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SUBJECT: Discusses inservice testing program for pumps & valves & forwards revised relief requests covering standby svc water sys,LPCS,RHR,HPCS & RCIC sys & main steam sys.Original requests denied by NRC in 920923 ltr.

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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December 22, 1992
GO2-92-269

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21
INSERVICE TESTING PROGRAM FOR
PUMPS AND VALVES (TAC NO. 60493)**

References:
1) Letter dated September 23, 1992, TR Quay (NRC) to GC Sorensen (SS), "Denial of Relief Requests to Inservice Testing (IST) Program for Pumps (RP-7) and Check Valves (RV-26) at WPPSS Nuclear Project No. 2 (TAC No. M82292)"
2) Letter G02-91-220 dated December 3, 1991, GC Sorensen (SS) to NRC, "WNP-2 Inservice Testing Program for Pumps and Valves (TAC No. 60493)"
3) Letter dated May 7, 1991, PL Eng (NRC) to GC Sorensen (SS), "Safety Evaluation of the Washington Public Power Supply System Nuclear Project No. 2 (WNP-2) Inservice Testing Program for Pumps and Valves (TAC No. 60493)"
4) Letter dated October 7, 1992, KE Perkins (NRC) to AL Oxsen (SS), "NRC Systematic Test Performance Team Inspection Report No. 50-397/92-25"

In Reference 1, the NRC denied proposed relief requests RP-7 and RV-26 which were submitted with Reference 2 letter. Relief request RP-7 proposed using a reference curve for testing pumps instead of a fixed reference point; and relief request RV-26 sought to test closure of check valves SLC-V-33A and 33B during refueling outages instead of every quarter.

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Relief request RP-7 was denied because the NRC staff does not consider that the use of pump curves provides an equivalent level of quality and safety to the use of fixed reference values. Reference 1 states that for specific cases where the licensee believes there is adequate justification for the impracticality of meeting the Code requirements, new relief requests should be submitted within 90 days of the date of Reference 1 letter.

The Supply System has evaluated all pumps included in the IST Program and is requesting approval of the following two new relief requests for using a reference curve for testing specific pumps instead of a fixed reference point. Relief request RP-7 is being deleted from the IST Program Plan.

Relief Request RP-8

Pumps: SW-P-1A, SW-P-1B, HPCS-P-2

Design of WNP-2 Service Water System and the Technical Specification requirements make it impractical to adjust system flow to a fixed reference value for inservice testing without adversely affecting the system flow balance and Technical Specification operability requirements. Proposed alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and will adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

Relief Request RP-9

Pumps: LPCS-P-1, RHR-P-2A, RHR-P-2B, RHR-P-2C, HPCS-P-1, RCIC-P-1

Flow rate for these pumps cannot be readily duplicated with the existing flow control systems. Flow control for these systems can only be accomplished through the operation of relatively large motor operated globe valves as throttling valves. Because these valves are not equipped with position indicators which reflect percent open, the operator must repeatedly jog the motor operator to try to make even minor adjustments in the flow rate. These efforts, to exactly duplicate the reference value, require excessive valve manipulation which could ultimately result in damage to valves or motor operators. Thus due to impracticality and difficulty of adjusting independent variables (flow rate, and speed for variable drive RCIC pump) to a fixed reference value for inservice testing without system modifications, alternate testing to vary the variables over a very narrow range ($\pm$ 1% of reference values) and using pump reference curves for this narrow range is being proposed. Alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and will adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

The Supply System has reevaluated relief request RV-26 for the back flow closure testing of Standby Liquid Control (SLC) pump discharge check valves SLC-V-33A and 33B and is deleting this relief request from the IST Program Plan. These valves will be verified closed quarterly by employing non-intrusive techniques (ultrasonic testing, radiography etc.).

Relief Request RP-10

Instruments: discharge pressure instruments for pumps RHR-P-2A, 2B, 2C and HPCS-P-1

In Reference 4, the Supply System was issued a Notice of Violation (NOV) pertaining to RHR-P-2A pump discharge pressure instrument not meeting the full scale range requirements of subarticle IWP-4120 of Section XI of the ASME Code. Following the identification of this violation, the Supply System reviewed the instrumentation used in other Section XI pump testing. A Basis for Continued Operation (BCO) and 10 CFR 50.59 review was performed for instruments not meeting the Code range requirements. In response to corrective action for this NOV, the relief request RP-10 is being submitted for approval.

