

May 30, 2006

TOPIC: POST-LOCA WATER MANAGEMENT STRATEGIES TO OPTIMIZE LONG TERM CORE COOLING AVAILABILITY

INDUSTRY: NUCLEAR ENERGY INSTITUTE/PWR OWNERS GROUP

SUBJECT: NRC MEETING SUMMARY FOR THE MAY 11, 2006, REGARDING WATER MANAGEMENT POST-LOCA

On May 11, 2006 , the U.S. Nuclear Regulatory Commission (NRC) staff met with representatives of the Nuclear Energy Institute and the Pressurized Water Reactors Owners Group at One White Flint North, Rockville, MD. The purpose of the meeting was to develop an understanding of the challenges and impediments to reducing containment spray flow following a loss of coolant accident. This meeting was also intended to explore other possible water management strategies that could extend the injection phase of a loss-of-coolant accident (LOCA).

The first speaker was Thomas Martin, Director, Division of Systems Safety, Office of Nuclear Reactor Regulation (see attached slides). Mr. Martin briefly discussed NRC position the possible safety enhancements from extending the post-LOCA injection phase (delaying the onset of the containment recirculation phase). Mr. Martin stated that extending the injection phase would give operators more time to establish a reliable recirculation path, would reduce the debris reaching the containment recirculation sump screen, would reduce downstream effects resulting from containment recirculation, and would extend the time for mitigative actions. It was pointed out that, by minimizing the use of containment spray (possibly by eliminating automatic spray initiation), significantly more water could be made available for injection into the core. Mr. Martin stated that the NRR staff was interested in learning what the industry considers to be the major technical, legal and regulatory obstacles impeding the implementation of potential containment spray related safety enhancements. Mr. Martin asked the industry representatives to discuss any other possible measures which could reduce containment spray flow or prolong the post-LOCA injection phase.

Bob Lutz and Larry Smith of the PWR Owners Group followed (see attached slides). During their presentation, the industry representatives focused on containment spray operational changes and briefly discussed other strategies for long term core cooling. The point was made that, although the PWR Owner's Group shares the NRC staff's opinion regarding the safety benefit of removing the containment spray automatic initiation, several changes in regulatory practice need to be made to facilitate removal of this feature. The industry representatives stated that PWR reactor licensees would be concerned about potentially violating design or licensing bases by changing Emergency Operating Procedure (EOP) steps. Operator re-training would also be an industry concern, since operators are generally very reticent to turn off or block equipment which perform safety functions.

The industry presentation highlighted two major industry initiatives taken in the area of water management: WCAP-16204, Revision 1, "Evaluation of Potential ERG and EPG Changes to Address NRC Bulletin 2003-01 Recommendations (PA-SEE-0085)" (NRC Bulletin 2003-01 being the vehicle by which the NRC requested PWR reactor licensees to take interim compensatory measures while Generic Letter 2004-02 responses were being developed and implemented), and Westinghouse Owners Group (WOG) Letter 05-370), an overview of generic studies of safety benefits of large break LOCA re-definition.

The first of these initiatives, WCAP-16204, identified four water management related "candidate operator actions" (COAs, forms of sump clogging related interim compensatory measures) that are considered by the PWR owner's group to be generally applicable to all plants (although the other COAs in WCAP-16204 were appropriate for consideration on a plant-specific basis). These were: 1) termination of one or both trains of spray prior to sump recirculation: 2) termination of one train of HHSI (high head safety injection) after recirculation alignment: 3) refill of the refueling water storage tank (RWST) after transfer to sump recirculation: and 4) operator responses to loss of recirculation flow due to sump blockage. [Note: WCAP-16204 has not been officially submitted to the NRC, although a summary of this analysis was presented to the NRC at a January 22, 2004, meeting]. The industry representatives stated that significant regulatory/licensing effort would be required to support the EOP changes implementing the first two COAs above, but that the cost would not be prohibitive.

