ATTACHMENT 3

AFFECTED PAGES FOR PROPOSED CHANGES TO APPENDIX A

TECHNICAL SPECIFICATIONS

QUAD CITIES STATION

UNIT 1

FACILITY OPERATING LICENSE DPR-29

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scl:1849:11

setting of 140% of rated steam flow, in conjunction with the flow limiters and main steamline valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel temperatures remain less than 1500°F, and release of radioactivity to the environs is well below 10 CFR 100 guidelines (reference SAR Sections 14.2.3.9 and 14.2.3.10).

Temperature monitoring instrumentation is provided in the main steamline tunnel to detect leaks in this area. Trips are provided on this instrumentation and when exceeded cause closure of Group 1 isolation valves. Its setting of 200°F is low enough to detect leaks of the order of 5 to 10 gpm; thus it is capable of covering the entire spectrum of breaks. For large breaks, it is a backup to high-steam flow instrumentation discussed above, and for small breaks with the resulting small release of radioactivity, gives isolation before the guidelines of 10 CFR 100 are exceeded.

High radiation monitors in the main steamline tunnel have been provided to detect gross fuel failure. This instrumentation causes closure of Group 1 valves, the only valves required to close for this accident. With the established setting of 15 times normal background (without hydrogen addition) and main steamline isolation valve closure, fission product release is limited so that 10 CFR 100 guidelines are not exceeded for this accident (reference SAR Section 14.2.1.7).

Pressure instrumentation is provided which trips when main steamline pressure drops below 825 psig. A trip of this instrumentation results in closure of Group 1 isolation valves. In the Refuel and Startup/Hot Standby modes this trip function is bypassed. This function is provided primarily to provide protection against a pressure regulator malfunction which would cause the control and/or bypass valve to open. With the trip set at 825 psig, inventory loss is limited so that fuel is not uncovered and peak cladding temperatures are much less than 1500°F; thus, there are no fission products available for release other than those in the reactor water (reference SAR Section 11.2.3).

The RCIC and the HPCI high flow and temperature instrumentation are provided to detect a break in their respective piping. Tripping of this instrumentation results in actuation of the RCIC or of HPCI isolation valves. Tripping logic for this function is the same as that for the main steamline isolation valves, thus all sensors are required to be operable or in a tripped condition to meet single-failure criteria. The trip settings of 170°F and 300% of design flow and valve closure time are such that core uncovery is prevented and fission product release is within limits.

INSERT "A"

INSERT "B"

INSERT "C"

Amendment No. 121

The instrumentation which initiates ECCS action is arranged in a one-out-of-two taken twice logic circuit. Unlike the reactor scram circuits, however, there is one trip system associated with each function rather than the two trip systems in the reactor protection system. The single-failure criteria are met by virtue of the fact that redundant core cooling functions are provided, e.g., sprays and automatic blowdown and high-pressure coolant injection. The specification requires that if a trip system becomes inoperable, the system which it activates is declared inoperable. For example, if the trip system for core spray A becomes inoperable, core spray A is declared inoperable and the out-of-service specifications of Specification 3.5 govern. This specification preserves the effectiveness of the system with respect to the single-failure criteria even during periods when maintenance or testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal so that MCPR does not go below the MCPR Fuel Cladding Integrity Safety Limit. The trip logic for this function is one out of n; e.g., any trip on one of the six APRM's, eight IRM's, four SRM's will result in a rod block. The minimum instrument channel requirements assure sufficient instrumentation to assure that the single-failure criteria are met. The minimum instrument channel requirements for the RBM may be reduced by one for a short period of time to allow for maintenance, testing, or calibration. This time period is only ~ 3% of the operating time in a month and does not significantly increase the risk of preventing an inadvertent control rod withdrawal.

The APRM rod block function is flow biased and prevents a significant reduction in MCPR, especially during operation at reduced flow. The APRM provides gross core protection, i.e., limits the gross withdrawal of control rods in the normal withdrawal sequence.

In the refuel and startup/hot standby modes, the APRM rod block function is set at 12% of rated power. This control rod block provides the same type of protection in the Refuel and Startup/Hot Standby modes as the APRM flow-biased rod block does in the Run mode, i.e., prevents control rod withdrawal before a scram is reached.

