



Nuclear Innovation
North America LLC
4000 Avenue F, Suite A
Bay City, Texas 77414

April 5, 2011
U7-C-NINA-NRC-110053

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Question From the March 8, 2011 Meeting With ACRS

Attached is the Nuclear Innovation North America LLC (NINA) response to a question asked during a meeting with the ACRS on March 8, 2011, related to Combined License Application (COLA) Part 2, Tier 2, Table 5.4-1a.

The COLA markup contained in this submittal will be made at the first routine COLA update following NRC acceptance of this response.

There are no commitments in this letter.

If you have any questions regarding this response, please contact Scott Head at (361) 972-7136 or Bill Mookhoek at (361) 972-7274.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 4-5-11

Mark McBurnett
Senior Vice President, Oversight & Regulatory Affairs
Nuclear Innovation North America LLC

rhs

Attachment:
ACRS Question

D091
NRD

STI 32849734

cc: w/o attachment except*
(paper copy)

Director, Office of New Reactors
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 400
Arlington, Texas 76011-8064

Kathy C. Perkins, RN, MBA
Assistant Commissioner
Division for Regulatory Services
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

Alice Hamilton Rogers, P.E.
Inspection Unit Manager
Texas Department of State Health Services
P. O. Box 149347
Austin, Texas 78714-9347

*Steven P. Frantz, Esquire
A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP
1111 Pennsylvania Ave. NW
Washington D.C. 20004

*Tekia Govan
Two White Flint North
11545 Rockville Pike
Rockville, MD 20852

(electronic copy)

*George F. Wunder
*Tekia Govan
Loren R. Plisco
U. S. Nuclear Regulatory Commission

Steve Winn
Joseph Kiwak
Jamey Seely
Eli Smith
Nuclear Innovation North America

Peter G. Nemeth
Crain, Caton & James, P.C.

Richard Peña
Kevin Pollo
L. D. Blaylock
CPS Energy

ACRS Question:

COLA table 5.4-1a states that the values for the terms used to calculate the Net Positive Suction Head (NPSH) for the Reactor Core Isolation Cooling (RCIC) pump were determined assuming 100°C as the suppression pool temperature. However, the value stated for the Vapor Pressure Head (Hvap) is not representative of a suppression pool temperature of 100 °C.

Response:

The statement in Table 5.4-1a regarding the use of 100°C in calculating “the following values” is incorrect as only the value for atmospheric head (Hatm) was calculated assuming a suppression pool temperature of 100°C. The value for H_{vap} was calculated assuming a suppression pool temperature of 77°C. The value of 100°C was assumed for suppression pool temperature as it was used in determining NPSH for the Residual Heat Removal System and the High Pressure Core Flooder System. However, since maximum suppression pool temperature during RCIC operation as identified in DCD Table 5.4-1a is 77°C, the value for Hatm should be calculated accordingly. Therefore, Table 5.4-1a will be revised as shown by gray shading on the markup below to remove the incorrect statement and return the value for Hatm to the value consistent with 77°C as shown in the DCD (10.62m).

Note that the markup also includes changes associated with the return of the maximum frictional head (H_f) value to the DCD value of 2.10m, as discussed in the supplemental response to RAI 05.04.06-3 (U7-C-STP-NRC-100145, ML101750069).

Table 5.4-1a Net Positive Suction Head (NPSH) Available to RCIC Pumps

- A. Suppression pool is at its minimum depth, El. -3740 mm.
 B. Centerline of pump suction NPSH Reference level is at El. -7200 mm.*
 C. Suppression pool water is at its maximum temperature for the given operating mode, 77°C.
 D. Pressure is atmospheric above the suppression pool.
 E. Minimum suction strainer area as committed to by Appendix 6C methods.

$$NPSH_{available} = H_{ATM} + H_S - H_{VAP} - (H_F + H_{St})$$

where:

$$H_{ATM} = \text{Atmospheric head}$$

$$H_S = \text{Static head}$$

$$H_{VAP} = \text{Vapor pressure head}$$

$$H_F = \text{Maximum frictional head including strainer excluding strainer frictional head}$$

$$H_{St} = \text{Strainer frictional head}$$

Minimum Expected NPSH
 RCIC pump flow is 182m³/h

Maximum suppression pool temperature is 77°C. However, for conservatism, 100°C is used to calculate the following values:

$$H_{ATM} = 10.62m \text{ } 10.77m$$

$$H_S = 3.46m$$

$$H_{VAP} = 4.33m \text{ } 4.39m$$

$$H_F = 2.10m$$

$$NPSH_{available} = 10.26 \text{ } 10.77 \text{ } 10.62 + 3.46 - 4.33 \text{ } 4.39 - (H_F + H_{St}) - 2.10 = 7.59m \text{ } 7.65m$$

$$NPSH_{available} = 9.84 \text{ } (H_F + H_{St})$$

$$NPSH_{required} = 7.3m \text{ } 7.0m$$

$$Margin^{**} = 0.35m \text{ } 0.84m - (H_F + H_{St}) \text{ } 0.59m = NPSH_{available} - NPSH_{required}$$

*NPSH Reference Point level is 1m above the pump floor level

**The final system design will meet the required NPSH with adequate margin.