Public Service
Electric and Gas
Company

Thomas J. Martin
Vice President
Engineering and Construction

80 Park Plaza, Newark, NJ 07101 201-430-8316 Mailing Address: P.O. Box 570, Newark, NJ 07101

August 18, 1983

Dr. Thomas E. Murley, Administrator
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Dear Dr. Murley:

NRC IE BULLETIN NO. 83-05, DATED MAY 13, 1983
"ASME NUCLEAR CODE PUMPS AND SPARE PARTS
MANUFACTURED BY THE HAYWARD TYLER PUMP COMPANY (HTPC)"
HOPE CREEK GENERATING STATION

The subject NRC Bulletin has been reviewed by our Engineering and Hope Creek Operations Departments. The information and actions noted below apply only to the referenced safety related pumps or spare parts that were manufactured by the HTPC between 1977 and 1981 inclusive.

The answers listed below correspond to the numbers in the bulletin.

1a. Attachment 1 is a list of affected ASME code pumps and service applications.

1b. As the Inservice Testing Program (IST) is developed, the NRC's concerns and the HTPC expanded commissioning and inspection requirements (Attachment 3), including the 48 hour endurance test, will be addressed in the appropriate IST's and individual Detail Test Procedures (DTP's) for the referenced pumps.

The Inservice Inspection (ISI) requirements for HCGS safety related pumps are being developed per the guidelines and requirements of ASME Section XI, 1977 Edition with Addenda through the summer 1978. Specific tests and test requirements are outlined in the Hope Creek Pump Data Sheets being developed by Southwest Research Institute (SWRI).

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1c. Public Service has committed to performance tests in the Hope Creek FSAR. Attachment 2 compares these with the NRC recommended tests. The comparison shows three (3) deficient areas; pump to motor alignment, manual shaft rotation, and pump temperature checks. The latter two items will be incorporated as outlined in the Hayward Tyler test procedure (Attachment 3). For the pump to motor alignment we take exception to the tolerance of .002 inch. The tolerance should be based on the type of coupling used and the motor speed. The tolerances and procedures outlined in the instruction manuals and the 13th edition of The Hydraulic Institute Standards will be followed when performing the pump to motor alignment.

1d. General requirements and procedures for the hydrostatic testing of system piping are contained in Specification 10855-P-590(Q), "Technical Specification for Hydrostatic Testing of ASME Section III and ANSI B31.1 Piping Systems" and in Specific Work Plan/Procedure SWP/P-P-4, "Leak Testing of Piping Systems" (available at the HCGS job site). Detailed test procedures in the form of marked up drawings and test report forms will be prepared and implemented at the time of the test operation.

2a. The Maintenance Procedures for HCGS which will address the HTPC expanded commissioning and inspection requirements (Attachment 3) and installation of replacement parts (Attachment 4) are:

MD-CM.ED-001(Q) - Fuel Pool Cooling Pump Overhaul and Repair.

MD-CM.GB-002(Q) - Chilled Water Circulation Pumps Overhaul and Repair.

MD-CM.BC-003(Q) - HTPC ECCS Jockey Pump Replacement, Overhaul and Repair.

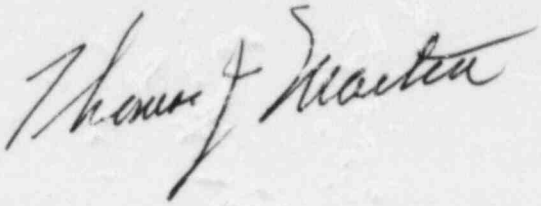
2b. See Item 1b for inservice test requirements.

2c. See Item 1c for performance test requirements.

2d. See Item 1d for plan of ASME Code System pressure test.

Should any additional information be desired, we will be pleased to discuss it with you.