The RBM rod block function provides local protection of the core, i.e., the prevention of transition boiling in a local region of the core for a single rod withdrawal error from a limiting control rod pattern. The trip point is flow biased. The worst-case single control rod withdrawal error is analyzed for each reload to assure that, with the specific trip settings, rod withdrawal is blocked before the MCPR reaches the fuel cladding integrity safety limit.

TABLE 3.2-1

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION FUNCTIONS

Minimum Number of Operable or Tripped Instrument Channels [1]	Instruments	Trip Level Setting	Action[2]
4	Reactor low water[5]	>144 inches above top of active fuel*	A
4	Reactor low low water	≥84 inches above top of active fuel*	A
4	High drywell pressure[5]	≤2.5 psig [3]	A
16	High flow main steamline[5]	≤140% of rated steam flow	B
16	High temperature main steamline tunnel	≤200°F	B
4	High radiation main steamline tunnel[6]	≤15 x normal rated power background (without hydrogen addition)	B
4	Low main steam pressure[4]	≥825 psig	B
2	High flow RCIC steamline	≤300% of rated steam flow[7]	C
4	RCIC turbine area high temperature	≤170°F	C
2	High flow HPCI steamline	≤300% of rated steam flow[7]	D
4	HPCI area high temperature	≤170°F	D

Notes INSERT "D"

[1] Whenever primary containment integrity is required, there shall be two operable or tripped systems for each function, except for low pressure main steamline which only need be available in the Run position.

TABLE 3.7-1 (Cont'd)

PRIMARY CONTAINMENT ISOLATION

Isolation Group	Valve Identification	Valve Number for Units 1 and 2	Number of Power-Operated Valves Inboard	Outboard	Maximum Operating Time (sec)	Normal Operating Position	Action on Initiating Signal
	Reactor Water Cleanup						
3	Pump suction isolation valve	MO-1201-2	1		≤30	O	GC
3	Pump suction isolation valve	MO-1201-5		1	≤30	O	GC
	HPCI						
4	Steam isolation valve	MO-2301-4	1		≤50	O	GC
4	Steam isolation valve	MO-2301-5		1	≤50	O	GC
	RCIC						
5	Turbine steam supply	MO-1301-16	1		≤25	O	GC
5	Turbine steam supply	MO-1301-17		1	≤25	O	GC

INSERT "E"

Amendment No. 114

TABLE 3.7-1 (Cont'd)

Key:
O: open
C: closed
SC: stays closed
GC: goes closed

Note: Isolation groupings are as follows:

Group 1: The valves in Group 1 are closed upon any one of the following conditions:
1. Reactor low-low-water level
2. Main steamline high radiation
3. Main steamline high flow
4. Main steamline tunnel high temperature
5. Main steamline low pressure

Group 2: The actions in Group 2 are initiated by any one of the following conditions:

1. Reactor low water level
2. High drywell pressure

Group 3: Reactor low water level alone initiates the following:

1. Cleanup demineralizer system isolation

Group 4: Isolation valves in the high pressure coolant injection system (HPCI) are closed upon any one of the following signals.

The steam supply

1. HPCI steamline high flow
2. High temperature in the vicinity of the HPCI steamline
3. Low reactor pressure

Group 5: Same as Group 4 except applies to RCIC

INSERT "F"

Amendment No. 114

INSERT "A"

"A trip of this instrumentation results in closure of the RCIC or HPCI steam supply isolation valves. The trip logic for this function is similar to that for the main steamline isolation valves, thus all sensors are required to be operable or in a tripped condition to meet single-failure criteria."

INSERT "B"

"In addition, the steam supply valves for each system are closed on low steamline pressure to provide primary containment isolation when the reactor pressure, as sensed in the system steamlines, is below the required pressure for turbine operation."

INSERT "C"

"Operation of the HPCI turbine will continue as long as reactor pressure is above 150 psig. When the reactor pressure falls below 150 psig, the speed of the turbine-pump unit will decrease and gradually be slowed due to stop friction and windage losses at low reactor pressures. The low reactor pressure isolation setpoint was developed in accordance with NEDC-31336, "General Electric Instrument Setpoint Methodology," dated October, 1986. The trip setpoint of greater than or equal to 100 psig was calculated such that the isolation will occur on decreasing reactor pressure to provide primary containment isolation when the reactor pressure, as sensed in the system steamlines, is below the required pressure for turbine operation. The external vacuum breaker line for the HPCI turbine will isolate on low steamline pressure concurrent with high drywell pressure signals. The instrumentation and controls ensure the proper HPCI and primary containment response to a HPCI steamline break (isolation of the steamline supply valves only), a large break inside the containment (closure of the steam supply and vacuum relief isolation valves) and a small or intermediate size break inside containment (steam supply and vacuum breaker isolation valves remain open for HPCI operation)."

