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Responses to NRC Staff Questions Associated With
GSI 156.6.1, "Pipe Break Effects on Systems and Components"

This letter provides the Nuclear Management Company, LLC (NMC) response to NRC staff questions associated with Generic Safety Issue (GSI) 156.6.1, "Pipe Break Effects on Systems and Components." SECY 06-161, dated June 20, 2006, "A Prioritization of Generic Safety Issues" provides the current annual summary of the NRC staff's progress and prioritization of such issues.

On June 8, 2007, representatives of the NRC and NMC Point Beach Nuclear Plant (PBNP) staff participated in a telephone conference on this subject. The purpose of the telephone conference was to provide the NRC staff with additional PBNP-specific information in order for the staff to determine whether this issue could be closed for PBNP. During the telephone conference, NMC agreed to provide the NRC staff with additional technical information. The enclosure to this letter provides the requested information.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

Please contact Mr. Larry Peterson, Design Engineering Manager, at 920/755-7441 if there are additional questions associated with this submittal.

Dennis. L. Koehl
Site Vice President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC

ENCLOSURE

RESPONSE TO STAFF QUESTIONS ASSOCIATED WITH GSI 156.6.1
"Pipe Break Effects on Systems and Components"

Introduction

This letter provides the Nuclear Management Company, LLC (NMC) response to NRC staff questions associated with Generic Safety Issue (GSI) 156.6.1, "Pipe Break Effects on Systems and Components." SECY 06-161, dated June 20, 2006, "A Prioritization of Generic Safety Issues," provides the current annual summary of the NRC staff's progress and prioritization of such issues.

Main Steam and Main Feedwater Piping

The piping for these two systems inside of containment has been restrained throughout its length to prevent whipping of the pipe as a result of a break. Therefore, impact from the piping itself, whether in the vicinity of the penetrations or at other locations in containment, is not a challenge to safety-related equipment.

Main Steam and Main Feedwater Piping Penetrations

Main Steam – Penetrations P-1 and P-2

Penetrations P-1 and P-2 are located at El. 88'-0" for both units. There are two concrete floors (El. 66' and El. 46') between these penetrations and the penetrations for both trains of safety-related cables. Because of the large distance and the intervening floors, there is not a concern that a break in the main steam pipes at the penetrations could impair the cables.

Main Feedwater – Penetrations P-3 and P-4

Penetration P-4 is located at El. 61'-6" in both units. Penetration P-3 is located at El. 48'-0" in both units. Penetrations P-3 and P-4 are about 15 degrees apart radially.

Since all safety-related electrical penetrations are located at elevations below both feedwater penetrations, a postulated high energy line break (HELB) at the lower penetration (P-3) would be the bounding break. Therefore, the following discussion of a HELB is limited to a break at penetration P-3.

There is a reinforced poured concrete floor at El. 46'-0" for both units located between penetration P-3 and the safety-related electrical penetrations. In both units there is an annular gap between the floor slabs and the containment wall that is approximately 3" wide. This gap is for seismic isolation and to permit free draining of containment spray water to the containment sump.

In Unit 2, there is a cutout in the El. 46' floor that is approximately 9" deep (i.e., radially inward from the containment wall) and approximately 4' wide centered beneath penetration P-3. This cutout is surrounded by a vertical steel curb projecting approximately 3" above the floor surface. A pipe break at the anchor point for the penetration would be located further from the containment wall than the extent of the cutout. This is because the anchor is a conical support from the containment wall, and the connection weld between the conical support and the pipe is further than 12" from the containment wall. A jet originating at such a break could impinge the floor, the curb or the containment wall. A jet impinging on the floor or containment wall would be deflected close to the break, well above the elevation of the safety-related electrical penetrations located on the lower level. A jet impinging the steel curb would either be intercepted by the curb, or if the curb is not robust enough to withstand the jet blast, it would encounter the containment wall within the first few feet below the cutout.