Transient Data Acquisition System (TDAS) is being used to measure the discharge pressure of RHR and HPCS pumps. The accuracy of the TDAS data is $\pm$ 1% of full scale. These data are consistently more accurate than would be provided by instruments meeting the Code instrument accuracy requirement of $\pm$ 2% of full scale and range requirements of 3 times the reference value. TDAS converts the output signal from the pressure transmitter into a digital format and thus can indicate discharge pressure with the same accuracy and readability over the entire calibrated range. The output of TDAS is identical to a digital instrument with a digital readout; full scale range requirements are not applicable for digital instruments according to later Code editions.

Relief Request RV-13

Valves: MS-RV-3D, 4A, 4B, 4C, 4D, 5B and 5C

A new valve position indication (VPI) system was installed on the SRVs during the 1992 refueling outage. This modification has affected the information provided in previously granted relief request RV-13. Relief request RV-13 has been updated based on this modification and is being submitted for reapproval.

The new VPI system is currently being used in parallel with the existing acoustic monitor system to determine SRV stem position directly. The new system does not drive the valve position indicating lights located next to the SRV control switches on control room panel; these position indicating lights are still driven by the acoustic monitor system. Even though the new valve position indication system provides an improved method of determining valve position over the acoustic monitor method, there is still no effective means of measuring accurate or meaningful stroke time of SRVs. Installing temporary recorders between position indicating lights and SRV control switch will be very cumbersome and unsafe to the normal traffic in the control room as the two panels are approximately 30 feet apart. Measurement of stroke time would require a major modification in the plant control room.

Sincerely,

G. C. Sorensen, Manager
Regulatory Programs (Mail Drop PE20)

RR/bk
Attachments

cc: JB Martin - NRC RV
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Site Inspector - 901A

RELIEF REQUEST NO. RP-8

System: Standby Service Water

Pumps:

Pump	Code Class	P & I D Dwg. Number
SW-P-1A	3	M524, SH 1
SW-P-1B	3	M524, SH 2
HPCS-P-2	3	M524, SH 1

Section XI Code Requirements For Which Relief is Requested:

IWP-3100 requires that the system resistance be varied until either the measured differential pressure or measured flow rate equals the corresponding reference value. The quantities of Table IWP-3100-1 are then measured or observed and compared to the corresponding reference value.

Basis for Relief:

1. Service Water systems are designed such that the total pump flow cannot be adjusted to one finite value for the purpose of testing without adversely affecting the system flow balance and Technical Specification operability requirements. Thus these pumps must be tested in a manner that the service water loop remains properly flow balanced during and after the testing and each supplied load remains fully operable per Technical Specifications to maintain the required level of plant safety during power operation.

2. The service water system loops are not designed with a full flow test line with a single throttle valve. Thus the flow cannot be throttled to a fixed reference value every time. Total pump flow rate can only be measured using the total system flow indication installed on the common return header. There are no valves in any of the loops, either on the common supply or return lines, available for the purpose of throttling total system flow. Only the flows of the served components can be individually throttled. Each main loop of service water supplies 17-18 safety related loads, all piped in parallel with each other. The HPCS-P-2 pump loop supplies four loads, each in parallel. Each pump is completely independent from the others (no loads are common between the pumps). Each load is throttled to a FSAR required flow range which must be satisfied for

Relief Request RP-8 (Continued)

the load to be operable. All loads are aligned in parallel, and all receive service water flow when the associated service water pump is running, regardless of whether the served component itself is in service. During power operation, all loops of service water are required to be operable per Technical Specifications. A loop of service water cannot be taken out of service for testing without entering an Action Statement for a Limiting Condition for Operation (LCO). Individual component flows outside of the FSAR mandated flow ranges also induce their own Technical Specification action statements that in turn can induce full plant shutdown in as little as two hours, depending on the load in question.