INSERT "D"

"4	HPCI Steamline pressure			≥100 psig			D"

INSERT "E"

"4	Vacuum breaker isolation	MO-2399-40	1		≤50	0	GC"
"4	Vacuum breaker isolation	MO-2399-41		1	≤50	0	GC"

INSERT "F"

"The turbine exhaust vacuum breaker isolation valves close when both of the following signals are present (simultaneously):

1. High drywell pressure
2. Low reactor pressure

Group 5: Isolation valves in the reactor core isolation cooling system (RCIC) are closed upon any one of the following signals:

1. RCIC steamline high flow
2. High temperature in the vicinity of the RCIC steamline
3. Low reactor pressure"

ATTACHMENT 4

EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION FOR

PROPOSED CHANGES TO APPENDIX A, TECHNICAL SPECIFICATIONS

QUAD CITIES STATION

UNIT 1

FACILITY OPERATING LICENSE DPR-2[illegible]

The proposed changes outlined in this amendment request would:

1. Reflect a proposed modification to the HPCI turbine steam exhaust line vacuum breaker configuration scheduled for the upcoming cycle 12 refueling outage. The modification will create a new primary containment boundary such that the steam exhaust line check valve 2301-45 can be removed from the 10 CFR 50, Appendix J leak rate testing program and incorporated into the Inservice Testing Program according to Section XI of the ASME Code per 10 CFR 50.55(g).

2. Amend the current Technical Specification to correct an omission of the HPCI low pressure isolation setpoint to Table 3.2-1.

3. Amend the current Technical Specification to add two new vacuum line primary containment isolation valves to Table 3.7-1.

Commonwealth Edison has reviewed the proposed amendment in accordance with the criteria delineated in 10 CFR 50.91, and has concluded that the proposed amendment does not present a significant hazards consideration. The basis for the determination is as follows:

BASIS FOR NO SIGNIFICANT HAZARDS CONSIDERATION

Commonwealth Edison has evaluated this proposed amendment and determined that it involves no significant hazards consideration. In accordance with the criteria of 10 CFR 50.92 (c) a proposed amendment to an operating license involves no significant hazards considerations if operation of the facility, in accordance with the proposed amendment, would not:

1. **Involve a significant increase in the probability or consequences of an accident previously evaluated because:**

Table 3.2-1

The addition of the HPCI steam line low pressure isolation setpoint to Technical Specification Table 3.2-1 is a correction of an omission to the original Technical Specification. The HPCI system primary containment isolation feature is part of the original design basis for the system; however, the isolation setpoint has not been included in the Technical Specification. The proposed change corrects this omission by adding the low pressure isolation setpoint and limiting conditions for operations to Technical Specification Table 3.2-1. The calculation which supports the proposed setpoint assures that HPCI is not prematurely isolated. The isolation setpoint does not affect any accident initiators; therefore, does not represent any increase to the probability of the accident.

The addition of the HPCI steam line low pressure isolation setpoint to Technical Specification Table 3.2-1 will ensure that steam and radioactive gases will not escape from the HPCI turbine shaft seals into the reactor building after steam pressure has decreased below turbine operating pressure. CECo has performed a calculation to confirm the value of the proposed low pressure isolation setpoint (100 psig). The calculation ensures that the isolation does not occur prior to the low pressure assumed in the fuel accident analysis of 150 psig. The lower bounding limit for isolation is based on engineering judgment and is conservative when compared to the anticipated stall pressures for the HPCI turbine. The HPCI low pressure isolation setpoint, therefore, does not increase the consequences of the accident but rather provides further assurances that the isolation function is initiated at an appropriate pressure.

