

October 25, 1973

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

Before the Atomic Safety and Licensing Board

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| In the Matter of |) | |
| |) | |
| METROPOLITAN EDISON |) | Docket No. 50-289 |
| COMPANY, et al. |) | |
| |) | |
| (Three Mile Island Nuclear |) | |
| Station, Unit 1) |) | |

APPLICANTS' PREPARED TESTIMONY
RELATED TO
FLOOD PROTECTION

Three Mile Island's (TMI's) dike design (1,100,000 cfs) is greater than the maximum floods of record, including Agnes in 1972 (1,000,000 cfs). For floods up to the Probable Maximum Flood (1,625,000 cfs), TMI is provided with additional protection by flood gates, inflatable door seals, watertight doors and manway covers, assuring the ability to shutdown and cooldown the plant and maintain it in a safe shutdown condition.

A summary of the flow characteristics of the Susquehanna River as evidenced by data recorded at Harrisburg through 1965 revealed a river average flow of 34,000 cfs, a mean annual flood of 300,000 cfs, and a maximum flood on March 19, 1936 of 740,000 cfs. Based upon this 1891-1965

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data, the Corps of Engineers' estimate in 1965 was that the Probable Maximum Flood (PMF) for the Susquehanna River would produce a flow rate of 1,083,000 cfs (150% of the 1936 maximum flood of record). This flood, upon which TMI's dike design was based, corresponded to a flow rate of 1,100,000 cfs of the Susquehanna River at TMI.

During the five years since TMI's dike design was finalized, there have been two related developments. Based upon revised criteria, the Corps of Engineers in 1970, estimated PMF for the Susquehanna River would produce a flow rate of 1,625,000 cfs at TMI. On June 24, 1972, rains from tropical storm Agnes resulted in a flood volume of 1,000,000 cfs. Thus, while the Corps of Engineers' PMF has been revised to a value above the original design flood, neither the 1936 flood of record nor the 1972 flood were in excess of the design flood of 1,100,000 cfs.

The dikes around TMI are earth embankments, constructed of clay and silt and designed in accordance with sound Civil Engineering practices. The dike at the north end of the island has a top elevation of 310'. The dikes on the east and west sides of the island start at a top elevation of 310' at the north end and steadily decline to 305' at the south end.

The dikes are protected by a layer of dumped rip rap of sufficient size and thickness to withstand wave action of

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2 1/2 feet and a velocity in excess of 12 fps. The rip rap continues downward into natural ground for a minimum depth of 2 feet to provide a cut off against undermining.

To insure that the dikes maintain their integrity, the technical specification will require periodic inspection of the dikes at least every six months and after the river returns to normal should the level of the river exceed flood stage.

The dikes were constructed to be capable of providing adequate protection for a design flood in which the flow rate of the Susquehanna River at TMI would reach 1,100,000 cfs. If this size flood were to occur, the water elevation at the north end of the island would be 304'. This would provide a freeboard of approximately 6' above the design flood. The water level would be 303' at the intake structure while the dike in this area is at 305' leaving about 2' of freeboard above the design flood.

In addition to these dikes and because of the difference between the plant design flood and the PMF, a commitment has been made to the AEC that the plant would be provided with component protection to the degree which will assure a safe and orderly shutdown for the level of flooding corresponding to the PMF.

In the event of flood flows greater than the design flood up to and including flows of 1,645,000 cfs (PMF), protection of all equipment necessary to shutdown and cool-down of the plant and to maintain it in a shutdown condition

is provided by flood gates, inflatable door seals, water tight doors and manway covers.

To insure that the TMI commitment to the AEC is met, an emergency procedure has been written and a Technical Specification has been provided which requires the unit to be brought to the hot shutdown condition if the river stage reaches elevation 302' at the river water intake structure, corresponding to 1,000,000 cfs river flow. There are four (4) action levels prior to the shutdown action level with specific actions taken at each level which will assure proper component protection to the degree a safe and orderly shutdown can be performed if required.

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