Enclosure 4

Response to Congressman Mottl's statement that "The short history of our operation of nuclear power stations has been replete with malfunctions of the safety-related systems. Luckily, the public has not yet been subjected to a catastrophic accident."

There has been a continuing evolution of the nuclear industry during the fifteen years that nuclear power plants have been in commercial operation. (The Dresden 1 plant began commercial operation in 1960.) Many advances in technology, engineering, and science have affected the regulatory process as well as the power plants licensed to operate. Today, 47 nuclear power plants are in commercial operation (another 7 are licensed to commence operation). Through the years, the additional plants increased in size and complexity to meet changing requirements and standards. However, during the entire history of the commercial use, the protection of the public health and safety has been the foremost priority and goal of the Federal government and the industry.

The Nuclear Regulatory Commission uses a philosophy of "defense in depth" to assure the protection of the public health and safety. This philosophy combines the principles of redundancy (multiple systems to perform the same function) and diversity (different methods of accomplishing the same function) with systematic requirements and control of the design, manufacture, construction, testing, operation, and corrective (or following) actions of nuclear power plants.

Multiple failures or malfunctions of safety systems or components can be tolerated because of a number of redundant systems or components designed to and capable of performing the same function or because of different types or methods of accomplishing the same function. The great majority of malfunctions reported to the NRC concern single malfunction of components or parts of systems, with redundant components or systems operable and capable of performing desired functions. In cases where entire systems were inoperable, redundant or diverse systems were usually available.

One of these systematic procedures for regulating the industry has been to have the licensees report malfunctions of safety-related equipment to the NRC. The NRC evaluates each event to determine the safety implications involved. Because of the broad scope and low threshold of the reporting system, there appears to be a large number of reportable events per nuclear power plant. However, it is noted that the majority of reports received from licensees

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a. are minor in nature (with respect to having an impact on pu. ic health or safety),

b. are discovered ring the routine periodic testing of the plant systems and components, and

c. are correctable immediately upon discovery.

Thus, the reporting of a relatively large number of licensee events does not necessarily reflect increased probability of adverse impact on the health and safety of the public.

When an event is determined to have the potential for an impact on public health or safety, prompt action is required by the licensee to prevent actual impact from occurring.

Thus, it is not luck but conscious, determined, and regulated planning and management attention throughout the nuclear industry and multiple levels of protection that prevent events at nuclear power plants from having an actual adverse impact on public health and safety. The probability of a catastrophic accident remains very low because of this process.

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Enclosure 5

Response to Congressman Mottl's statement that "It must be stressed that a large nuclear reactor accumulates an enormous amount of dangerous and highly toxic materials during normal operation, roughly 1-1/2 tons of such material, nearly one-fifth of which is gaseous or volatile. The detonation of the nuclear weapon over Hiroshima produced only about two pounds of these materials."

There is little basis for making a comparison between the radioactivity that is generated during normal operation within a nuclear reactor and the radioactivity generated by the detonation of a nuclear weapon. In the case of a nuclear weapon, the radioactive materials are rapidly dispersed into the atmosphere. In the case of a nuclear reactor, the radioactive materials, the amount of which depends upon the length of time and the power level at which the nuclear reactor is operated, are contained within sealed fuel elements. Multiple barriers are provided to prevent the escape of radioactive materials into the atmosphere, from whatever causes. The nuclear power plant is designed to withstand severe natural forces, such as earthquakes and tornadoes, as well as severe hypothetical accidents that are postulated to occur, without compromising the barriers in a manner that would endanger public health and safety.

Even in the case of a severe accident in which all the safeguards fail to work, such as a loss-of-coolant accident for which the emergency core cooling system fails to operate and the core melts down, it has been estimated (see WASH-1400, "An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," issued in draft form, August 1974) that there would be on the average, less than one fatality and about $100,000 of property damage. The probability of such a core meltdown accident has been estimated to be on the average of one every 17,000 years per plant.

Therefore, we see that even if the most severe nuclear power plant accident would occur, resulting in a core meltdown, the impact on public health and safety would be many orders of magnitude less severe than that resulting from the detonation of a nuclear weapon.

The nuclear inspection activities are pyramidal with each layer of activity inspected or audited by the one above. The NRC's controlling position is at the apex while the great bulk of the inspection activity is performed by industry beneath this apex.

The NRC's inspections are directed primarily at determining that the licensee's quality assurance program is implemented and effective. This is done by a series of periodic, preplanned, onsite inspections conducted by teams usually of one to three inspectors. On a sampling basis they observe work performance, interview employees, and review records. As described in Enclosure 1, NRC's Office of Inspection and Enforcement found that the problems at Davis-Besse Unit 1 resulted from the failure in the implementation of the Company's quality assurance program in this area by relying too heavily on its contractors and subcontractors for quality assurance inspection without providing an adequate audit. Steps have been taken to correct this failure.

In general, following each inspection, the licensee is notified of any apparent failures to meet commitments contained in the application or in correspondence to the NRC and of deviations from appropriate codes, standards, and regulatory guides. Resolution is necessary, prior to licensing for operation of the reactor, of all deviations identified.

As described in Enclosure 1, NRC's Office of Inspection and Enforcement has intensified its inspection effort at Davis-Besse Unit 1 because of the quality assurance problems identified there. More frequent NRC inspections have been scheduled to review the Company's control of safety-related construction work. One such inspection was made in late July to check safety-related piping. The inspection team did not find any significant deficiencies in the piping work.

The situation at Davis-Besse demonstrates that the existing inspection program of NRC does identify and bring about correction of quality assurance problems. The NRC currently has underway a study of its inspection program. The study will examine the adequacy of the inspection program consistent with statutory requirements and resource availability.

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Enclosure 6

Response to Congressman Mottl's statement that "I wish ... to urge more stringent inspections of this plant, the projected Perry nuclear complex and all nuclear power plants under construction."

The Office of Inspection and Enforcement believes existing NRC requirements are sufficient to assure that the nuclear power plants under construction will be able to operate without undue risk to the health and safety of plant personnel and the general public.

The nuclear facility licensing and inspection program rests on the premise that the licensee is basically responsible for the proper construction and safe operation of the nuclear power plant. The total system for the inspection of nuclear facilities - involving both industry and government - provides for multiple levels of inspection and audit. Requirements for licensees inspections and audits as contained in the NRC's regulations includes the following:

> "A program for inspection of activities affecting quality shall be established and executed by or for the organization performing the activity to verify conformance with the documented instructions, procedures, and drawings for accomplishing the activity. Such inspection shall be performed by individuals other than those who performed the activity being inspected. Examinations, measurements, or tests of material or products processed shall be performed for each work operation where necessary to assure quality. If inspection of processed material or products is impossible or disadvantageous, indirect control by monitoring processing methods, equipment, and personnel shall be provided. Both inspection and process monitoring shall be provided when control is inadequate without both. If mandatory inspection hold points, which require witnessing or inspecting by the applicant's designated representative and beyond which work shall not proceed without the consent of its designated representative are required, the specific hold points shall be indicated in appropriate documents."
>
> "A comprehensive system of planned and periodic audits shall be carried out to verify compliance with all aspects of the quality assurance program and to determine the effectiveness of the program. The audits shall be performed in accordance with the written procedures or check lists by appropriately trained personnel not having direct responsibilities in the areas being audited. Audit results shall be documented and reviewed by management having responsibility in the area audited. Followup action, including reaudit of deficient areas, shall be taken where indicated."

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