Table 3.7-1

The elimination of the existing vacuum breaker line and the addition of a new vacuum breaker line does not affect any accident initiator and as such does not affect the probability of the accident. Currently, the vacuum breaker relief line, which is located inside the torus, creates a potential flow path from the containment air space through the existing vacuum breakers to the HPCI exhaust line. Containment atmosphere leakage is prevented by the existing turbine exhaust check valves which are periodically tested in accordance with 10 CFR 50, Appendix J.

The proposed modification changes the primary containment boundary. The modification does not affect any accident initiators and therefore does not affect the probability of an accident. The design features of the new vacuum breaker assures that the consequences of an accident are not increased. The new design isolates the torus air space from the HPCI steam exhaust line through the use of motor-operated valves. The new vacuum breaker valves are designed to accommodate 10 CFR 50, Appendix J leak rate testing and will be added to the Station's 10 CFR 50, Appendix J Test Program. As such, the valve leakage will be included in the limits for containment leakage, as defined in the Technical Specifications, to ensure that the resulting doses will not exceed 10 CFR, Part 100 limits.

The consequences of the accident are also unaffected by the closure time of the new motor-operated valves. The valve closure time is based on the ability of the valve to close and does not significantly affect the dose rates. The specified closure time is typical of current motor-operated isolation valves in the HPCI system and is less than the time where significant fuel failure occurs during a design basis loss-of-coolant accident.

Finally, the isolation logic assures that the HPCI system is isolated during conditions in which the HPCI reactor inventory or pressure control function cannot be maintained and there is indication of a large break in the drywell. This isolation logic assures that the consequences of the accident are not significantly increased by providing the necessary isolation of containment during accident conditions.

2. **Create the possibility of a new or different kind of accident from any previously evaluated because:**

Table 3.2-1

As indicated previously, the HPCI low reactor pressure isolation function was included as part of the original system design; however, a limiting condition for operation and instrumentation setpoint was not included in Technical Specification Table 3.2-1. As such, the proposed amendment does not introduce the use of new equipment which has a different failure mechanism or whose failure is considerably more probable that the existing equipment. The proposed change to Table 3.2-1, therefore, does not create the possibility of a new or different kind of accident from any previously evaluated.

Table 3.7-1

The proposed modification to the HPCI system improves the reliability of the isolation system. The proposed design utilizes smaller isolation valves (when compared to the turbine exhaust check valve) and a more effective isolation boundary design (motor-operated gate valve versus check valve). The HPCI isolation sensors and control logic are optimally arranged to provide a high degree of reliability. Independence is provide to each isolation valve so that no single failure will prevent the isolation function. Periodic testing of instruments and valves ensures

that the isolation function of the valves is maintained within design parameters. Manual operation of the valves (both local and remote) is a backup in the unlikely event of a failure to automatically isolate.

The control logic for the new isolation valves provides reliable operation for HPCI performance. The new valves will be normally open during operation. Therefore, the valves are not required to stroke from their normal position in the case of a HPCI initiation. The valves will automatically isolate on indications of a large break inside containment (drywell pressure greater than 2.5 psig) and when HPCI is no longer capable of providing pressure control and/or reactor water inventory.

A gross failure of the vacuum breaker function and/or new containment isolation valves in the closed position has been evaluated for the potential hazard of collapsing the turbine exhaust line and containment penetration due to a vacuum. Using conservative parameters for the HPCI exhaust piping (length-to-diameter = 50 and diameter-to-thickness = 40) and the methods of ASME Section III NB-3133.3 (cylindrical shells made of low yield carbon steel), the capability of the exhaust piping exceeds a maximum external pressure of 300 psia. Since the maximum theoretical external pressure is less than 15 psia, the collapse of any HPCI turbine exhaust component is not a concern.

Finally, the proposed design for the new vacuum breaker is consistent with the design of newer BWR plants for external vacuum breaker lines (e.g., LaSalle RCIC).

3. **Involve a significant reduction in the margin of safety because:**

Table 3.2-1

As previously indicated, the original design for the system included the HPCI low reactor pressure isolation function. The existing setpoint for the HPCI isolation is 90 psig which is based on previous operability requirements for HPCI. The new calculated setpoint (100 psig) does not involve a significant reduction in the margin of safety since the calculation inputs; (1) assure that the HPCI function will remain Operable during periods when the HPCI system is required to support the assumptions in the accident analysis; and, (2) assure that the isolation of the HPCI system will occur prior to reaching the stall pressure for the turbine. The lower bound for the calculation is conservative when compared to the anticipated stall steam pressures typical of turbines similar to the Quad Cities design. The margin of safety remains essentially unchanged in that the isolation setpoint has not significantly changed from the current value used to isolate the turbine prior to steam pressure reaching a level where the turbine can no longer operate.