Very truly yours,



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NRC Resident Inspector - Hope Creek
P.O. Box 241
Hancocks Bridge, New Jersey 08038

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ATTACHMENT NO. 1

ASME CODE PUMPS MANUFACTURED BETWEEN AND INCLUDING
THE YEARS 1977 AND 1981 BY H.T.P.C.
TO BE USED AT HOPE CREEK GENERATING STATION

Control Room Chilled Water System

Control Area

Component Name	Chilled Water Recirculation Pump
Type	Horizontal, Centrifugal
Quantity	Two
Capacity	1,330 GPM
Total Differential Head	130 Ft.
RPM	1800

Panel Rooms

Component Name	Chilled Water Recirculation Pump
Type	Horizontal, Centrifugal
Quantity	Two
Capacity	480 GPM
Total Differential Head	100 Ft.
RPM	1800

Residual Heat Removal System

Component Name	RHR/Containment Spray Jockey Pump
Type	Horizontal Centrifugal
Quantity	Two
Capacity	20 GPM
Total Differential Head	231 Ft.
RPM	3500

ATTACHMENT NO. 1

Fuel Pool System

Component Name	Fuel Pool Pump
Type	Horizontal, Centrifugal
Quantity	Two
Capacity	700 GPM
Total Differential Head	257 Ft.
RPM	3530

High Pressure Coolant Injection System

Component Name	Emergency Core Cooling System Jockey Pump
Type	Horizontal, Centrifugal
Quantity	One
Capacity	20 GPM
Total Differential Head	232 Ft.
RPM	3500

Reactor Core Isolation Cooling System

Component Name	RCIC Jockey Pump
Type	Horizontal Centrifugal
Quantity	One
Capacity	20 GPM
Total Differential Head	232 Ft.
RPM	3500

ATTACHMENT NO. 2

In the Hope Creek FSAR (Section 1.8.1.68) Public Service has committed to testing according to Regulatory Guide 1.68. The following table compares the Regulatory Guide test to the Hayward Tyler test recommended by the NRC in Bulletin 83-05 Attachment 2.

Hayward Tyler	Reg. Guide 1.68
Pump to motor alignment check	None
Manual shaft rotation to check for binding or rubbing	None
Head check	Flow and pressure test
Vibration measurement	Vibration measurement
Pump temperature check	None
Leakage check	Seal or gland leakage, seal cooling
Pump rundown check	Acceleration and coastdown check
Motor current check	Phase current check
None	Direction of rotation check
None	Motor load versus time
None	Lubrication check

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Attachments

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Hayward Tyler PUMP COMPANY

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EXPANDED COMMISSIONING TESTS AND INSPECTIONS

At the time new or rebuilt pumps are commissioned, the following tests and inspections should be made to ensure that the equipment (i.e., motors, pumps, mountings, etc.) is correctly installed and will operate properly and reliably. Some of these tests and inspections are already included in the Instruction Manuals, but in less detail than below.

A. Pre-Starting Tests

1. Pump-to-Motor Alignment

Using dial gauges, measure the pump-to-motor alignment for concentricity and trueness to parallel. Make corrections, as required, to bring both parameters to within .002 inch Total Indicated Reading (T.I.R.) for vertical pumps and .005 inch T.I.R. for horizontal pumps.

2. Rotation

With the coupling disconnected, rotate horizontal pump shafts slowly by hand, checking for signs of rubbing or binding.

B. Operational Tests

After starting the pumps take the measurements listed in Steps 1 through 5 below:

1. Head Check

The head check should be made as soon as the head has stabilized (i.e., when the pump has reached operating equilibrium and pressure gauge fluctuation has ceased). Using pressure gauges on the pump suction and discharge pipes, measure the differential pressure across the pump and calculate the pump head. Adjust the discharge valve to obtain a head which corresponds to the normal flow condition on the pump performance test curve (provided in the pump data package).

2. Vibration Measurement

The vibration measurements should be taken once the pump has been set at the desired head and flow and should be made consistent with Hydraulics Institute guidelines. Using a vibration meter, measure the pump vibration on the bearing housing (for horizontal pumps) or at the top of the motor (for vertical pumps). These readings should be within Hydraulics Institute limits.

