RELATED CORRESPONDENCE

LIC 9/15/80

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
	)	(Restart)
(Three Mile Island Nuclear	)	
Station, Unit No. 1)	)	

LICENSEE'S TESTIMONY OF

LOUIS C. LANESE

IN RESPONSE TO

SHOLLY CONTENTION NO. 1

(CONTAINMENT ISOLATION)

OUTLINE

The purpose and objective of this testimony is to respond to Sholly Contention 1, which asserts that safety-grade high radiation signals should be required to automatically initiate containment isolation of two specific process systems. The testimony discusses the relevant TMI-2 accident experience on containment isolation and Licensee's actions to add additional containment isolation initiation signals due to reactor trip. Since reactor trip will occur before significant radiation would be released to the containment atmosphere, containment isolation will have occurred in advance of any isolation signals that would be generated by saftety-grade high radiation instrumentation in the process lines leaving containment.

INTRODUCTION

This testimony, by Mr. Louis C. Lanese GPU Senior Control and Safety Analysis Engineer, is addressed to the following contention:

SHOLLY CONTENTION NO. 1

> It is contended that in order to adequately protect the public health and safety, the containment isolation signals for TMI-1 must include the following:
>
> 1. A safety-grade high radiation signal for the reactor building vent and purge system.
> 2. A safety-grade high radiation signal for the reactor building sump discharge piping.
>
> It is further contended that such additions to the containment isolation signals must be made prior to the Restart of TMI-1 in order to adequately protect the public health and safety.

RESPONSE TO CONTENTION

BY WITNESS LANESE:

Sholly Contention No. 1 takes issue with the containment isolation design of TMI-1. It asserts that the public health and safety would be better protected by the addition of a safety grade high radiation isolation signal to the containment purge valves and reactor building sump valves. Contrary to this contention, the diverse containment isolation signals now used at TMI-1 are superior to a high radiation signal. The testimony also explains how the revised containment isolation

design incorporates the lessons learned from the TMI-2 accident.

During the TMI-2 accident some water was transferred from the reactor building sump to the Auxiliary Building. There was no fuel damage until much later into the event, however, so that the transfer of this water prior to that time did not cause a significant release. An examination of the plant radiation monitors substantiates that the very minor releases that occurred due to transfer of the sump water terminated after the reactor building sump pumps were turned off.

Prior to containment isolation, some gaseous activity was transferred to the waste gas vent header from the reactor coolant drain tank (pressurizer relief quench tank). Leaks in the waste gas system resulted in activity being released to the auxiliary and fuel handling building atmosphere. The drain tank releases were small, however, in comparison to releases from the makeup tank venting on the following days.

The predominant release path from inside containment throughout the course of the accident resulted from the use of the makeup and letdown systems after core damage had occurred. The circulation of this water resulted in the separation of the radioactive gases in tanks which are located in the auxiliary building. The subsequent release of this gas over the next several days resulted primarily from leaks in the waste gas disposal system.

The contention asserts that the TMI-2 containment was not isolated in a timely manner following the accident. Review of the plant ventilation monitors indicates that none of the noble gases were released before containment isolation. Thus, delayed isolation of containment did not cause significant releases of radioactivity.

Nevertheless, the TMI-2 accident did demonstrate that significant fuel damage can occur in the absence of high reactor building pressure and that a diverse containment isolation signal should be provided. The NRC Staff, therefore, required (Reference 1) that, in addition to the present isolation signal on high containment building pressure, a diverse signal be added to isolate containment upon initiation of the Engineered Safety Features Actuation System (ESFAS). Instead of this signal, Licensee has decided to use the reactor protection system trip signal because it occurs before radioactivity could be released from the containment. This alternative has been accepted by the NRC Staff.

During discovery, Mr. Sholly expressed concern over the use of the reactor trip signal because, in his view, this signal will result in "clearing of the isolation signal when the low pressure condition (1800 psig) is not present, but when HPI may still be in progress" (Reference 2). Contrary to this assertion, if a 1600 psig ESFAS signal and reactor trip isolation were both initiated and RCS pressure subsequently rose above 1900 psig.[1] the RPS isolation signal would not be

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1 The 1800 psig trip setpoint has been revised to 1900 psig for reasons unrelated to Mr. Sholly's stated concern.

cleared automatically. This is because resetting or bypassing the RPS trip signal requires a deliberate operator action which is controlled by operating procedures. Even after bypass or reset of the signal, the containment isolation valves will not open unless the operator takes specific action (in accordance with operating procedures) to open specific valves. (See Licensee's Testimony on Safety System Bypass and Override, in response to UCS Contention 10.)

A non-safety grade radiation isolation signal has always existed on the TMI-1 containment purge system. As part of the containment isolation system redesign, these following additional lines now have a high radiation isolation signal:

1. Reactor building sump drain
2. Letdown line
3. Steam generator, pressurizer and RCS sample lines
4. Pressurizer relief quench tank (also referred to as the RCDT) vent and liquid discharge lines.

In addition, the reactor coolant pump seal return and intermediate closed cooling water lines have control room alarms on high radiation.

The non-safety grade radiation isolation signals are acceptable because of the additional presence of the anticipatory reactor trip containment isolation signal. The containment purge and sump lines, the letdown line, sample lines and quench tank vent lines will have been isolated before any

significant radioactivity could be transferred from the containment. Plant procedures provide the operator with sufficient guidance to prevent inadvertent opening of these lines.

In summary, the lessons from the TMI-2 accident regarding containment isolation have been correctly incorporated. A series of diverse containment isolation signals have been defined which provide prompt isolation of those lines which could transfer radioactivity out of the containment. In particular, isolation of these lines on the reactor trip signal occurs before radioactivity can be released from containment.

REFERENCES

1. NRC I&E Bulletin 79-05C, Item 6.
2. Sholly, Steven "Response to Licensee's First Set of Interrogatories" dated February 6, 1980.

LOUIS C. LANESE

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Education: B.S., Engineering Science, Newark College of Engineering, 1970.
M.E., Nuclear Engineering, New York University, 1972.
Nuclear Engineering courses, Polytechnic Institute of New York, 1975 to present (completing thesis).

Experience: Senior Control and Safety Analysis Engineer, GPU Service Corporation, 1979 to present. Responsibilities include the performance of the TMI-1 Restart Safety Analysis; TMI-1 Emergency Feedwater design, design review of TMI-1 restart and long-term modifications. Member of the TMI-1 and TMI-2 safety review committees (GRC).

Control and Safety Analysis Engineer, GPU Service Corporation, 1978 to 1979. Responsibilities included the performance of containment analyses in support of plant operation; developing analyses in support of the TMI-2 feedwater system modification; preparation of the TMI-1 restart safety analysis.

Lead Nuclear Licensing Engineer, GPU Service Corporation, 1977 to 1978. Primary responsibility for TMI-2 licensing activities and for licensing matters involving generic safety issues affecting all GPU system plants.

Safety and Licensing Engineer, GPU Service Corporation, 1974 to 1977. Responsibilities included technical

resolution of TMI-2 licensing open items; conformance of Forked River systems design to licensing criteria; and, safety review of Oyster Creek radwaste facility.

Assistant Safety and Licensing Engineer, Ebasco Services, Inc. Performed licensing and safety review of St. Lucie Units 1 and 2 Safety Analysis Report pertaining to instrumentation and power systems; cooling water and HVAC systems, radwaste systems; and, accident analysis. Performed dose analyses and developed secondary system source terms.

Professional Affiliations:

Babcock & Wilcox Owners Group, Chairman of the Asymmetric LOCA Loads Technical Subcommittee for 177 FA B&W plants.