Table 3.7-1

The proposed design for the new vacuum breaker does not involve a significant reduction in the margin of safety. Technical Specifications specify the acceptance criteria for containment integrity determination and also require that the containment undergo testing as specified in 10 CFR 50, Appendix J. Due to the modification of the containment boundary

with the new vacuum breaker line, the motor-operated valves will be tested in accordance with 10 CFR 50, Appendix J to ensure TS leakage limits are maintained. The testing will ensure that any potential leakage will result in dose limits well below 10 CFR, Part 100 limits. In addition, the existing containment boundary for the HPCI steam exhaust system utilizes the suppression pool inventory (as an effective water seal) and two large check valves. One of the check valves is testable and will continue to be tested according to Section XI of the ASME Code per 10 CFR 50.55(g), to ensure that the HPCI turbine exhaust line does not experience water leaks.

The closure time for the HPCI vacuum breaker isolation valves does not significantly decrease the margin of safety. The closure times are based on reasonable closure times for the motor-operated valves. The specified closure time is typical of current motor-operated isolation valves in the HPCI system and is less than the time where significant fuel failure occurs during a design basis loss-of-coolant accident.

Finally, the isolation logic is designed to assure that HPCI remains in a "standby" operational mode and isolates during conditions which are indicative of a large break in the drywell concurrent with an insufficient steam pressure to support the HPCI system function.

Therefore, since the proposed license amendment satisfies the criteria specified in 10 CFR 50.92, Commonwealth Edison has determined that a no significant hazards consideration exists for these items. We further request their approval in accordance with the provisions of 10 CFR 50.91(a)(4)

scl:1849:16

ATTACHMENT 5

ENVIRONMENTAL ASSESSMENT FOR PROPOSED CHANGES TO APPENDIX A

TECHNICAL SPECIFICATIONS

QUAD CITIES STATION

UNIT 1

FACILITY OPERATING LICENSE DPR-29

The proposed changes to the Quad Cities Nuclear Power Station Technical Specifications involve:

1. A proposed modification to the HPCI turbine steam exhaust line vacuum breaker configuration scheduled for the upcoming cycle 12 refueling outage. The proposed modification will create a new primary containment boundary such that the steam exhaust line check valve 2301-45 can be removed from the 10 CFR 50, Appendix J leak rate testing program and incorporated into the Inservice Testing Program according to Section XI of the ASME Code per 10 CFR 50.55(g). The new primary containment will consist of two motor-operated 4-inch gate valves as discussed in Attachment 1 of this amendment request.

2. The addition of the HPCI low pressure isolation setpoint to Table 3.2-1.

3. The addition of two new vacuum line primary containment isolation valves to Table 3.7-1. The new isolation valves will establish a new boundary for the HPCI steam exhaust line and are required to be tested in accordance with 10 CFR 50, Appendix J requirements. The testing will ensure that the containment leakage remains within TS limits and as such, will ensure any resulting dose will remain within 10 CFR, Part 100 limits. The isolation logic for the new valves will ensure that the potential leakage path is isolated under conditions indicative of a large break loss-of-coolant accident where HPCI operation is inhibited due to reactor low pressure.

scl:1849:17

Commonwealth Edison has evaluated the proposed amendment in accordance with the requirements of 10 CFR 50.21, and has determined that the amendment meets the requirements for categorical exclusion as specified by 10 CFR 51.22 (c)(9).

Commonwealth Edison has evaluated the proposed changes against the criteria of 10 CFR 50.92 (c) and determined that the proposed changes do not present a significant hazards consideration. The basis for that determination is provided in Attachment 4.