In Unit 1, the floor cutout is approximately 3' deep (radial dimension) and 6'-6" wide (tangential dimension). The Unit 1 cutout is covered by a steel plate. The plate is estimated to be ¼" thick based on typical plant installation details. The plate is flush with the concrete floor. The plate has not been credited because it is not known whether it could withstand a potential jet blast.

Electrical Containment Penetrations:

The 58 electrical containment penetrations for each unit have been reviewed to determine the location of safety-related circuits in relation to the two limiting main feedwater pipe penetrations. Of the 58 penetrations, only 28 (14 for each unit) contain safety-related power, control and/or instrumentation circuits. Those penetrations are tabulated below, together with their azimuth and elevation coordinates.

The Q-1X and Q-2X series penetrations carry "B" train power and control, and white and yellow instrumentation channels. The Q-5X series penetrations carry "A" train power and control, and red and blue instrumentation channels. All other electrical penetrations are either spare or contain only non-safety related cables.

For Unit 1, the main feedwater pipes are located at the El. 48'-0" and El. 61'-6" elevations, at approximately 90° and 105° rotational positions, respectively. For Unit 2, the main feedwater pipes are located at the El. 48'-0" and 61'-6", and approximately 75° and 90° rotational positions, respectively. The penetrations containing safety-related cables are located as follows:

Unit 1			Unit 2		
Penetration	Elevation	Approximate Azimuth	Penetration	Elevation	Approximate Azimuth
1Q-18	48'-6"	35°	2Q-18	48'-6"	145°
1Q-19	48'-6"	35°	2Q-19	48'-6"	145°
1Q-21	48'-6"	45°	2Q-20	48'-6"	145°
1Q-22	48'-6"	45°	2Q-22	48'-6"	135°
1Q-23	44'-4"	35°	2Q-23	44'-4"	145°
1Q-24	44'-4"	35°	2Q-24	44'-4"	145°
1Q-26	44'-4"	45°	2Q-26	44'-4"	135°
1Q-27	44'-4"	45°	2Q-27	44'-4"	135°
1Q-53	22'-3"	95°	2Q-53	22'-3"	85°
1Q-54	22'-3"	95°	2Q-54	22'-3"	85°
1Q-55	19'-7"	95°	2Q-55	19'-7"	85°
1Q-56	19'-7"	95°	2Q-56	19'-7"	85°
1Q-57	16'-2"	95°	2Q-57	16'-2"	85°
1Q-58	16'-2"	95°	2Q-58	16'-2"	85°

Conclusions

The lower feedwater pipe on each unit, penetration P-3, is physically the closest to the safety-related electrical penetrations. The penetrations carrying "B" train power and control and white and yellow instrumentation channels are separated horizontally from penetration P-3 by a minimum of 45° azimuth, or approximately 40'. The horizontal separation between the environmentally qualified electrical penetrations and penetration P-3 provides enough distance for jet expansion and kinetic energy dissipation before the electrical penetrations would be impacted. It is not likely that the components served by these electrical penetrations would be rendered inoperable by a break in penetration P-3.

Based on the plant elevations, a minimum of 25'-9" of vertical distance separates penetration P-3 from the penetrations carrying "A" train power and control, and red and blue instrumentation channels. In Unit 2, there is a structural concrete floor slab between a potential break and these electrical penetrations. In Unit 1, a potential break would have to travel 25' through densely packed, non-safety-related electrical penetration canisters in order to impinge on these electrical penetrations. In either case, it is not likely that the components served by these electrical penetrations would be rendered inoperable by a break in penetration P-3.

Based on the above, it is not likely that a HELB originating at penetration P-3 could damage either grouping of safety-related electrical penetrations in either unit. It is also not likely that both redundant groups of safety-related electrical penetrations would be damaged by a single break at penetration P-3.

The potential HELBs at other main steam or main feedwater penetrations are bounded by a break at penetration P-3.