3. Each loop of service water is flow balanced before exiting each annual refueling outage to ensure that all loads are adequately supplied. A flow range is specified for each load to balance all the flows against each other. Once properly flow balanced, very little flow adjustment can be made for any one particular load without adversely impacting the operability of the remaining loads (increasing flow for one load reduces flow for all the others). Each time the system is flow balanced, proper individual component flows are produced, but this in turn does not necessarily result in one specific value for total flow. Because each load has an acceptable flow range, overall system full flow (the sum of the individual loads) also has a range. Total system flow can conceivably be in the ranges of 9247 - 10,079 GPM for SW-P-1A pump, 9212 - 10,043 GPM for SW-P-1B pump, and 1050 - 1158 GPM for HPCS-P-2 pump. Consequently, the desire to quarterly adjust service water loop flow to one specific flow value for the performance of inservice testing conflicts with system design and component operability requirements (i.e. flow balance) as required by Technical Specifications.

Alternate Testing to be Performed:

As discussed above in the basis for relief section, it is extremely difficult or impossible to return to a specific value of flow rate or differential pressure for testing of these pumps. Multiple reference points could be established according to the Code, but it would be impossible to obtain reference values at every possible point, even over a small range. An alternate to testing requirements of IWP-3100 is to base the acceptance criteria on a reference curve. Flow rate and discharge pressure are measured during inservice testing in the as found condition and compared to an established reference curve. Discharge pressure instead of

Relief Request RP-8 (Continued)

differential pressure is used to determine pump operational readiness as allowed by Relief Request RP-3 (Relief granted per SER/TER Reference 2.3.1, dated May 7, 1991). The following elements are used in developing and implementing the reference pump curves.

1. A reference pump curve (flow rate vs discharge pressure) has been established for SW-P-1A and SW-P-1B from data taken on these pumps when they were known to be operating acceptably. These pump curves represent pump performance almost identical to preoperational test data. The methodology employed for establishing a reference pump curve is similar to that for performing a comprehensive test being proposed by the OM Code Committee.

2. Pump curves are based on seven or more test points beyond the flat portion of the curve (at flow rate greater than 4800 gpm). Rated capacity of these pumps is 12,000 gpm. Three or more test data points were at flow rate greater than 9,000 gpm. The pumps are being tested at full design flow rate.

3. To reduce the uncertainty associated with the pump curves and the adequacy of the acceptance criteria, special test gauges (±0.5% full scale accuracy) were installed to take test data in addition to plant installed gauges and Transient Data Acquisition System (TDAS). All instruments used either met or exceeded the Code required accuracy.

4. For HPCS-P-2 pump, the reference pump curve is based on the manufacturer's pump curve which was validated during the preoperational testing.

5. Review of the pump hydraulic data trend plots indicates close correlation with the established pump reference curves, thus further validating the accuracy and adequacy of the pump curves to assess pumps operational readiness.

6. The reference pump curves are based on flow rate vs discharge pressure. Acceptance criteria curves are based on differential pressure limits given in Table IWP-3100-2. Setting the Code Acceptance Criteria on discharge pressure using differential limits is slightly more conservative for these pump installations with suction lift (Relief Request RP-3, SER/TER Reference 2.3.1, dated May 7, 1991). See the attached sample SW-P-1A pump Acceptance Criteria sheet. Area 1-2-3-4 is the acceptable range for pump performance. Areas outside 1-2-3-4 but within 5-6-7-8 define the Alert Range, and the areas outside 5-6-7-8 define the

Relief Request RP-8 (Continued)

required Action Range. These acceptance criteria limits do not conflict with Technical Specifications or Final Safety Analysis Report operability criteria.

7. Only a small portion of the established reference curve is being used to accommodate flow rate variance due to flow balancing of various system loads.

8. Review of vibration data trend plots indicates that the change in vibration readings over the narrow range of pump curves being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

9. After any maintenance or repair that may affect the existing reference pump curve, a new reference pump curve shall be determined or the existing pump curve revalidated by an inservice test. New reference pump curve shall be established based on at least 5 points beyond the flat portion of the pump curve.

Implementing Schedule:

These pumps are being tested quarterly using a pump reference curve. This relief request supersedes the testing requirements specified in Relief Request RP-7 which was denied by the NRC per SER dated September 23, 1992 (TAC No. M82292).