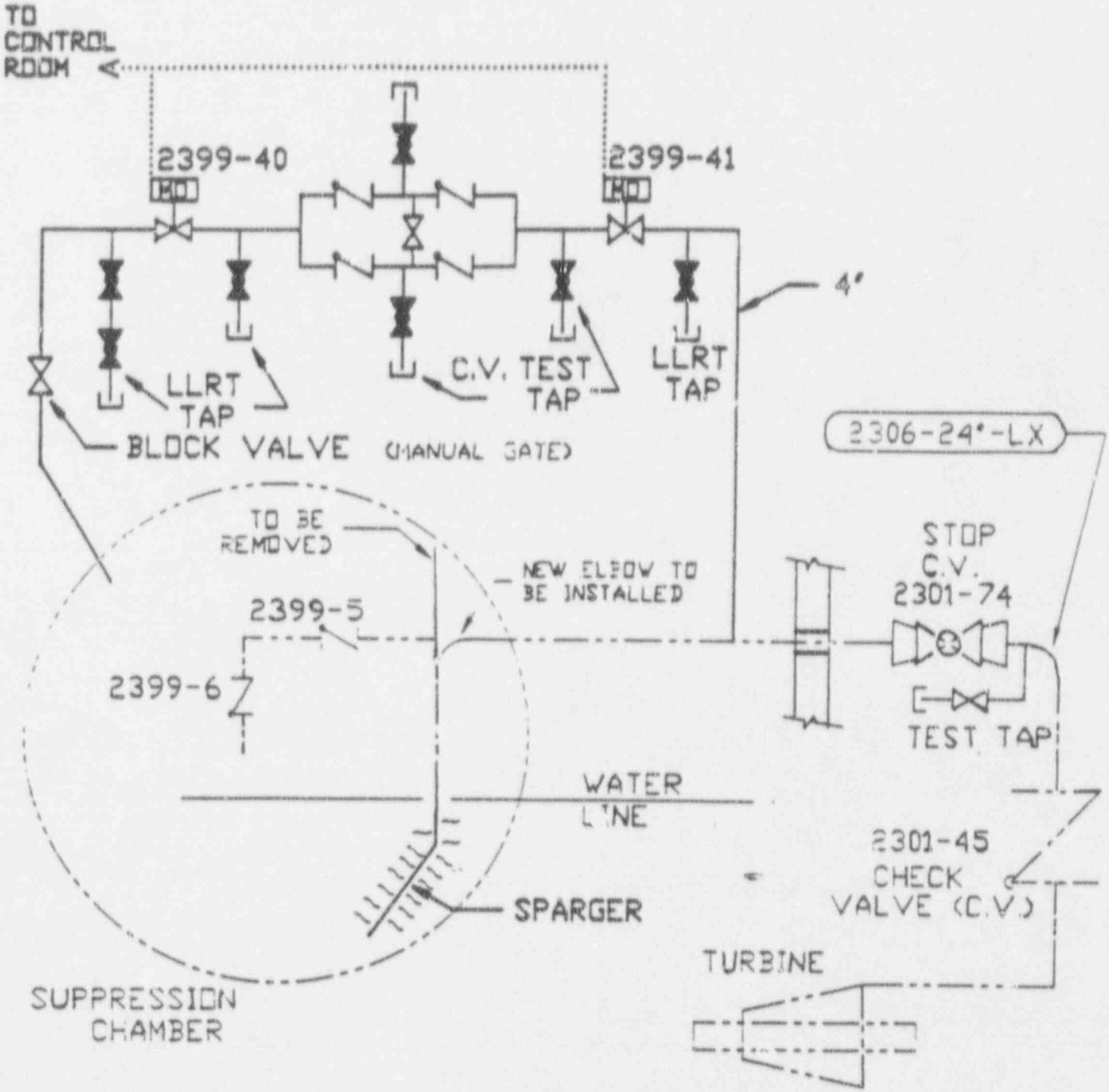
The proposed amendment does not change the types of effluents or increase the amounts of effluents that may be released offsite. The proposed changes have no significant affect on individual and cumulative occupational radiation exposure nor are any significant increases likely to occur due to the proposed amendment. Commonwealth Edison is currently testing the HPCI steam exhaust check valve on an accelerated schedule due to poor performance. As a result, occupational radiation exposure associated with this valve is higher than normally expected for the maintenance of a containment isolation valve. The installation and maintenance of the new vacuum breaker isolation valves is not expected to result in any significant increase in occupational exposures.