Note: At minimum flow (see following page), a slight increase in vibration is normal and should be expected.

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EXPANDED COMMISSIONING TESTS AND INSPECTIONS

3. Temperature Check

The temperature check for horizontal and vertical pumps should be conducted some 10-15 minutes after the temperature to be measured has stopped rising (slight fluctuations in temperature will occur due to changes in conditions localized in the pump, but the upward trend from start-up should be ceased).

For horizontal pumps, run the pump for sufficient time for the pump bearing temperature to stabilize. This temperature should be no more than ambient temperature plus 90 F° (e.g., if ambient temperature is 70° F bearing temperature should be no more than 160° F).

For vertical pumps, check the packing gland for excessive temperature. The gland temperature should not exceed that of the pumped fluid or seal water by more than 20F°.

4. Motor Current

Using a clamp-on ammeter or another suitable current measurement device, check the motor current in each phase for uniformity. Using these readings and the motor nameplate data, calculate the pump horsepower and compare this with the pump performance test curve (the difference should be no more than 10%) and check for a motor overload condition.

5. Leakage Check

During pump operation, check the pump for any leaks at joints and the mechanical seal. This check should take approximately 5 minutes. A small leakage is required for proper operation of the seal, but this should not exceed a few cc's per minute. Seepage at the packing gland is normal.

Upon completion of Steps 1 through 5 at normal flow, repeat at minimum and runout flow.

C. Pump Rundown Check

Adjust the discharge valve to operate the pump at normal flow conditions and stop the motor. Carefully note the rundown time and check to see whether the pump runs down smoothly. A short rundown indicates a potential problem. If identical pumps do not have consistent rundown times, repeat the pre-starting checks to verify correct alignment and rotation.

D. Evaluation of Results

The results of the foregoing tests and inspections should be evaluated by a qualified engineer against the contract requirements and the results of the pump performance test previously conducted at Hayward Tyler for

ATTACHMENT 4

Hayward Tyler
PUMP COMPANY

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INSTALLATION OF REPLACEMENT PARTS

For reassembly of pumps using new parts, the following additional steps will be required.

1. New pump parts such as keys, sleeves, glands, impellers and shafts may require hand fitting in order to mate exactly with existing parts and to provide a snug fit. Such hand fitting is also normal procedure during original assembly of the pump. For example, the key is intentionally machined slightly large so that it can then be hand fitted to mate exactly with the shaft and impeller without any looseness. Ordinarily, such fitting will involve the use of hand files, a portable hone, or emery cloth, depending upon the part involved and the amount of material to be removed for proper fitting.

2. After installation of a new wear ring on an impeller, the wear ring should be checked for concentricity with the shaft. This can be done by spinning the shaft and impeller and indicating the wear ring with a dial gauge. The maximum allowable eccentricity is 0.004 inch Total Indicated Reading.

3. Spare impellers will be supplied at the same diameter as the original impeller in the pump for which the spare is bought. However, if the customer has more than one identical pump, it may be advantageous to order spare impellers with a maximum diameter and trim them during assembly to fit the specific pumps in which they are to be installed. The final diameter of the original impeller is shown on the Hayward Tyler performance test curve.

If there are any questions concerning the foregoing, contact Hayward Tyler.

STATE OF NEW JERSEY)
) SS: COUNTY OF ESSEX
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THOMAS J. MARTIN, being duly sworn according to law deposes and says:

I am a Vice President of Public Service Electric and Gas Company, and as such, I find the matters set forth in our response dated August 18, 1983, to Bulletin No. 83-05, "ASME Nuclear Code Pumps and Spare Parts Manufactured by the Hayward Tyler Pump Company," are true to the best of my knowledge, information, and belief.

Thomas J. Martin
THOMAS J. MARTIN

Subscribed and sworn to before me
this 18 day of August, 1983

David K. Burd
Notary Public of New Jersey

My Commission expires on _____

DAVID K. BURD
NOTARY PUBLIC OF NEW JERSEY
My Comm. Expires 10-23-85

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