study."
 - a. The word "appears" mentioned in this sentence and in several other places in the text implies the determination is vague.

- b. In a recent-study in the USA (Workshop Proceeding, Engineering Characterization of Small Magnitude Earthquakes, Sponsored by EPRI, January 1987), it is found that changing the lower bound magnitude from 5.0 to 3.75 contributed to about 25% changes in acceleration at 1.0-4 probability of exceedence (See attached tables). Therefore, it is recommended that a lower bound magnitude less than 4.0 be used in the Maanshan study.
8. Other comments in the June 23, 1986 memo to J. Murphy should also be addressed.

Table 3
Results of LLNL Seismic Hazard Calculations¹

Site	Lower Bound Magnitude	Peak Ground Acceleration (g)				
		0.05	0.10	0.20	0.30	0.50
Braidwood	3.75	3.90-3	7.50-4	9.50-5	3.20-5	5.50-6
5.00	1.60-3	3.00-4	5.00-5	1.80-5	3.50-6	
Maine Yankee	3.75	1.01-2	2.40-3	4.00-4	1.40-4	2.80-5
	5.00	5.00-3	1.20-3	2.10-4	8.50-5	2.00-5
River Bend	3.75	1.20-3	2.40-4	3.50-5	1.10-5	2.00-6
	5.00	4.50-4	1.00-4	1.60-5	6.00-6	1.20-6

¹ Hazard values are median estimates scaled from figures in reference 8

From: Workshop Proceedings, Engineering Characterization of Small-Magnitude Earthquakes,
Sponsored By: Electric Power Institute, January 1987.

Table 4
Results of Seismic Hazard Calculations - LLNL Study
PGA Levels For Given Probabilities of Exceedance

Site		Probability of Exceedance	
		1.0-3	1.0-4
Braidwood	3.75	0.09g	0.20g
	5.00	0.06g	0.16g
Maine Yankee	3.75	0.14g	0.34g
	5.00	0.11g	0.29g
River Bend	3.75	0.06g	0.14g
	5.00	<<0.05g	0.10g

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OFFICIAL CONCURRENCE AND DISTRIBUTION RECORD

MEMORANDUM FOR: Denwood F. Ross, Deputy Director for Research
Office of Nuclear Regulatory Research

FROM: Robert M. Bernero, Deputy Director
Office of Nuclear Materials Safety and Safeguards

SUBJECT: SUPPORT FOR NRC-AIT AGREEMENT

DATE:

DISTRIBUTION WM ACTION 87280

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CJenkins (NMSS r/f)	958-SS	JHoffman	HWatts
958-SS			

CONCURRENCES

ORGANIZATION/CONCUREE	INITIALS	DATE CONCURRED
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(Mailed by the WMDCC)

79813
Date / Time

FROM Ross, RES	DATE OF DOCUMENT 6/4/87	DATE RECEIVED 6/11/87	NO MM-87280	
	LTR	MEMO XX	DRT	OTHER
TO RBernero	ORIG.	CC XX	OTHER	
	ACTION NECESSARY <input checked="" type="checkbox"/>	CONCURRENCE <input type="checkbox"/>	DATE ANSWERED 6/25	
	NO ACTION NECESSARY <input type="checkbox"/>	COMMENT <input type="checkbox"/>	BY	
CLASSIF	POST OFFICE	FILE CODE 412		
	REG. NO			
DESCRIPTION (Must Be Unclassified) Support for NRC-AIT Agreement	REFERRED TO	DATE	RECEIVED BY	DATE
	RBallard	6/11	<i>(Signature)</i>	6/15
	Albrahim			
ENCLOSURES				
Ticket close out with letter to Denwood F. Ross from Albrahim on 87/07/01.				
REMARKS <i>Logged in by ef 6/12</i>				