Quality/Safety Impact:

Design of WNP-2 Service Water System and the Technical Specifications requirements make it impractical to adjust system flow to a fixed reference value for inservice testing without adversely affecting the system flow balance and Technical Specification operability requirements. Proposed alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and shall adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

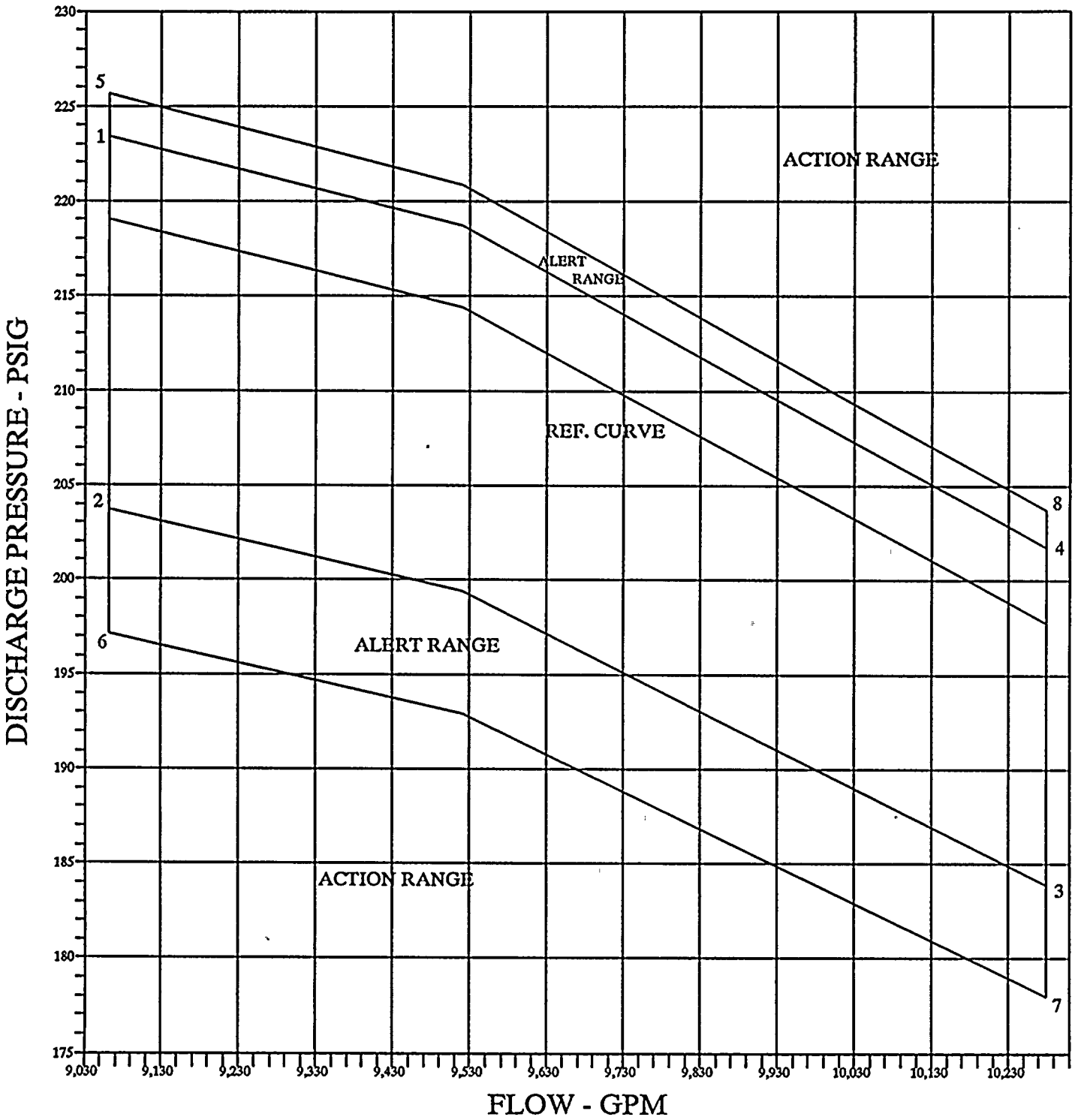
NRC Acceptance:

Pending

Relief Request RP-8 (Continued)

SAMPLE DATA SHEET

SW-P-1A ACCEPTANCE CRITERIA



ALERT RANGE - Area Outside 1-2-3-4

ACTION RANGE - Aera Outside 5-6-7-8

RELIEF REQUEST NO. RP-9

Systems: Low Pressure Core Spray (LPCS),
Residual Heat Removal (RHR),
High Pressure Core Spray (HPCS) and
Reactor Core Isolation Cooling (RCIC)

Pumps:

Pump	Code Class	P & I D Dwg. Number
LPCS-P-1	2	M520
RHR-P-2A	2	M521, SH 1
RHR-P-2B	2	M521, SH 2
RHR-P-2C	2	M521, SH 2
HPCS-P-1	2	M520
RCIC-P-1	2	M519

Section XI Code Requirements For Which Relief is Requested:

IWP-3100 requires that the system resistance be varied until either the measured differential pressure or measured flow rate equals the corresponding reference value. The quantities of Table IWP-3100-1 are then measured or observed and compared to the corresponding reference value.

