EDO Principal Correspondence Control

FROM: DUE: 07/19/05 EDO CONTROL: G20050452
DOC DT: 06/17/05
FINAL REPLY:

David Lochbaum
Union of Concerned Scientists

TO:

Chairman Diaz

FOR SIGNATURE OF : ** GRN ** CRC NO: 05-0327

Dyer, NRR

DESC: ROUTING:

Unaddressed Regulatory Implications of "TMI SLIME"

Reyes
Virgilio
Kane
Silber
Dean
Cyr/Burns
Collins, RI
Paperiello, RES
Wallis, ACRS

DATE: 06/23/05

ASSIGNED TO: CONTACT:

NRR Dyer

SPECIAL INSTRUCTIONS OR REMARKS:

Add EDO and the Commission for concurrence. EDO and Commission to review response prior to dispatch.

OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

Date Printed: Jun 23, 2005 08:52

PAPER NUMBER:	LTR-05-0327	**LOGGING DATE:**	06/22/2005
ACTION OFFICE:	EDO		
AUTHOR:	David Lochbaum		
AFFILIATION:	UCS		
ADDRESSEE:	Nils Diaz		
SUBJECT:	Unaddressed regulatory implications of "TMI SLIME"		
ACTION:	Direct Reply		
DISTRIBUTION:	RF, SECY to Ack		
LETTER DATE:	06/17/2005		
ACKNOWLEDGED	No		
SPECIAL HANDLING:	Made publicly Available in ADAMS via SECY/EDO/DPC		
NOTES:	Commission should review response prior to dispatch		
FILE LOCATION:	ADAMS		
DATE DUE:	07/21/2005	**DATE SIGNED:**	

Union of Concerned Scientists
Citizens and Scientists for Environmental Solutions

June 17, 2005

Dr. Nils J. Diaz, Chairman
Mr. Edward McGaffigan, Jr., Commissioner
Mr. Jeffrey S. Merrifield, Commissioner
Dr. Gregory B. Jaczko, Commissioner
Dr. Peter B. Lyons, Commissioner
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: UNADDRESSED REGULATORY IMPLICATIONS OF "TMI SLIME"

Dear Mr. Chairman and Commissioners:

In 2003, the Advisory Committee on Reactor Safeguards (ACRS) raised a concern about the potential for chemical effects to adversely affect the head loss across the debris bed forming on the containment sump screens at pressurized water reactors during the recirculation phases of accidents. The ACRS was reviewing the NRC staff's resolution plan for Generic Safety Issue 191 (GSI-191). The ACRS became aware of the memo dated September 14, 1979, from the Oak Ridge National Laboratory to the GPU Service Corporation reporting the presence of a gelatinous material in a water sample taken from the Three Mile Island Unit 2 containment sump following its accident. This "TMI slime" issue prompted a series of chemical effects and head loss testing to answer the ACRS's question.

I attended a public meeting on January 8, 2004, between the NRC staff and industry representatives about GSI-191.[1] During that meeting, a representative from the Los Alamos National Laboratory working under contract to the NRC to answer the ACRS's question reported that his inquiry into the source and nature of the TMI slime indicated that approximately one-third of the water residing in the reactor containment after the accident was untreated water from the Susquehanna River and that the most likely source of this river water was leakage from the containment chillers.

The recent release of reports on the chemical effects and head loss testing address the ACRS's question about the potential impact from gelatinous materials on the resolution plan for GSI-191. There are at least two other regulatory implications of the "TMI slime" that remain to be addressed. These implications are unrelated to GSI-191, but warrant addressing nonetheless. Those two implications are:

1) Impact on release pathways: The regulatory requirements governing containment penetrations do not mandate automatic isolation valves be installed for a closed-loop system such as water-filled piping used to cool components inside the containment. The underlying assumption is that a closed-loop system does not represent a pathway for radioactive materials to escape from containment. Apparently, one of the leading candidates for the significant amount of Susquehanna River water found in the TMI containment is leakage from a closed-loop system. In

[1] The NRC staff summarized this meeting in a memo dated February 2, 2004.

Washington Office: 1707 H Street NW Suite 600 • Washington DC 20006-3919 • 202-223-6133 • FAX: 202-223-6162
Cambridge Headquarters: Two Brattle Square • Cambridge MA 02238-9105 • 617-547-5552 • FAX: 617-864-9405
California Office: 2397 Shattuck Avenue Suite 203 • Berkeley CA 94704-1567 • 510-843-1872 • FAX: 510-843-3785

general, leak(s) in a closed-loop system inside containment cannot pose a potential release pathway for radioactive material as long as the system is operating because pressure of the fluid inside the leaking pipe will likely exceed the containment pressure. When a closed-loop system is not operating, reduced pressure inside its piping could create the potential for a release pathway. The questions raised by this implication include: Are operating procedures sufficient to prevent the creation of a release pathway when an operating system with a closed-loop portion inside containment is removed from service?

2) Impact on environmental qualifications: Certain equipment, mostly electrical devices, may not function properly when submerged in water. The NRC has issued numerous generic correspondence documents on this subject (e.g., Bulletin 79-01B, Information Notice 89-63 and Information Notice 2002-12). To demonstrate compliance with the requirements for environmental qualification of equipment inside containment, the submergence level is calculated based on the containment geometry, volume of the make-up water tank, and projected leak rates from systems inside containment. The potential for a significant volume of water to leak into containment, as may have happened in 1979 to produce the TMI slime and certainly happened in 1980 to submerge the lower section of the reactor vessel at Indian Point Unit 2, poses a challenge to environmental qualification of equipment.

On behalf of the Union of Concerned Scientists, I respectfully ask that you direct the NRC staff to either verify that both of these implications are fully addressed by existing regulatory requirements or undertake steps to address these implications.

Sincerely,

David Lochbaum
Nuclear Safety Engineer
Union of Concerned Scientists
1707 H Street NW, Suite 600
Washington, DC 20006
(202) 223-6133