August 5, 2004

MEMORANDUM TO: Suzanne C. Black, Director
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

THRU: Michael D. Tschiltz, Chief /***RA/***
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

FROM: Robert Dennig, Chief
Containment and Accident Dose Assessment Section
Probabilistic Safety Assessment Branch
Division of Systems Safety and Analysis
Office of Nuclear Reactor Regulation

SUBJECT: ACTION PLAN FOR REVISING REGULATORY DOCUMENTS PERTAINING TO CREDITING CONTAINMENT ACCIDENT PRESSURE IN DETERMINING NET POSITIVE SUCTION HEAD OF EMERGENCY CORE COOLING AND CONTAINMENT HEAT REMOVAL PUMPS (TAC MC3180)

During the review of the Vermont Yankee extended power uprate license amendment request several problems have been identified with regulatory documents pertaining to crediting containment accident pressure in determining net positive suction head of emergency core cooling and containment heat removal pumps. The Probabilistic Safety Assessment Branch has developed the attached action plan to revise these documents to be consistent with the current policy.

Attachment: As stated

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Distribution: SPSB:r/f

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Lobel\npsh action plan memo for R Dennig thru M Tschiltz to S Black

OFFICE	SPSB	SC:SPSB	BC:SPSB
NAME	RLobel:nxh2	RDennig	MTschiltz
DATE	08/ 03 /04	08/ 03 /04	08/ 05 /04

OFFICIAL RECORD COPY

ACTION PLAN FOR REVISING GUIDANCE ON CREDIT FOR CONTAINMENT ACCIDENT PRESSURE FOR DETERMINING AVAILABLE NPSH

I. Background

The guidance on credit for containment accident pressure in determining available NPSH for the ECCS and containment heat removal pumps is contained in the following documents.

1. Regulatory Guide 1.1 Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal System Pumps(11/2/1970)

Regulatory Guide 1.1 contains the following position:

> Emergency core cooling and containment heat removal systems should be designed so that adequate net positive suction head (NPSH) is provided to system pumps assuming maximum expected temperatures of pumped fluids and no increase in containment pressure from that present prior to postulated loss of coolant accidents.

2. Regulatory Guide 1.83 Revision 3 states in A. Introduction that

> This regulatory guide has been revised to include guidance previously provided in Regulatory Guide 1.1, "Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal System Pumps." The provisions of Regulatory Guide 1.1 have been updated in this guide to reflect the results of the NRC's review of responses to Generic Letter 97-04, "Assurance of Sufficient Net Positive Suction Head for Emergency Core Cooling and Containment Heat Removal Pumps," dated October 7, 1997.

Regulatory Guide 1.82 Revision 3 states, under B. Discussion for both the PWR section and the BWR section that

> For some operating reactors, some credit for containment accident pressure may be necessary [in determining available NPSH]. This should be minimized to the extent possible.

Regulatory Guide 1.82 Revision 3 contains the following relevant positions:

> 1.3.1 Pressurized Water Reactors
>
> 1.3.1.2 For certain operating PWRs for which the design cannot be practicably altered, conformance with Regulatory Position 1.3.1.1 [which is identical to the position of Regulatory Guide 1.1] may not be possible. In these cases, no additional containment pressure should be included in the determination of available NPSH than is necessary to preclude pump cavitation.

ATTACHMENT

2. Boiling Water Reactors

2.1.1.2 For certain operating BWRs for which the design cannot be practicably altered, conformance with Regulatory Position 2.1.1.1 [which is identical to the position of regulatory Guide 1.1] may not be possible. In these cases, no additional containment pressure should be included in the determination of available NPSH than is necessary to preclude pump cavitation.

3. Standard Review Plan Section 6.2.2, “Containment Heat Removal Systems,” Revision 4, October 1985, II. Acceptance Criteria, states that

> In the recirculation phase, i.e., in the long term (after about one hour) following a LOCA, the containment spray system is required to circulate the water in the containment. The NPSH analysis will be acceptable if....(2) it is done in accordance with the guidelines of Regulatory Guide 1.1...

and,

> For subatmospheric containments, the guidelines of Regulatory Guide 1.1 as defined above will apply after the injection phase has terminated...

4. The Review Standard for Extended Power Uprates, RS-001, Revision 0 Matrix 6 references Standard Review Plan Section 6.2.2 Revision 4 and the draft version of Regulatory Guide 1.82 Revision 3 (DG-1107).

II. Proposed Changes

The following changes to the guidance are proposed.

1. Credit for containment accident pressure up to the calculated containment pressure is acceptable in calculating available NPSH for the ECCS and containment heat removal pumps. Thus, there is no consideration of crediting only a portion of the calculated pressure and of including margins above the credited pressure.

2. The credited containment accident pressure should be calculated such that it is conservatively underestimated.

3. The need for prior NRC review and approval of credit for containment accident pressure in calculating available NPSH should be determined in accordance with the requirements of 10 CFR 50.59. The staff has no *a priori* position that prior NRC review and approval is required.

4. The risk of relying on containment overpressure should be assessed.

III. Schedule

The proposed schedule for implementing these changes is given below.

1. Revise Regulatory Guide 1.1 to refer to Regulatory Guide 1.82 Revision 3. Revise Regulatory Guide 1.83 to reflect the proposed position given in II.

ACTION	DATE
Revise RG 1.1 and RG 1.82 Rev.3. Revise SRP 6.2.2 Rev. 4* and RS-0001	December 2004
DSSA Concurrence	January 2005
NRR Concurrence	February 2005
Memorandum transmitting revisions to RES, ADM, OGC, CFO	March 2005
ACRS Review of draft	April 2005
CRGR Review of draft	May 2005
RES, PMDA, Publish draft RG revisions	April 2005
Public comment period ends	July 2005
Address public comments and make revisions	September 2005
Final DSSA Concurrence	October 2005
Final NRR Concurrence	November 2005
Memorandum to RES, ADM, OGC, CFO	January 2006
Final ACRS Review	February 2006
Final CRGR Review	March 2006
RES, PMDA Publish final RG revisions, Standard Review Plan Section 6.2.2 Revision and revision to RS-001	April 2006

* Other revisions to Standard Review Plan Section 6.2.2 revision 4 may also be made such as correcting the name of the primary review branch.

IV. Resources

The estimated staff-hours to implement this action plan is 600.