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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

LICENSEE'S TESTIMONY OF

WILLIAM S. LEE REGARDING

CLI-80-5, ISSUE (10)

(MANAGEMENT RESPONSE TO TMI-2 ACCIDENT)

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OUTLINE

The purpose and objective of this testimony is to respond to Issue (10) of the Commission Order CLI-80-5, which questions whether the actions of Metropolitan Edison's corporate or plant management (or any part or individual member thereof) in connection with the accident at Unit 2 reveal management deficiencies that must be corrected before Unit 1 can be operated safely. The testimony, by William S. Lee, President and Chief Operating Officer of Duke Power Company and Chairman of the Board of Directors of INPO, describes Mr. Lee's extensive experience in the utility industry and, in particular, with nuclear power plants; his direct involvement as deputy to Mr. Herman Dieckamp, President of GPU, in overseeing the activities relating to the containment of the TMI-2 accident and its consequences; and his conclusions as to the management capability of Licensee. Mr. Lee concludes that based on his first-hand knowledge, as well as standard indices applicable to all nuclear utilities, Licensee has demonstrated that it has the necessary technical qualifications, leadership qualities, and organizational skills to safely operate TMI-1, and that the actions of Licensee in connection with the accident at Unit 2 do not reveal management deficiencies that must be corrected before Unit 1 can be operated safely.

My name is Mr. William S. Lee. I am President and Chief Operating Officer of Duke Power Company, and Chairman of the Board of Directors of the Institute of Nuclear Power Operations. My testimony addresses the following issue:

CLI-80-5, ISSUE (10)

Whether the actions of Metropolitan Edison's corporate or plant management (or any part or individual member thereof) in connection with the accident at Unit 2 reveal deficiencies in the corporate or plant management that must be corrected before Unit 1 can be operated safely.

I am a graduate engineer, having obtained a Bachelor of Science degree in Engineering, magna cum laude, from Princeton University in 1951. Following my graduation from Princeton, I served in the United States Naval Reserve from 1951 to 1954, and was a participant in the Navy's nuclear program. I joined Duke Power Company in 1955, and served as Engineering Manager from 1962 to 1965, Vice President - Engineering from 1965 to 1971, Senior Vice President from 1971 to 1976, Executive Vice President from 1976 to 1978, and President from 1978 to the present time. Duke Power Company is the only privately-owned electric utility in the country that designs and constructs its own generating facilities. Throughout my entire career with the Company I have been actively engaged in those activities.

I am a registered professional engineer in North Carolina and South Carolina, a Fellow of the American Society of Mechanical Engineers (and was awarded the George Westinghouse gold medal by that Society), a Fellow of the American Society

of Civil Engineers, and a member of the National Academy of Engineering, the National Society of Professional Engineers (and was named the nation's outstanding engineer by the NSPE in 1980), the American Nuclear Society (and received that Society's Walter H. Zinn award in 1980), the North Carolina Energy Policy Council, the Energy Resources Executive Committee of the Edison Electric Institute and the U.S. Committee on Large Dams. I am chairman of the Board of Directors of the Institute of Nuclear Power Operations ("INPO") headquartered in Atlanta, Georgia. I am past Chairman of the Charlotte Chamber of Commerce, and currently serve as a Director of the Charlotte United Community Services and as a Trustee of Queens College.

At the end of 1979, Duke Power Company's gross assets were approximately $5.6 billion, its generating capacity was approximately 12,000 MW, and the peak load which it had experienced was 9,844 MW. Its 1979 annual revenues were approximately $1.6 billion. By most measures, Duke Power and the General Public Utilities System ("GPU") are roughly equivalent in size.

Duke Power Company is the owner and operator of three nuclear generating units at its Oconee Station which were placed in service in 1973 and 1974. In my various capacities at Duke Power, I have been actively involved in the design, construction and operation of those three Oconee units. Moreover, Duke Power has under construction or in operation six

additional nuclear units with an aggregate capacity of 7,000 MW, and I have been actively involved in matters relating to these units.

The three Oconee units employ nuclear steam supply systems manufactured by Babcock & Wilcox ("B&W"). They are essentially similar to the Three Mile Island Units operated by Metropolitan Edison Company ("Met Ed"). Shortly after the Three Mile Island Unit 2 accident on March 28, 1979, the GPU Companies requested my assistance in dealing with the accident and its aftermath. I went to Three Mile Island on April 4, 1979 and, for a time, served in substance as deputy to Mr. Herman Dieckamp, President of GPU, who was overseeing the activities relating to the containment of the accident and its consequences and bringing the unit to a cold shutdown mode. In that capacity, I worked very closely not only with Mr. Dieckamp, but also with Mr. Robert C. Arnold, GPU Service Company Generation Vice President, Mr. Jack Herbein, Met Ed Generation Vice President, and Mr. Gary Miller, TMI Station Superintendent.

