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August 17, 2018

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Serial No. 18-310
NRA/WDC R0
Docket No. 50-423
License No. NPF-49

DOMINION ENERGY NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 3
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR PROPOSED ALTERNATIVE REQUEST P-06 FOR 'C' CHARGING PUMP

By letter dated May 29, 2018, Dominion Energy Nuclear Connecticut, Inc. (DENC) requested Nuclear Regulatory Commission (NRC) approval of the proposed alternative request associated with the 'C' Charging Pump for Millstone Power Station Unit 3 (MPS3). In an email dated August 1, 2018, the NRC transmitted a request for additional information (RAI) related to the alternative request. The attachment to this letter provides DENC's response to the NRC's RAI.

If you have any questions regarding this submittal, please contact Michael Whitlock at (804) 273-3123.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering & Fleet Support

Attachment:

Response to Request for Additional Information for Proposed Alternative Request P-06 for 'C' Charging Pump

Commitments made in this letter: None

A001
NRR

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NRC Senior Resident Inspector
Millstone Power Station

ATTACHMENT

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR PROPOSED ALTERNATIVE REQUEST P-06 FOR 'C' CHARGING PUMP

MILLSTONE POWER STATION 3
DOMINION ENERGY NUCLEAR CONNECTICUT, INC.

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RAI – P-06-1

The letter for proposed alternative request P-06 states, in part:

> *Realignment of the charging pumps to support required quarterly testing results in pressure, temperature and flow transients on the reactor coolant pump (RCP) seals, which have been identified as contributors to RCP seal degradation. DENC recently identified a shift in the RCP seal differential temperature trend, which is a precursor to seal degradation. The RCP seals remain capable of performing their safety function. RCP seal replacement is planned at the next refueling outage. However, to minimize challenges to the RCP seals and to support continued plant operation, DENC requests expedited review of this proposed alternative by October 18, 2018.*

It is the NRC staff's understanding that the new RCP seals will not be degraded by the realignment of the charging pumps. Explain why this alternative request is required for the entire fourth 10-year IST interval instead of until the new RCP seals are installed on all RCPs.

DENC Response

The RCP seals are not a part of the alternative request except to establish a basis for the request for an expedited review. The increased unavailability of the High Pressure Safety Injection system function during performance of the quarterly surveillance test without a compensating increase in quality or safety is the reason for the alternative request and is applicable for the remainder of the life of the plant.

RAI – P-06-2

*It is stated in the proposed alternative request that, "if it becomes necessary to use 3CHS*P3C, a quarterly Group A test will be performed prior to declaring the pump OPERABLE."*

ISTB-3300(e)(2) in the 2001 Edition of the ASME OM Code states that, "reference values shall be established within ± 20% of pump design flow for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate shall be established at the highest practical flow rate." ISTB-3300(e)(2) in the 2012 Edition of the ASME OM Code states that, "reference values shall be established at the

*comprehensive pump test flow rate for the Group A and Group B tests, if practicable. If not practicable, the reference point flow rate can be established at the highest practical flow rate." State whether the Group A test is performed at the comprehensive pump test flow rate. If it is not, explain why not and provide the Group A test flow rate and the pump curve for 3CHS*P3C.*

DENC Response

The Group A test is not performed at the comprehensive pump test flow rate. The quarterly Group A test reference flow is 67.2 gpm, which is limited by the capacity of the fixed resistance recirculation line. The comprehensive test, which is performed during reactor cavity fill while in Mode 6, is through the common discharge header feeding the four cold leg injection lines and has a reference flow rate of 505.8 gpm. It is not possible to perform the quarterly Group A test at or near the comprehensive reference flow rate since this flow rate cannot be achieved at normal reactor coolant system operating pressure.

A copy of the charging pump performance curve from the Final Safety Analysis Report (FSAR) is attached.

RAI - P-06-3

It is stated in the proposed alternative request that, "when idle, the pump bearings will not be subjected to wear and therefore would not be expected to degrade."