Basis for Relief:

Reference values are defined as one or more fixed sets of values of quantities as measured or observed when the equipment is known to be operating acceptably. All subsequent test results are to be compared to these reference values. Based on the operating experience, flow rate (independent variable during inservice testing) for these pumps cannot be readily duplicated with the existing flow control systems. Flow control for these systems can only be accomplished through the operation of relatively large motor operated globe valves as throttling valves. Because these valves are not equipped with position indicators which reflect percent open, the operator must repeatedly jog the motor operator to try to make even minor adjustments in flow rate. These efforts, to exactly duplicate the reference value, would require excessive valve manipulation which could ultimately result in damage to valves or motor operators.

Relief Request RP-9 (Continued)

Alternate Testing to be Performed:

As discussed above in the basis for relief section, it is extremely difficult or impossible to return to a specific value of flow rate or differential pressure for testing of these pumps. Since the independent reference variable (flow rate) for these pumps is very difficult to adjust to a fixed reference value and requires excessive valve manipulation, the maximum variance shall be limited to ± 1% of the reference value. Thus flow rate shall be adjusted to be within ± 1% of the reference flow rate and the corresponding differential pressure shall be measured and compared to reference differential pressure value determined from the pump reference curve established for this narrow range of flow rate. Slope of the pump reference curve is not flat even over this narrow range of flow rate. Assuming the flow rate to be fixed over this narrow range can result in additional error in calculating the deviation between the measured and reference differential pressure and at times this deviation can be non-conservative. ASME Section XI allows establishing multiple reference points but does not specify any variance from the fixed reference values. Since the dependent variable (differential pressure) can be assumed to vary linearly with flow rate in this narrow range, establishing multiple reference points in this narrow range is similar to establishing a reference pump curve representing multiple reference points. This assumption of linearity between differential pressure and flow rate is supported by the manufacturer pump curves in the stable design flow rate region. For RCIC-P-1 pump both flow rate and speed are adjusted to be within ± 1% of their respective reference values and the differential pressure is measured. The following elements are used in developing and implementing these reference curves.

1. A reference pump curve (flow rate vs differential pressure) has been established for RHR pumps from data taken on these pumps when they were known to be operating acceptably. These pump curves represent pump performance almost identical to manufacturer's test data. The methodology employed for establishing a reference pump curve is similar to that for performing a comprehensive test being proposed by the OM Code Committee.

2. For RCIC-P-1, a variable speed drive pump, flow rate is set within ± 1 of reference flow rate of 606 gpm and the reference curve is based on speed with acceptance criteria based on differential pressure. This is done because of the difficulty in setting speed to a specific reference value as specified by the Code.

Relief Request RP-9 (Continued)

Additionally, evaluation of manufacturer pump data, preoperational and special test data used to establish pump reference curve indicates insignificant change (0.25 psi/gpm) in differential pressure with small variation (± 6 gpm) in flow rate.

3. For HPCS-P-1 and LPCS-P-1 pumps, the reference pump curve is based on the manufacturer pump curve which was validated during the preoperational testing.

4. RHR and RCIC pump curves are based on seven or more test points beyond the flat portion of the curve. These ECCS pumps have a minimum flow rate requirements specified in Technical Specifications and are being tested at full design flow rate.

5. To reduce the uncertainty associated with the pump curves and the adequacy of the acceptance criteria, special test gauges (±0.5% full scale accuracy) were installed to take test data in addition to plant installed gauges and Transient Data Acquisition System (TDAS). All instruments used either met or exceeded the Code required accuracy.

6. Review of the pump hydraulic data trend plots indicates close correlation with the established pump reference curves, thus further validating the accuracy and adequacy of the pump curves to assess pumps operational readiness.