One of the activities that Mr. Dieckamp had initiated before I reached Three Mile Island was the assembly from a variety of sources in the United States and abroad of an Industry Advisory Group (sometimes also referred to as the "think tank") designed to bring to bear upon the accident all the knowledge and analytical skills that would be useful in containing the accident and achieving cold shutdown of the

Unit. The members of that group included outstanding engineers, scientists and fuel systems and technology specialists from the National laboratories, major nuclear utilities, equipment manufacturers, and research and testing organizations. In all, there were approximately 250 participants in the Industry Advisory Group at the peak of its activities. As part of my work at Three Mile Island, I also worked with the Industry Advisory Group.

I have been informed that one of the issues in these proceedings is the capability of the management of the Licensee, including whether the actions of Met Ed's corporate and plant management in connection with the accident at TMI-2 reveal deficiencies that must be corrected before Unit 1 can be operated safely. It is the purpose of my testimony to address that issue as it relates to the capability of the GPU Companies' management with respect to the Three Mile Island Units, before, during, and, in important respects, subsequent to the accident.

Based on my experience in working with Messrs. Dieckamp, Arnold, Herbein and Miller, I believe them to be very capable managers of the nuclear activities at Three Mile Island. They possess technical qualifications, leadership qualities, and organizational skills which are outstanding. They also have demonstrated effective abilities to respond to a crisis environment with objectivity and calm.

The Three Mile Island accident and its aftermath presented GPU with a series of problems which had never before been experienced by any nuclear operating organization. Not only were the pressures of the event extreme; they were compounded by the constant demands of the media, the series of investigations by the NRC, and other Federal and State agencies, Congressional and legislative committees, and the like.

By agreement, Mr. Harold Denton of the NRC was the principal spokesman about the progress of activities at the Island. However, the actual conduct of the activities involved in containing the accident and bringing the unit at first to a stabilized condition and then ultimately to a cold shutdown was under the direction of the GPU management drawing, of course, upon the resources available to it from the Industry Advisory Group and others, such as myself, that the GPU companies had assembled to assist them in their efforts. It was a most challenging technical and organizational task. It was accomplished with great skill and steadfast purpose under conditions which were difficult and trying. Everyone involved, and particularly the GPU team, worked extremely long hours seven days a week. The senior GPU personnel provided judgment, leadership, coordination, and an ability to interface with the great number of individuals and organizations that were involved in this extraordinary undertaking.

The assembly of the Industry Advisory Group was an example both of the forsightedness of the GPU management and of the

respect which they enjoyed throughout the industry. Very early on, GPU management recognized the wisdom and necessity of mobilizing a great variety of skills and knowledge to be available in diagnosing the nature of the accident and its consequences and the remedial steps to be taken. In virtually no time at all, they had brought into being an effective ad hoc group to supplement their own substantial resources which then addressed the series of problems, both real and potential, that had to be solved in achieving containment of the accident and cold shutdown. Many of the individuals who responded knew members of the GPU team as a result of prior experience in other activities and this both facilitated their early response and made their contributions more effective. When this was not the case, the reputation which the GPU management group had in the industry also helped to bring the Industry Advisory Group and other groups on-site the full complement of talents required.

I now intend to discuss some of the pre-accident activities of GPU as they bear upon the qualifications of the GPU companies' management of the nuclear activities at Three Mile Island.

In my judgment, the GPU companies demonstrated an admirably disciplined and well-conceived approach when they embarked upon the exploration of the employment of nuclear generation in their service area, in response to the National policy expressed in the Atomic Energy Act of 1954. The first GPU

nuclear unit was the small experimental unit which they installed at Saxton, Pennsylvania.

In my view, this represented a responsible and prudent way to investigate the practical aspects of a potential promising new technology. I also believe that the decision to minimize investment costs by limiting the new facilities at Saxton to the nuclear steam supply and associated items and utilizing a small existing turbo-generator that was ready for retirement was imaginative and, again, a demonstration of sound management. This matched almost exactly Duke Power's entry into the nuclear business with a small, experimental reactor system hooked onto an existing turbo-generator.

The small Saxton nuclear generating unit was a significant contributor to the development of nuclear technology, and particularly in the training of operators. The GPU companies demonstrated the importance that they attached to operator training and performance by making the Saxton unit available for operator training to a number of other utilities in the United States and abroad.

