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July 20, 2004

Docket No. 50-271
BVY 04-069

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: **Vermont Yankee Nuclear Power Station**
Technical Specification Proposed Change No. 262 – Supplement No. 13
Alternative Source Term – Standby Liquid Control System Check Valves

Dear Sir:

This letter provides additional information in support of the application by Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc. (Entergy) for a license amendment that incorporates the full scope application of an Alternative Source Term (AST) methodology to the licensing basis for the Vermont Yankee Nuclear Power Station (VYNPS). By letter dated July 31, 2003, as supplemented by letters dated October 10, 2003, November 7, 2003 (two letters), November 20, 2003, December 11, 2003 (two letters), December 30, 2003, February 10, 2004, February 18, 2004, February 25, 2004, March 17, 2004, and May 12, 2004, Entergy proposed to amend Facility Operating License No. DPR-28 for VYNPS in this regard.

The information in Attachment 1 is provided in response to a request made by the NRC staff, during a telephone conference call on July 7, 2004, regarding the reliability of check valves used in the Standby Liquid Control system.

This license amendment request supplement provides additional information to clarify Entergy's application for a license amendment and does not change the scope or conclusions in the original application, nor does it change Entergy's determination of no significant hazards consideration. There are no new commitments contained within this submittal.

If you have any questions or require additional information, please contact Mr. James DeVincentis at (802) 258-4236.

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

A001

Executed on July 20, 2004.

Sincerely,

Jay K. Thayer
Site Vice President
Vermont Yankee Nuclear Power Station

Attachment (1)

cc: Mr. Richard B. Ennis, Project Manager
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Mr. Samuel J. Collins
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Mr. David O'Brien, Commissioner
VT Department of Public Service
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Attachment 1

Vermont Yankee Nuclear Power Station

Proposed Technical Specification Change No. 262 – Supplement No. 13

Alternative Source Term

Standby Liquid Control System Check Valves

STANDBY LIQUID CONTROL SYSTEM CHECK VALVES

The VYNPS safety-related, Standby Liquid Control (SLC) system contains four Rockwell-Edward Forged Steel Univalve® Check Valves model 3674F316J. Two check valves, V-11-16 and V-11-17 serve in series as containment isolation valves. The other two check valves, V-11-43A and V-11-43B are installed at the discharge of each of the two SLC pumps (see Figure 2).

The four check valves are periodically tested in accordance with the VYNPS inservice testing program. Check valves V-11-16 and V-11-17 are full flow tested during each refueling outage, while check valves V-43A and V-11-43B are tested quarterly.

The check valve general assembly and list of materials are provided in VYNPS Drawing 5920-4471, "Rockwell-Edward Forged Steel Univalve® Check Valve – General Assembly Fig 3674F316J". The list of materials from the drawing is provided in Table 1:

Table 1
List of Materials
(where ASTM specifications are indicated the latest revision at that time were applied)

Piece #	Name	Material	Specifications
1	Body	Forged Stainless Steel	ASTM A182 Grade F316
2	Disk	CW Stainless Steel	ASTM A240/439 T316
3	Spring	STL ST Spring Wire	ASTM A313, Type 302
4	Cover	CW Stainless Steel	ASTM A240/439 T316
5	Canopy	Forged Stainless Steel	ASTM A182 Grade F316

The subject valves are 1-½" stainless steel check valves and depicted on Figure 1 below from VY Drawing 5920-4471. Figure 2 is an illustration of a typical BWR SLC system.