*Pump 3CHS*P3C can sit idle for up to two years between comprehensive pump tests if it is not connected to a bus and tested during that two year time period. During that idle time, pump bearings can develop flat spots from inactivity. Describe what maintenance activities will be performed to prevent bearing flat spots from developing.*

DENC Response

Review of the component design confirms both the motor and pump bearings are journal type bearings and not roller type. Flat spots are not a significant concern on journal type bearings. A potential concern for long term reliability with allowing the charging pump to remain idle for extended periods of time (up to 2 years) is lack of lubrication in the motor and pump bearings. Preventive maintenance activities will be revised to include an annual requirement to manually rotate the pump and motor.

RAI - P-06-4

*It is stated in the alternative request, "Should plant operators elect to align 3CHS*P3C during an abnormal or emergency event, performance of a quarterly test may be deferred until after plant conditions are stabilized."*

*Explain how 3CHS*P3C can be aligned during an abnormal or emergency event without the performance of a quarterly test, when it is stated in the alternative request that a quarterly test is required to be performed prior to declaring the pump OPERABLE.*

DENC Response

DENC will perform the quarterly Group A test prior to declaring 3CHS*P3C OPERABLE. The statement in the submittal, *"Should plant operators elect to align 3CHS*P3C during an abnormal or emergency event, performance of a quarterly test may be deferred until after plant conditions are stabilized."* was included to recognize that there may be unanticipated emergency situations that are beyond the design basis of the plant (i.e., loss of two OPERABLE charging pumps) where operators may need to take immediate action and place the pump in service without testing in order to protect the health and safety of the public. In all other situations, DENC will perform the quarterly Group A test prior to declaring the pump operable.

RAI - P-06-5

It is stated in the alternative request:

> *Additionally, MPS3 TS Bases for entry into the 14-day allowed outage time (TS 3.8.1.1b ACTION) for an emergency power source out of service require 3CHS*P3C be available to replace an inservice charging pump, if necessary. The proposed alternate testing plan does not affect the availability of the spare pump to fulfill these functions. Charging pump 3CHS*P3C would be considered available provided a current satisfactory comprehensive test is documented.*

*TS 3.8.1.1b ACTION states, in part, that "all required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are OPERABLE..." Discuss whether or not a Group A test will be performed on 3CHS*P3C prior to it replacing an inservice charging pump, in order to declare it OPERABLE. If not, explain why not.*

DENC Response

MPS3 TS Bases requires the charging pump and charging pump cooling pump in operation be powered from the bus not associated with the out of service diesel generator. In addition, the spare charging pump will be available to replace an inservice charging pump, if necessary.

DENC will perform the quarterly Group A test prior to declaring 3CHS*P3C OPERABLE when replacing an inservice charging pump that needs to be removed from service. If the charging pump associated with the OPERABLE diesel generator becomes inoperable, applicable TS ACTIONS will apply until the Group A test is performed and 3CHS*P3C is declared OPERABLE.