The second of these initiatives was WOG Letter 05-370, "Safety Benefits of LBLOCA Re-Definition" (provided to NRC on August 16, 2005), which examines the potential for preventing automatic containment spray actuation using the transition break approach from the large break re-definition (50.46a rulemaking) initiative. The industry's addressed the insights and conclusions of the analyses which had been performed to investigate prevention of automatic spray actuation: a design basis accident (DBA) containment temperature, pressure and heat load analysis, a radiological dose analysis, and a risk assessment. A salient industry conclusion for their large, dry containment reference plant was that the peak containment pressure would be less than the containment design pressure.

At the end of the presentation the industry stated their perceived main impediments for elimination of automatic containment spray initiation. These were: 1) containment design pressure and temperature: 2) offsite and control room radiological dose: 3) containment equipment qualification: 4) operator actions changes: and 5) NRC approval of license amendment requests.

All meeting participants agreed that the best path forward would be to identify a pilot plant for elimination of automatic containment spray initiation, and to actually conduct the analytical, training, regulatory and licensing steps required to implement the change at that reactor. It was agreed that a future meeting would be held to discuss technical and regulatory issues, and the conduct of a pilot plant effort to eliminate automatic containment spray initiation.

Members of the public were in attendance. Public Meeting Feedback forms were received. Comments received included the following: [*summarize feedback/comments/suggestions*]. These have been forwarded to the NRR Senior Communications Analyst who will forward them to the Office of the Executive Director for Operations.

Please direct any inquiries to me at 301-415-2526, or [rlt1@nrc.gov](mailto:rlt1@nrc.gov)

Sincerely,

*/RA/*

Roberto Torres, General Engineer - NSPDP  
Safety Issue Resolution Branch  
Division of Safety Systems  
Office of Nuclear Reactor Regulation

Enclosures: 1. List of Attendees  
2. Licensee Handout(s)

cc w/encls: R. Architzel, NRC  
T. Collins, NRC  
J. Hopkins, NRC

J. Butler, NEI  
M. Dingler, PWROG

Please direct any inquiries to me at 301-415-2526, or [rtt1@nrc.gov](mailto:rtt1@nrc.gov)

Sincerely,

***/RA/***

Roberto Torres, General Engineer - NSPDP  
Safety Issue Resolution Branch  
Division of Safety Systems  
Office of Nuclear Reactor Regulation

- Enclosures:
1. List of Attendees
  2. Licensee Handout(s)

cc w/encls: R. Architzel, NRC                      J. Butler, NEI  
                   T. Collins, NRC                      M. Dingler, PWROG  
                   J. Hopkins, NRC

DISTRIBUTION:

PUBLIC            SSIB R/F            J. Hopkins

Package Accession# ML061460369 - Package  
 ADAMS Accession # ML061460371 - Summary  
 ADAMS Accession # ML061460378 - Slide 1  
 ADAMS Accession # ML061460383 - Slide 2  
 ADAMS Accession # ML0614603480- Attendees  
 ADAMS Accession # ML061210384 - Meeting Notice            NRR-106

<b>OFFICE</b>	NRR/DSS/SSIB	NRR/DPR/PSP
<b>NAME</b>	RTorres	JHopkins
<b>DATE</b>	05/ 30 /06	05/ 30 /06

**OFFICIAL RECORD COPY**

ATTENDEES

NRC MEETING WITH INDUSTRY

MAY11, 2006

**NRC**

T. Martin  
M. Hart  
J. McGuire  
D. Cullison  
R. Reyes  
H. Wagage  
J. Wermiel  
T. Collins  
R. Architzel  
E. Throm  
J. Lehning  
R. Torres  
T. Hafera  
M. Tschiltz  
T. Koshy  
D. Dube  
P. Hearn  
M. Kotzalas  
J. Hopkins

**INDUSTRY**

P. Leonard, AEP  
B. Jaquith, Westinghouse  
M. Dinglor, WCWOG/PWROG  
B. Henry, FAI  
B. Lutz, Westinghouse  
L. Smith, Westinghouse  
J. Butler, NEI  
D. Raleigh, US Scientech  
M. Scarpello, AEP

ENCLOSURE