With the Saxton project in being, the GPU companies explored the question of whether nuclear technology had become economically feasible for their service area. They furnished to the AEC and the Joint Committee on Atomic Energy a detailed report setting forth the basis on which they had concluded that they should proceed with the Oyster Creek project. I have not

read that report for some time, but I remember that when it was issued about 15 years ago, I was very much impressed with the efforts that had been made to make an objective evaluation and to set forth all the elements involved so that governmental officials and others could reach their own conclusions. The Oyster Creek generating unit has been an outstanding success. I understand that, in the first decade of its operation, the cost of fuel for Oyster Creek had been about $82 million and that the fuel cost of alternative oil-fired generation during that same period would have been about $670 million, and that the net saving in cost to GPU's New Jersey customers from the operation of Oyster Creek as against an oil-fired unit during this first decade has been in excess of $400 million. I have not independently verified these numbers, but based on my general experience, I regard them as reasonable. From my perspective, this type of performance demonstrates management capability.

The next nuclear generating unit installed by the GPU System was Three Mile Island Unit No. 1, placed in service in September 1974. The nuclear steam supply system for TMI-1 is, as I mentioned earlier, a B&W unit similar to the Oconee units. The NRC "Grey Book" reports that the average capacity factor for the TMI-1 unit through 1978 was 76%, as against an industry average derived from the "Grey Book" of 63%.

In general, the operating efficiency of the Oyster Creek and TMI-1 units was well above the national average. In my

opinion, the performance of the Oyster Creek and TMI-1 units demonstrate superior capability on the part of the GPU management. I know that, at Duke, we admired the capacity factor achieved by TMI-1, as it somewhat exceeded the average of our three units at Oconee with similar reactors.

Another yardstick by which to measure capability in the management of the nuclear units would be in the training of operators, staffing level and levels of expenditure for operation and maintenance purposes. For this purpose, it is important to focus on the views held before the TMI-2 accident rather than apply hindsight today.

Before the accident, there was a widely held view that the NRC standards for licensing of operators and their performance were a sound basis for evaluating management capability in that area. Similarly, there was a widely held view that the NRC inspection and audit of operating procedures provided an objective validation of the adequacy of these operating procedures. From my perspective, in the pre-accident period I would have believed that a company was demonstrating management capability and that it was devoting substantial efforts to safe and effective management of its nuclear units in these areas if:

1. The failure rate on licensing examinations of its operators was less than the average failure rate of the industry as a whole; in fact, the failure rate on such examinations of the TMI operators was only half of the industry average.

2. The size of its operating and maintenance staff was larger than the industry average; the 1978 EEI survey disclosed that the TMI staff was the second largest out of 27 similar plants.

3. The level of its expenditures for operations and maintenance was above average; in fact, the FERC reports that the 1975-1977 period indicate that TMI operations and maintenance expenditures were among the highest for similar plants.

4. The NRC inspection and audit review of the plant procedures had not found serious deficiencies in those procedures; in fact, the report of the Office of the Chief Counsel to the Kemeny Commission on the Role of the Utility and its Suppliers states that a team of NRC inspectors had conducted an 11-day audit of TMI-2 procedures and found no items of non-compliance or discrepancies in format. Since the TMI-2 procedures were based on the TMI-1 procedures

and the record of the performance of TMI-1 was outstanding, this favorable result of the NRC audit would have been particularly reassuring.

5. Attention was paid to simulator training of licensed operators; in fact, GPU had provided simulator training to its operators that I understand was at least equal to the average in the industry. Thus, while NRC standards did not require simulator training for all the operators and most companies had not provided such training for all operators, each of the TMI-2 operators on duty at the time of the accident had simulator training.

In the wake of the accident, the entire industry has made, and is making, a number of changes in operator training, size of staff, qualifications of personnel, monitoring and audits of performance, design of safety systems, dissemination of information and emergency preparedness, all to provide greater assurance of safe performance. Starting with the NRC, we have all been busy implementing lessons learned from the accident. As have other utilities, GPU has conducted a comprehensive operator retraining and requalification program.

I have reviewed GPU's proposed organizational structure for consolidating nuclear activities into the new subsidiary GPU Nuclear Corporation. Based upon my management experience,

it is my view that this is a strong management concept that can be effective in providing an integrated single minded approach which will give additional assurances of safety.

I also have admiration for the technical and management capabilities of the three top executives of the proposed GPU Nuclear Corporation. Having known Messrs. Dieckamp and Arnold for years, I have personally witnessed their strengths and innovative leadership during both normal times as well as circumstances of uncanny stress. Whereas I have known Mr. Clark for a shorter period, I have personally reviewed his background and experience record and participated in interviewing him. As he knows, we at Duke Power were prepared to offer Mr. Clark a significant management post in our company before he decided to join the GPU organization. I feel that we at Duke have a strong team, and that Mr. Clark could have made us stronger. Thus, with a strong organizational plan and with excellent management capabilities at the top, I conclude that GPU has two of the most important ingredients for success and safety.

In summary, it is my judgment that the GPU management has demonstrated strong capability in the preparation for, and conduct of, its nuclear program, in the handling of the TMI-2 accident and its aftermath, and in organizational planning and top-level manning in preparation for ongoing nuclear activities.