RAI - P-06-6

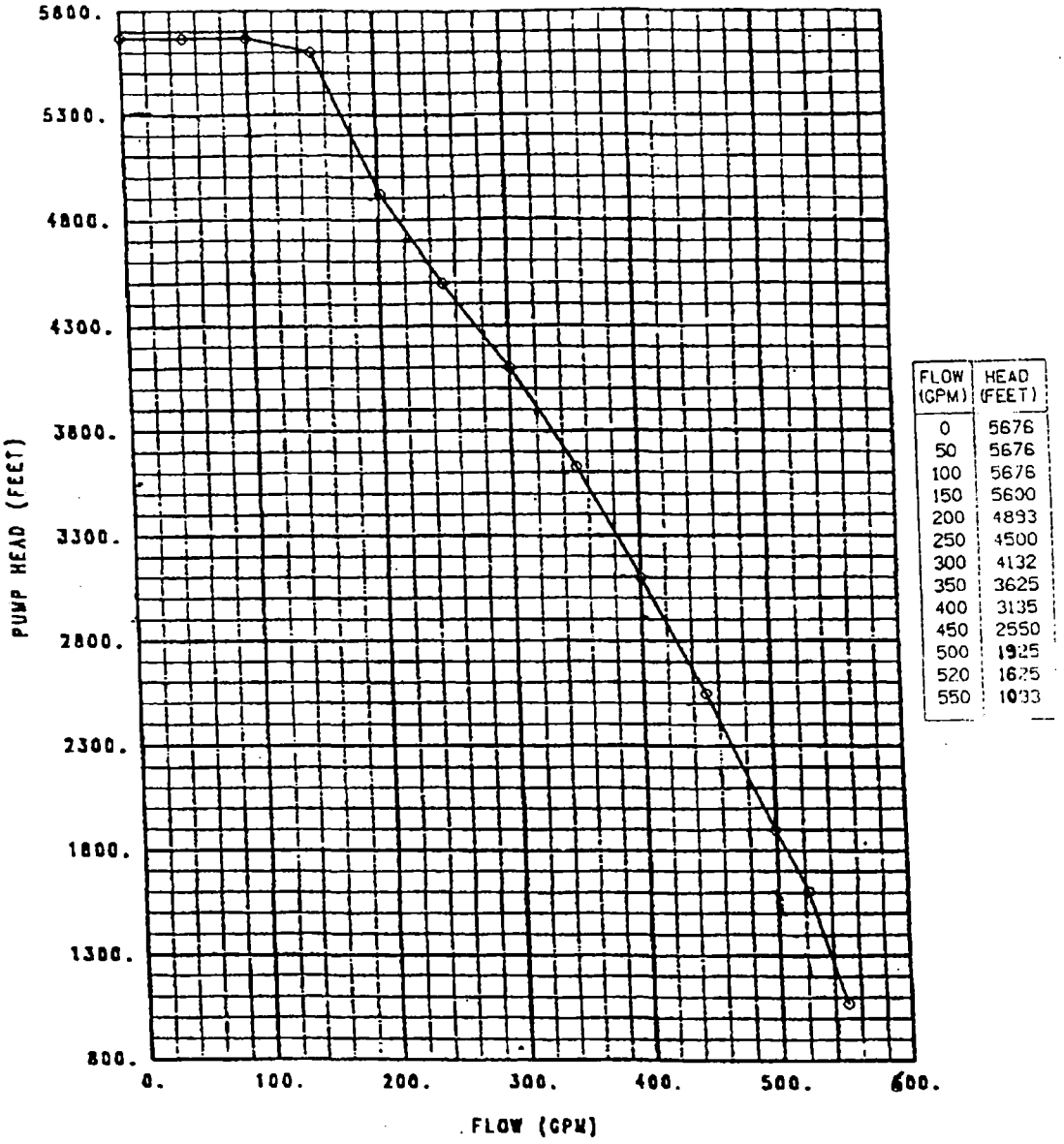
*In the alternative request, pump 3CHS*P3C is designated as a "spare" pump. Currently in licensee documents, pump 3CHS*P3C is designated as a "swing" pump. Discuss the differences between a swing pump and a spare pump, and any effect on protecting the plant if the pump is changed from a swing pump to a spare pump.*

DENC Response

The ASME OM Code Subsection ISTA 2000 and ISTB 2000 do not provide definitions for the terms "spare" or "swing". DENC has used the terms "swing" and "spare" interchangeably to describe 3CHS*P3C in licensing documents. A change to the FSAR has been prepared to consistently refer to the pump as a "spare." The change is editorial only and has no effect on protecting the plant. As stated in the alternative request, the third "spare" charging pump has no assigned FSAR Chapter 15 accident mitigation function.

MPS-3 FSAR

FIGURE 6.3–4 CHARGING PUMP CURVE ASSUMED FOR SAFETY ANALYSIS



FLOW (GPM)	HEAD (FEET)
0	5676
50	5676
100	5676
150	5600
200	4893
250	4500
300	4132
350	3625
400	3135
450	2550
500	1925
520	1675
550	1033