Figure 1
Rockwell-Edward Forged Steel Univalve® Check Valve
General Assembly Fig 3674F316J

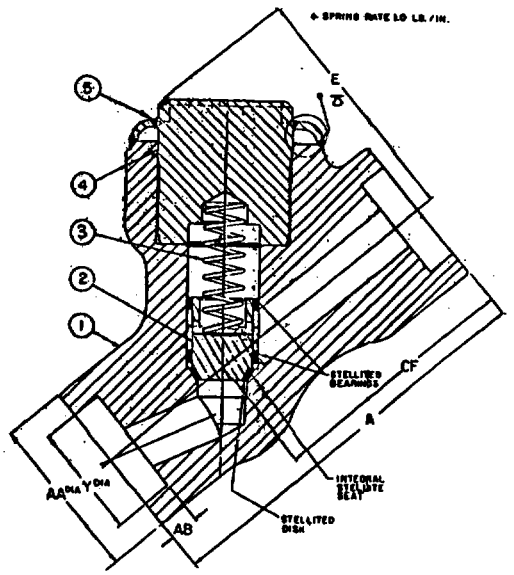
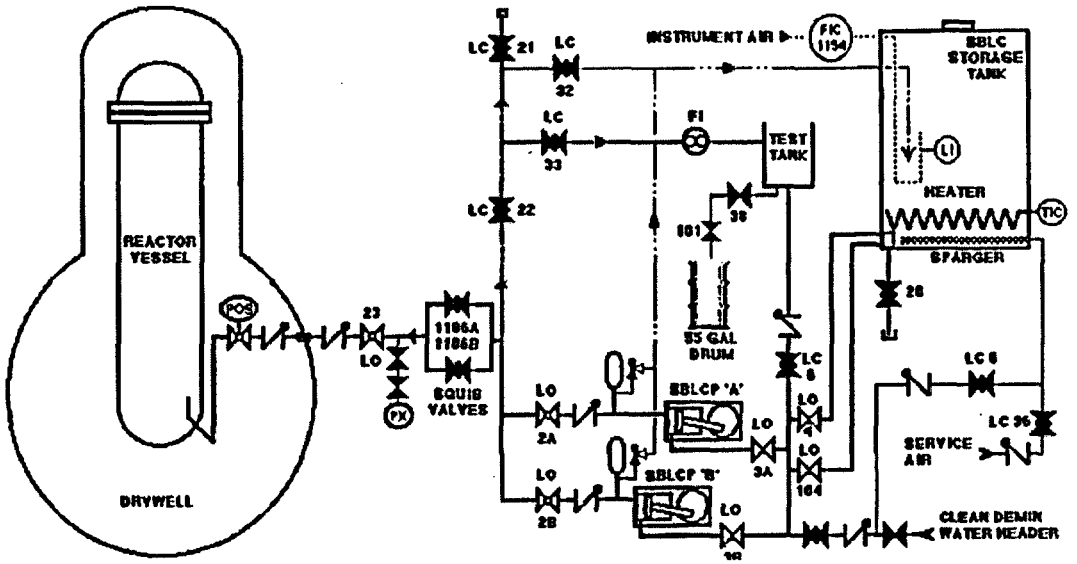


Figure 2
Typical BWR SLC System



Vermont Yankee researched the VYNPS and industry performance history of the Rockwell-Edward Forged Steel Univalve® Check Valve 3674F316J used in the BWR SLC system. The research utilized the VYNPS maintenance and surveillance records, the EPIX (Equipment Performance and Information Exchange) and NPRDS (Nuclear Plant Reliability Data System) databases.

VYNPS Records

The VYNPS SLC system contains four (4) Rockwell-Edward Forged Steel Univalve® Check Valves, Model 3674F316J. The containment isolation check valves, V-11-16 and V-11-17 are full flow tested once each refueling outage. The SLC pump discharge valves, V-11-43A and V-11-43B are tested quarterly. Both tests are performed per VY procedure OP-4114, "Standby Liquid Control System Surveillance". The tests are performed with demineralized water and the check valves are left containing demineralized water.

The review of the VYNPS maintenance and surveillance records indicate there were no failures to open for any of the SLC Rockwell-Edward Forged Steel Univalve® Check Valves Model 3674F316J.

