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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-Management Remand)
(Three Mile Island Nuclear)	
Station, Unit No. 1))	

TESTIMONY OF WILLIAM W. LOWE

My name is William W. Lowe. I am a founder and Chairman of the Board of the engineering and consulting firm of Pickard, Lowe and Carrick, Inc., as I was at the time of the TMI-2 accident. And I am now, as I was then, a consultant to the General Public Utilities Corporation concerning nuclear power matters.

The account which follows is about the containment pressure spike referred to in the mailgram from Mr. H. Dieckamp to Congressman Udall of 9 May 1979. I will describe my direct personal knowledge of how and when the spike was first recognized to be evidence of major core damage and how and when this view was verified.

I have been careful to reconstruct events as they were, not as they may now be perceived, and have consulted colleagues in the interest of accuracy. The clock times given for some events may be in error but not, I believe, by more than a few hours.

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In judging when the significance of the containment pressure spike was first recognized, it is important to know when it was not. So I will start by summarizing my knowledge of prior events and will end by saying that this knowledge, based as it is on intimate personal involvement in the matters described by the mailgram, leads me to the clear conclusion that the statements in the mailgram are accurate concerning the spike.

At 0830 on 28 March 1979 our office in Washington was notified by GPU personnel of potential radioactive releases from TMI-2 and we were requested to provide weather data. At 0930 the request was repeated. We were asked because we have computers in Washington which can read, correlate, and double check weather data being measured by instruments on the weather tower at the TMI site. These computers can also compute radiation doses using such data. At 1025 we were informed that an accident had occurred and a general emergency declared. At 1140 Mr. Jack Thorpe, a senior manager for GPU, called and asked me to stand by to come to TMI-2. He was then Chairman of the TMI-2 General Office Review Board of which I was and am a member. At 1150 I called several of our engineers in from around the country so they would also be available. At 1620 I called Mr. Thorpe requesting status and learned that there had been a steam bubble in A and B loops of the primary system preventing operation of the reactor coolant pumps but the steam in one loop had been condensed and cooling was by feed and bleed.

He reported the plant thinks core cooling is recovered. There were more than ten, probably as many as twenty, phone calls between our Washington office and GPU during the day and evening and some of them were extensive. No mention was made of the pressure spike or hydrogen.

The next morning, the 29th of March, at 0830, Robert Arnold, then Vice President for Generation of GPU Service Corporation, called me regarding the formation of an Events Analysis and Recovery Planning Team. He asked me to be a member and to come to the TMI Observation Center by early afternoon. I called Bob Keaten at GPU about 0930 and recommended primary coolant be sampled and measured for the isotope silver-110 which, if present, would have implied damage to control rods. I arrived at the Observation Center about 1400. A briefing for several U.S. Senators was underway in which Mr. Herbein, Mr. Dieckamp and others were involved.

After this was over, the Analysis and Recovery Team members, comprised of senior technical people from GPU and myself, assembled at 1530 in the TMI-1 supervisors conference room and were divided into two groups: one for Events Analysis and one for Recovery Planning. I was assigned to the latter. There was considerable discussion of the division of work between the two groups and a briefing about plant status. A decision was made to debrief all operators coming on or off shift and record their accounts of what happened.

I believe we were told during the meeting, which started at 1530, and/or during a discussion with Mr. Kunder immediately thereafter, that the waste gas decay tanks were near their relief pressure. A large part of the gas in them would normally be hydrogen. No one mentioned or implied, however, that there had been hydrogen produced by a reaction between zircalloy fuel cladding and water or that there had been an ignition or explosion of hydrogen in containment or anywhere else. Knowledge of the accident was no where near that complete.

The meeting began to break between 1700 and 1800 to get food and so that each group could work separately. At this point Mr. George Kunder took me aside for a short but intensive explanation of what he perceived to be the urgent needs of the plant. After about ten minutes of it, several of us decided we should go to the control room forthwith and get first-hand information. Consequently, two GPU engineering managers and I suited up, and did so.

In the control room we talked with some operators and engineers and observed what was going on. There seemed to be unresolved problems relating to plant stabilization and damage control. The operators were having trouble holding the pressurizer level steady.

After half an hour or so, we left the control room and went to eat with several others. We discussed what we knew of plant status and accident sequence and how to proceed with recovery planning. We tried to contact Gary Broughton to get

more information about accident sequence. Earlier he had shown some of us a preliminary analysis of the first minutes of the primary system pressure and temperature transient. When we found him, he confirmed the system had reached saturated conditions within the first few minutes after the reactor trip.

After dinner, the Recovery Planning group to which I had been assigned met in a hotel room to discuss approaches to recovery planning. These discussions focused on how to identify equipment requiring repair and replacement and how to clean up liquid, gaseous and solid radioactive wastes. Several of us were uncomfortable during these discussions because we sensed we should go to the plant to get more information and to assess some of the problems operations was having. Consequently, the group went back to the TMI-1 supervisors conference room at the site.

Shortly after we had reassembled at TMI, I followed Mr. Herbein, the site leader, as he left the conference room and told him the basic problem was stabilization, not recovery, and that several senior people should be assigned forthwith to the control room to help with stabilization and damage control. Mr. Herbein immediately re-entered the conference room, reiterated this position, and asked for volunteers. Tom Crimmins, who at the time was Manager of Generation Engineering for Jersey Central Power and Light Company, and I volunteered, suited up and went to the control room at about 2200 hours.

Our first priority was to connect the two waste gas decay tanks back to the containment. These tanks contained radioactive gas and were near relief pressure. We assumed a primary constituent of the gas was hydrogen as it would be in normal operation and we planned carefully to avoid its ignition in situ or as it entered containment. I insisted there be a flame arrestor in the line of tubing which was to connect the tanks with the containment. We requested an investigation to find any potential ignition sources within twelve feet of the exit point. After the plan was outlined, execution was turned over to Ron Toole who had reviewed the pertinent drawings with us.

We then sought further information about plant status. We were told that the primary system was still "mushy," that is, it was hard to control pressurizer level. The operators were concerned about this problem but still had no explanation which made sense. They thought there might still be a steam bubble outside the pressurizer but none of the many temperature readings were high enough for that.

At about 2300 the operators lost control of pressurizer level and Joseph Logan, Unit 2 superintendent, who with several others was conferring with Crimmins and me in the supervisor's office at the back of the control room, left to take direct charge of the operating crew. I followed to observe. At that point, a young engineer assigned to collect data approached me and said, "Have you seen this?" He held out the containment building pressure recorder chart trace showing a pressure spike