7. Acceptance criteria curves are based on differential pressure limits given in Table IWP-3100-2. See the attached sample RHR-P-2A pump Acceptance Criteria sheet. Area 1-2-3-4 is the acceptable range for pump performance. Areas outside 1-2-3-4 but within 5-6-7-8 define the Alert Range, and the areas outside 5-6-7-8 define the required Action Range. These acceptance criteria limits do not conflict with Technical Specifications or Final Safety Analysis Report operability criteria.

8. Only a small portion of the established reference curve is being used to accommodate flow rate variance.

9. Review of vibration data trend plots indicates that the change in vibration readings over the narrow range of pump curves being used is insignificant and thus only one fixed reference value has been assigned for each vibration location.

Relief Request RP-9 (Continued)

10. After any maintenance or repair that may affect the existing reference pump curve, a new reference pump curve shall be determined or the existing pump curve revalidated by an inservice test. New reference pump curve shall be established based on at least 5 test points beyond the flat portion of the pump curve.

Implementing Schedule:

These pumps are being tested quarterly using a pump reference curve. This relief request supersedes the testing requirements specified in Relief Request RP-7 which was denied by the NRC per SER dated September 23, 1992 (TAC No. M82292).

Quality/Safety Impact:

Due to impracticality and difficulty of adjusting independent variables (flow rate, and speed for variable drive RCIC pump) to a fixed reference value for inservice testing without system modifications, alternate testing to vary the variables over a very narrow range (± 1% of reference values) and using pump reference curves for this narrow range is being proposed. Alternate testing using a reference pump curve for each pump provides adequate assurance and accuracy in monitoring pump condition to assess pump operational readiness and shall adequately detect pump degradation. Alternate testing will have no adverse impact on plant and public safety.

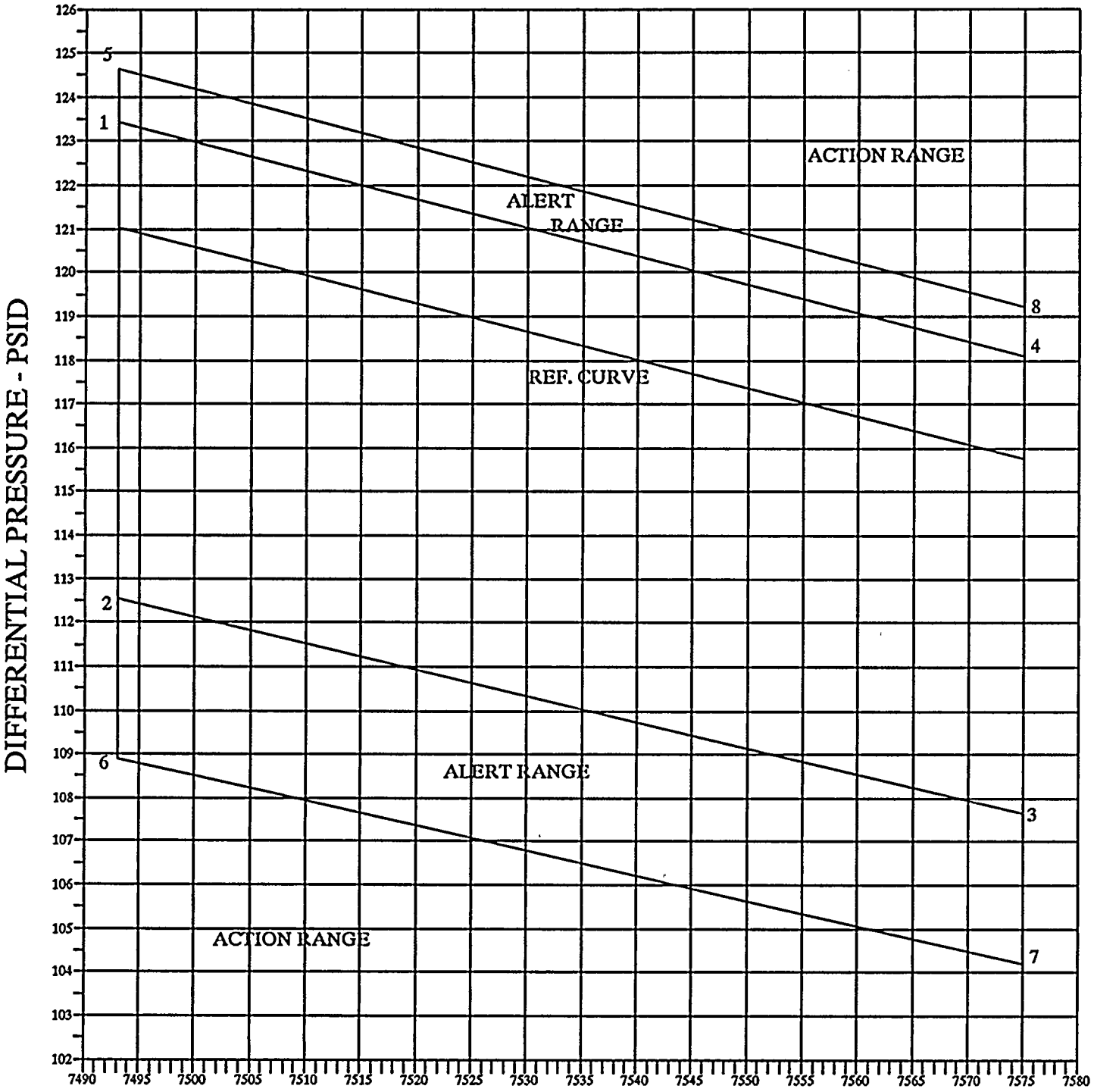
NRC Acceptance:

Pending

Relief Request RP-9 (Continued)

SAMPLE DATA SHEET

RHR-P-2A ACCEPTANCE CRITERIA



ALERT RANGE - Area Outside 1-2-3-4

ACTION RANGE - Aera Outside 5-6-7-8

RELIEF REQUEST NO. RP-10

Systems: Residual Heat Removal (RHR) and High Pressure Core Spray (HPCS)

Pumps:

Pump	Code Class	Test Parameter	Instrument I.D.	Range (PSIG)	Ref. Value (PSIG)	Instrument Loop Accuracy
RHR-P-2A	2	Discharge Pressure	RHR-PT-37A TDAS PT 155	0-600	136	± 1%, ± 6 psig
RHR-P-2B	2	Discharge Pressure	RHR-PT-37B TDAS PT 076	0-600	132	± 1%, ± 6 psig
RHR-P-2C	2	Discharge Pressure	RHR-PT-37C TDAS PT 091	0-600	143	± 1%, ± 6 psig
HPCS-P-1	2	Discharge Pressure	HPCS-PT-4 TDAS PT 107	0-1500	430	± 1%, ± 15 psig

Section XI Code Requirements For Which Relief is Requested

IWP-4120 Range, the full scale range of each instrument shall be three times the reference value or less.

Basis for Relief:

1. Article IWP-4000 specifies both accuracy and range requirements for each instrument used in measuring pump performance parameters. The purpose of instrument requirements is to ensure that pump test measurements are sufficiently accurate and repeatable to permit evaluation of pump condition and detection of degradation. Instrument accuracy limits the inaccuracy associated with the measured test data. Thus higher instrument accuracy lowers the uncertainty associated with the measured data. The purpose of the Code range requirement is to ensure reading accuracy and repeatability of test data.

Relief Request RP-10 (Continued)

2. Transient Data Acquisition System (TDAS) converts output signal from the pressure transmitter into a digital format and thus can indicate discharge pressure with the same accuracy and readability over the entire calibrated range. Since the output of TDAS is identical to a digital instrument with a digital readout, full scale range requirements are not applicable for digital instruments according to later Code editions.

3. Since the TDAS data is being obtained to an accuracy of ±1% of full scale, it consistently yields measurements more accurate than would be provided by instruments meeting the Code instrument accuracy requirement of ±2% of full scale and range requirement of three times the reference value. Equivalent Code accuracy being obtained by TDAS measurements is calculated below.

Pump	Test Parameter	Instr. I.D.	Range (PSIG)	Ref. Value (PSIG)	Instr. Loop Accuracy	Equivalent Code Accuracy
RHR-P-2A	Discharge Pressure	RHR-PT-37A TDAS PT 155	0-600	136	± 1%, ± 6 psig	6/(3x136)x 100=1.47%
RHR-P-2B	Discharge Pressure	RHR-PT-37B TDAS PT 076	0-600	132	± 1%, ± 6 psig	6/(3x132)x 100=1.52%
RHR-P-2C	Discharge Pressure	RHR-PT-37C TDAS PT 091	0-600	143	± 1%, ± 6 psig	6/(3x143)x 100=1.40%
HPCS-P-1	Discharge Pressure	HPCS-PT-4 TDAS PT 107	0-1500	430	± 1%, ± 15 psig	15/(3x430) x100=1.16%

Thus the range and accuracy of TDAS instruments being used to measure pump discharge pressure results in data measurements of higher accuracy to that required by the Code and thus should provide reasonable assurance of pumps operational readiness. It should also be noted that the TDAS system averages many readings therefore giving a significantly more accurate reading than would be obtained by visual observation of a gauge.

