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MEMORANDUM FOR: William H. Regan, Jr., Chief, Environmental Projects Branch No. 2, DSE

FROM: Donald P. Cleary, Section Leader, Regional Impact Analysis Section, Cost-Benefit Analysis Branch, ST, DSE

SUBJECT: DRAFT TESTIMONY FOR THREE MILE ISLAND, UNIT 2

PLANT NAME: Three Mile Island, Unit 2
LICENSING STAGE: OL
DOCKET NUMBER: 50-320
RESPONSIBLE BRANCH: Environmental Projects No. 2
PROJECT MANAGER: Jan Norris
DESCRIPTION OF RESPONSE: Draft Testimony

Attached is the draft testimony in relation to Contention 3 dealing with cooling towers design adequacy related to earthquakes and tornadoes.

The attachment was prepared by Louis Bykoski, Cost Benefit Analysis Branch, 492-7906. Please forward a copy of the attachment to OELD.

Donald P. Cleary, Section Leader
Regional Impact Analysis Section
Cost-Benefit Analysis Branch
Division of Site Safety and
Environmental Analysis

Attachment: As stated

cc: J. Norris
B. J. Youngblood
L. Bykoski

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SURNAME	DCleary	BJYoungblood				
DATE	1-26-77	1-26-77				

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
GPU SERVICE CORPORATION	)	Docket No. 50-320
	)	
(Three Mile Island Nuclear Station, Unit 2)	)	
	)	
	)	

NUCLEAR REGULATORY COMMISSION STAFF'S TESTIMONY ON CONTENTION 3

by
Louis Bykoski

This testimony addresses Contention 3 which states:

> "The design for the cooling towers is inadequate to withstand the earthquake or tornado that the rest of the plant is built to withstand. As a result, if this earthquake or tornado does occur and the main plant does withstand it, it is highly probable that the cooling towers will not. Then, either the plant will shut down for two or three years while the towers are rebuilt or repaired, or the plant will continue to operate without cooling towers using once-through cooling. In this latter event, it is highly likely that state water quality criteria would be violated and severe environmental impacts would ensue. Therefore, no operating license should be granted until the entire plant is rendered capable of withstanding the maximum anticipated earthquake or tornado or until an adequate cost-benefit analysis pursuant to NEPA is conducted taking into account the impact of possible loss of the cooling towers."

The plant, as it is designed, is physically incapable of operating a once-through cooling system. Therefore, the plant will not operate in violation of state water quality criteria as a result of once-through cooling.

The contention assumes that all plant systems and structures other than the cooling towers are designed to withstand earthquakes and tornadoes. In fact, only those plant systems and structures which are necessary to shut the plant down safely and maintain it in a safe shutdown condition are designed to withstand tornadoes and a level of seismic shaking called the Safe Shutdown Earthquake.

These strigent design requirements against the effects of natural phenomena are required by NRC to protect the health and safety of the public. The remaining systems and structures, including the cooling towers, are not specified by NRC regulations with regard to effects of natural phenomena. Plant features not included in the health and

safety category are designed by the applicant to be cost effective and to meet any building codes as may be required by state and local regulations. The same conditions would exist for any alternative energy source plant at the same site.

If one were to consider the loss of cooling towers at the site sometime during the lifetime of the plant, this would only change the lifetime capacity factor of the plant from an assumed 70% to about 65%. However, it is important to realize that this same reduction in capacity factor would occur if a fossil plant were located at that site. It should be further realized that the probability of occurrence of natural phenomena sufficient to cause such damage is lower than the assumed 100 percent probability, thus, the actual probalistic reduction in capacity factor due to the effects of natural phenomena on the cooling towers would be even lower than the five percentage points calculated. In addition to the above points, it must be remembered that there are portions of the plant other than cooling towers that also are not designed to NRC seismic and wind loading safety criteria, such as the turbine, main condensor, turbine building, switchyard, and transmission lines. Thus, the design of cooling towers to more stringent requirements would not substantially improve the ability of the entire plant and transmission system to withstand severe natural phenomena. Also, since statistical information on capacity factors inherently includes the impacts of such natural phenomena, it is clear that to reduce the value of the anticipated capacity factor further because of this postulated impact would be improper.