The EPIX and NPRDS Databases

The EPIX and NPRDS databases were searched for Rockwell-Edward check valve failures involving model numbers that included "3674." The check valve population for this broad search included all check valves that met the search criteria including valves in both boiling water reactor (BWR) and pressurized water reactor (PWR) applications. The results from the database search were then filtered to obtain the check valves with a

"failure to open" (i.e., stuck-closed) failure mode, the type of interest to the SLC system since such a failure mode could prevent the injection of the sodium-pentaborate solution into the reactor vessel. The final step was to refine the search results from "failure to open" to identify BWR SLC system applications.

The refined database search revealed that no failures to open have occurred in Rockwell-Edward Forged Steel Univalve® Check Valves in SLC applications.

As documented in VY's submittal dated July 31, 2003, the broader database search found five failures recorded for two Rockwell-Edward Forged Steel Univalve® Check Valve model numbers containing "3674", namely, model numbers 3674 and 36274. The Edwards Valve Company was contacted to determine the differences between model numbers "3674" and "36274". Per the valve manufacturer, model "36274" is a re-design of the "3674" check valve. The most distinct difference is in the body-to-cover seal. Model 3674 utilized a welded canopy (Figure 1, Item 5) where as model "36274" utilized a Graphitic gasket seal ring.

The results indicate that for a "fail to open" failure mode, the failures occurred in PWR applications and were due to deposition of corrosion products, boric acid, or unspecified debris within the system or material compatibility associated with the installation. A synopsis of these failures to open is attached.

The PWR failures to open events are not applicable to the BWR SLC system check valves. The VYNPS SLC system containment isolation valves V-11-16 and V-11-17 are tested and left with demineralized water. Whereas the in the PWR applications, the valves are subjected to corrosive environments that contain boric acid.

The EPIX and NPRDS database reviews together with VYNPS performance history demonstrate the SLC system check valves are of acceptable quality and reliability.

Synopsis of EPIX and NPRDS Database Search Results

EPIX
(1/1/1997 – February 2004)

Only one (1) failure mode of "failed to open" for Rockwell-Edward check valves with model numbers containing "3674".

Salem Unit 2 (PWR): A Rockwell-Edward check valve model D36274F316FJT1 at Salem Unit 2 failed to open. The valve is installed as an isolation check valve at the reactor cooling system cold leg injection point. The valve ultimately "popped" open allowing flow. The valve was removed from service and inspected. The valve internals were found in good condition. The cause of the failure was attributed to debris in the injection line that cleared away once the flow was established.

NPRDS
(Prior to January 1, 1997)

There were 101 failures identified of Rockwell-Edward check valves with model identification numbers containing "3674." Of these failures, only four (4) had a failure mode of "failed to open." These four failures were all at PWR plants.

Surry Unit 2 (PWR): A Rockwell-Edward check valve model 3674 (3674F316J) installed in the chemical and volume control system failed to open. The failure to open is attributed to deposition of foreign material and wear of check valve internals.

Ginna 1 (PWR): A Rockwell-Edward check valve model 3674 (3674F316J) installed in the chemical and volume control system failed to open. The failure to open is attributed to deposition of solidified boric acid.

Indian Point Unit 2 (PWR): A Rockwell-Edward check valve model 3674 (3674F316J) installed in the high pressure safety injection system failed to open. The failure to open is attributed to deposition of small particles and corrosion on valve internals.

Point Beach Unit 1 (PWR): A Rockwell-Edward check valve model 3674 is described as installed on the pressurizer relief tank nitrogen supply line. The failure narrative describes the valve as constructed from carbon steel and welded on stainless steel piping. The failure to open was attributed to corrosion enhanced by the dissimilarity of the metals.

Conclusion

The PWR failures to open events are not applicable to the BWR SLC system check valves. The VYNPS SLC system containment isolation valves V-11-16 and V-11-17 are tested and left with demineralized water, whereas in the PWR applications, the valves are subjected to corrosive environments that contain boric acid.