

**ENCLOSURE 2**

**Areas of Agreement and Disagreement between the  
NRC Staff and the Advisory Committee on Reactor  
Safeguards (ACRS)**

**ADAMS ML102780592**

## **Areas of Agreement and Disagreement between the U. S. Nuclear Regulatory Commission Staff and the Advisory Committee on Reactor Safeguards**

The U.S. Nuclear Regulatory Commission (NRC) staff (staff) has reviewed Advisory Committee on Reactor Safeguards (ACRS) correspondence to the staff and the Commission. The areas where the staff agrees or disagrees with ACRS regarding containment accident pressure are discussed in the excerpts from that correspondence, below.

1. May 19, 2010, letter from ACRS to the NRC Executive Director for Operations (EDO) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML101300332)

ACRS: The draft guidance developed by the staff “provides an improved framework for a more comprehensive assessment of the acceptability of crediting containment accident pressure in meeting net positive suction head [NPSH] requirements.” However, ACRS notes that the guidance is deterministic and “should be complemented by a plant-specific Probabilistic Risk Assessment (PRA) analysis of the impact of containment accident pressure (CAP) credit.”

STAFF POSITION: The staff developed more detailed and quantitative guidance to respond to ACRS recommendations that margins and uncertainties be explicitly addressed and discussed it at the 572<sup>nd</sup> ACRS meeting on May 6, 2010. The staff intends to apply this guidance, after further discussions with the industry, to future reviews involving the use of CAP in determining NPSH margin.

Also, at the staff’s request, the Boiling-Water Reactor Owners Group (BWROG) developed a statistical approach to calculating NPSH margin (described in Enclosure 1, Section 6.3.4) that also quantifies margin (ADAMS Accession No. ML080520261). The staff’s recently-developed guidance contains portions of the BWROG approach.

The staff’s judgment is that CAP credit does not call into question adequate protection of public health and safety. This is based on a licensee’s or applicant’s compliance with NRC regulations, the high standards for maintaining containment integrity and the low risk of crediting CAP as determined in probabilistic risk assessments. As discussed in the SECY paper, current Commission guidance is that the staff cannot require risk information in this case.

2. March 18, 2009, letter from ACRS to EDO (ADAMS Accession No. ML090700460)

ACRS: For cases in which operator actions are required to maintain containment overpressure, licensees should show how these actions can be implemented in their procedures, that they can be performed reliably, and that any increase in risk associated with these actions is acceptably small.

STAFF POSITION: The staff agrees with this recommendation, except with respect to risk. Staff human factors experts review licensee or applicant proposals to use operator actions to perform safety functions to ensure that the actions can be safely performed and are consistent with regulations, staff guidance, and Commission policy.

3. March 18, 2009, letter from ACRS to EDO (ADAMS Accession No. ML090700460)

ACRS: Credit for CAP should be limited in amount and duration.

STAFF POSITION: The staff disagrees with this recommendation for several reasons. The important parameter for successful pump operation with respect to avoiding excessive pump cavitation is the NPSH margin. As discussed in Enclosure 1, Section 2.0, containment pressure is one consideration in determining NPSH margin. However, any limit on the amount of CAP is arbitrary since it does not, by itself, determine whether a pump will or will not cavitate excessively. The staff guidance is formulated in terms of successful operation of the emergency core cooling system (ECCS) and containment heat removal pumps, rather than indirectly by using the CAP. The staff guidance ensures that these pumps can perform their safety function with respect to cavitation by specifying limits on the NPSH margin, including uncertainties in pump parameters and containment accident analysis results. A limit on the time that a pump depends on CAP for acceptable performance is also arbitrary and not related to any physical failure mechanism.

4. March 18, 2009, letter from ACRS to EDO (ADAMS Accession No. ML090700460)

ACRS: Regulatory Guide 1.82 Revision 3 ["Water Sources for Long-Term Recirculation Cooling following a Loss-of-Coolant Accident," issued November 2003 (ADAMS Accession No. ML033140347)] should be revised to include thermal-hydraulic analyses, which address the conservatisms associated with the licensing-basis analyses and explicitly account for uncertainties and probabilistic risk assessment (PRA) results consistent in scope and quality with that specified by Regulatory Guide 1.174 ["An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," issued July 1998 (ADAMS Accession No. ML003740133)].

STAFF POSITION: The staff agrees with the explicit accounting for uncertainties, addressed above as Item 1. The guidance developed by the staff explicitly accounts for uncertainties in NPSH margin.

Regarding the use of PRA, the staff's judgment is that CAP credit does not call into question adequate protection of public health and safety. As discussed in the SECY paper, current Commission direction is that the staff cannot require risk information in this case.

5. March 18, 2009, letter from ACRS to EDO (ADAMS Accession No. ML090700460)

ACRS: Licensees should continue to be requested to use the current guidance in Regulatory Guide 1.82, Revision 3, and the licensing-basis analyses assumptions and methods to demonstrate that the available net positive suction

head (NPSH) exceeds that required for operation of the emergency core cooling system (ECCS) and containment heat removal system pumps.

STAFF POSITION: The staff developed new guidance as ACRS recommended. When finalized, this new guidance will replace the guidance in Regulatory Guide 1.82, Revision 3. The staff is currently discussing the new guidance with BWROG. The new methods focus on pump performance and include some pump cavitation phenomena not previously considered by the industry or the staff in these types of reviews. Enclosure 1, Section 6.0, describes this guidance.

6. ACRS letter dated September 20, 2005 (ADAMS Accession No. ML052630562)

ACRS: Credit for containment accident pressure should only be granted for robust containments for which there is a positive means for indication of containment integrity such as inerted or subatmospheric containments.

STAFF POSITION: The staff disagrees with this recommendation. A leakage rate greater than the value specified in the plant's technical specifications is beyond a plant's design basis. However, the importance of this recommendation will be evaluated as part of the suggested backfit analysis if the Commission directs the staff to pursue Option 2.