NRC PDR
(Docket 50-32

Department of Energy
Washington, D.C. 20585

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Mr. William J. Dircks
Acting Executive Director for Operations
U.S. Nuclear Regulatory Commission (MNBD)
Washington, D. C. 20555

Dear Mr. Dircks:

At the request of the Chairman of the Nuclear Regulatory Commission (NRC), the Department of Energy (DOE) is conducting a program in cooperation with NRC and the Electric Power Research Institute (EPRI), aimed at learning as much as possible from an examination of Three Mile Island Unit 2 (TMI-2) plant and equipment. This program was endorsed by the President in his December 7, 1979 message responding to the Kemeny Commission report. In connection with DOE efforts to plan and conduct this program, I have become aware of the need to gain prompt access to the reactor system and core in order to replace monitoring instrumentation and to begin the process of defueling at the earliest possible time. The increased knowledge and control of reactor conditions that would be gained by such prompt access is an important element in NRC's and the General Public Utility's (GPU) mutual objectives of assuring the continued safety of workers and the surrounding public. Such access is today precluded by the existence of radioactive gas in the containment, the removal of which is currently under evaluation by the NRC.

I understand that the owner, GPU Company, has evaluated alternative methods of removing the gas, and has concluded that a controlled purging which meets all Federal regulations is the most acceptable alternative from a public health standpoint. GPU has requested NRC approval of that course of action in a letter dated November 13, 1979, and that NRC has the GPU recommendation under active consideration. My staff has performed an independent review of the matter, and has concluded that a controlled purging is indeed the preferred method. It would result in less public radiation exposure than accrues from many other power plants, both nuclear and fossil. The purpose of this letter is to urge the Commission to act promptly on the matter, and in the event of NRC approval, to offer the resources of the Department of Energy to assist in monitoring off-site conditions during the purging process to help guarantee that conditions remain within acceptable limits. The basis for the DOE conclusion on purging is explained in the enclosure.

Sincerely,

G. W. Cunningham
Assistant Secretary
for Nuclear Energy

Enclosure

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DOE REVIEW OF GPU RECOMMENDATION OF TMI-2 CONTAINMENT PURGING

There are at present about 44,000 curies of Krypton-85 gas in the TMI-2 containment at a concentration of about three-fourths microcurie per cubic centimeter. The GPU Company has requested approval to purge this to the atmosphere from the plant stack at rates which are permissable within current Federal regulations and which would be monitored to assure exposure to personnel is well within acceptable limits. The purging would be done over a period of 30 days or more and would be done only when favorable weather conditions are present. The alternatives to controlled purging are:

1) Maintain containment isolation while designing, constructing, and installing new systems to separate and isolate the Krypton gas from the containment atmosphere. Complete functional systems to accomplish this separation at TMI are not presently available. DOE laboratories have estimated it would take at least two years to build one such system. We believe that the actual time including licensing would be longer, even with a crash program. Furthermore, subsequent storage and transportation of the separated Krypton would pose significant radiological risk to workers and the public.

2) Maintain containment isolation while gas storage tanks are constructed, and then, using compressors, pump the entire containment atmosphere into these tanks. This storage option would require more than twenty-five miles of thirty-six inch dimension pipe (filled to a pressure 340 psig), would take at least two years to procure, test and install, and would have to be housed in large buildings designed to provide adequate environmental protection to the storage tanks.

3) Maintain containment isolation until the Krypton gas decays to lower radiation levels. The half life is 10.5 years. Thus, several decades of storage would be required.

Each of these alternatives creates two principal difficulties which, we believe, make them impractical and unsafe.

First, they involve a lengthy delay in gaining access to the inside of the TMI-2 containment to begin assessment, cleanup and defueling operations on the reactor plant. Such operations cannot be safely conducted with the Krypton gas present. Access for work is urgently needed to assure that the reactor system continues to be maintained in a safe condition. The instruments which monitor the nuclear and thermodynamic condition of the reactor core have been unattended, in a high humidity atmosphere, for over 10 months. It is prudent and important for safety to replace these instruments with new and reliable instrumentation and controls as soon as possible. It is also prudent to gain access to the reactor plant and

core in order to determine its configuration and to plan and implement the defueling operation at the earliest possible time. Delay in achieving the control that would result from these actions increases the risk to worker and public safety.

Second, the delay associated with each of these alternatives increases the likelihood of uncontrolled release of Krypton gas to the environment. Such releases, because they could occur at or near ground level (rather than from a 160 foot high stack) and because they may occur under favorable weather conditions, could cause higher radiation exposures than would the controlled purging. Such release could occur if, for example, the containment building atmospheric cooling equipment, which has been operating for 10 months unattended, should develop a failure. This could happen at any time, considering the extreme humidity conditions inside containment. Failure of this cooling equipment would permit internal containment pressure to increase slightly thus leading to small leakage which, although within containment leakage specification limits, has thus far been prevented by keeping the containment below atmospheric pressure.

The proposed purging process is within all operable rules and regulations and is practiced by other operating utilities with no adverse effect on public health and the environment. A review of available NRC records reveals over 70 cases during the period 1971 through 1977 in which the annual discharge from a single nuclear power plant exceeded 44,000 curies per year of noble gas. Furthermore, studies conducted by the Oak Ridge National Laboratory indicates that the total integrated population exposure from discharge of radioactivity from a modern, high efficiency coal plant would be on the order of 1.2 to 11 person-rem/year. This compares to the estimated total integrated population exposure within 50 miles of TMI of about 1 person-rem as a result of purging. For comparison, naturally occurring radiation exposes the same population to over 200,000 person-rem every year.

In the interest of safety, we conclude that the "prudent man" decision would be to approve the controlled purging of Krypton gas from the TMI-2 containment.