Relief Request RP-10 (Continued)

4. Installing temporary test gauges every quarter to obtain discharge pressure readings would be burdensome and costly and would not provide pressure measurement that is any more accurate and reliable. Additionally, using different test gauges for IST from one test to another may introduce its unique systematic error and thus affect the quality and repeatability of test data.

Alternate Testing to be Performed:

During quarterly pump inservice testing, pump discharge pressure which is used to determine differential pressure shall be measured by respective TDAS points listed above for each pump.

Quality/Safety Impact:

TDAS data will consistently provide acceptable accuracy to ensure that the pumps are performing at the flow and pressure conditions to fulfill their design function. TDAS data is sufficiently accurate for evaluating pump condition and in detecting pump degradation. The effect of granting this relief request will have no adverse impact on plant and public safety. Test quality will be enhanced by getting slightly better, more trendable data.

NRC Acceptance:

Pending

RELIEF REQUEST NO. RV-13 (Revised, December 16, 1992)

System	Main Steam
Valves	MS-RV-3D, 4A, 4B, 4C, 4D, 5B, 5C
ASME Classification	Code Class: 1 Category: BC
Function	These valves form the Auto-Depressurization System and, as such, function to relieve reactor vessel pressure to the extent that the low pressure coolant injection system could be brought on line and perform its safety function.
Code Testing Requirement	1. IWV-3411, Test Frequency 2. IWV-3413, Stroke Time of Power Operated Valves
Basis for Relief	1. Valve exercise on a quarterly basis during power operations could cause power transients resulting in a reactor shutdown. Valve testing at cold shutdown conditions is not desirable because of resulting damage to the valve seats. It is not desirable to test more frequently than refueling outages to reduce the number of challenges to the valves. 2. Thermocouples are installed in the exhaust piping to provide indication as to whether or not the valve is properly seated. Acoustic monitors are also installed on the exhaust piping to provide indirect valve position indication. This indication lags actual valve position and is not accurate at reduced pressures. 3. During a 1992 refueling outage plant modification, new SRV stem position indication instrumentation system was installed on all the SRV's. This new valve position indication (VPI) system is currently being used in parallel with the existing acoustic monitor system to determine SRV stem position directly. The new system does not drive the valve position indicating lights located next to the SRV control switches on control room panel; these position indicating lights are still driven by the acoustic monitor system.

Relief Request No. RV-13 (Continued)

The new VPI system has its own set of indicating lights on a small panel which is approximately 30 feet away from the SRV control switches and the view is obstructed by counters, desks, computers and normal personnel traffic in the control room. The VPI lights cannot be seen from the control switches. Thus it is impossible to measure the stroke time of SRV's using a stopwatch. Relaying switch and/or VPI indicating light changes between two or more operators is not feasible since the SRV's are fast acting in both the opening and closing directions (open time 0.02 to 0.15 seconds; closing time less than 1.5 seconds per Crosby Tech Manual). Human reaction time will mask the actual valve stroke time. There is no other means of measuring valve stroke time without significant system modification.

Alternate Testing to be Performed

The valves will be exercised at least once every 18 months in accordance with WNP-2 Technical Specification. The valves will be verified fully open and closed based on available instrumentation and appropriate system response. The new valve position indication system provides an improved method of determining valve position over the acoustic monitor method. Additionally, the performance of subarticle IWV-3300 requirements verifies that the valve operation is accurately indicated based on the position indicating lights and appropriate system response.

Quality/Safety Impact

The proposed alternate testing adequately evaluates the operational readiness of these valves commensurate with their safety function. This will help reduce the number of challenges and failures of safety relief valves and still provide timely information regarding operability and degradation. This will provide adequate assurance of material quality and public safety.

NRC Acceptance/SER Dated May 7, 1991

SER/TER Reference: 3.6.1.1

Relief granted as requested.