In conclusion, the proposed Technical Specification amendment will not result in any increase in environmental consequences and does not involve irreversible consequences beyond those already accepted by the NRC in the Final Environmental Statement.

scl:1849:18

Figure 1

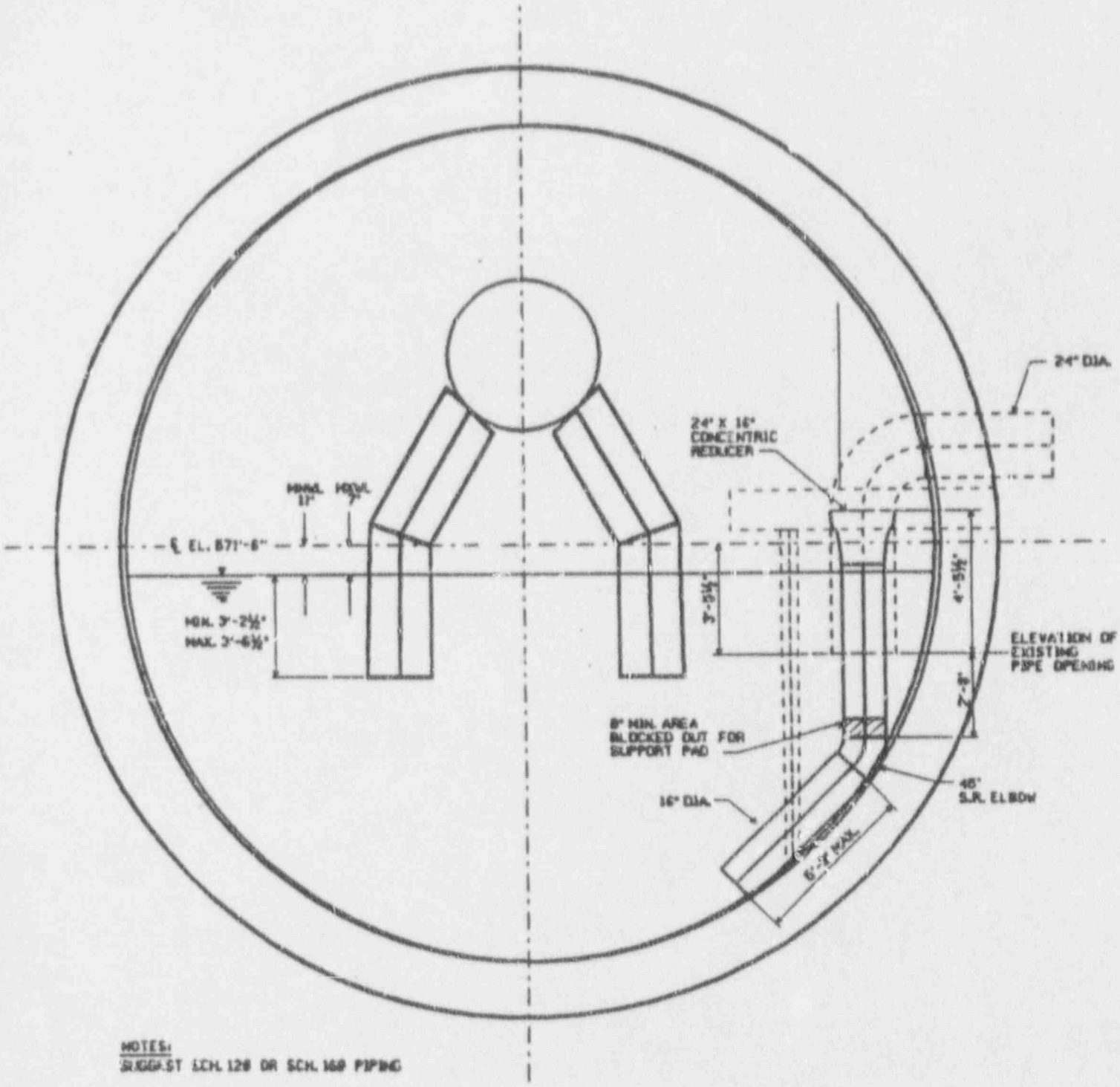
HPCI TURBINE EXHAUST LINE MODIFICATION



NOTES:

1. PHANTOM LINES DEPICT EXISTING PIPING
2. NEW VACUUM BREAKER LINE VALVE NUMBERS ARE FOR REFERENCE ONLY

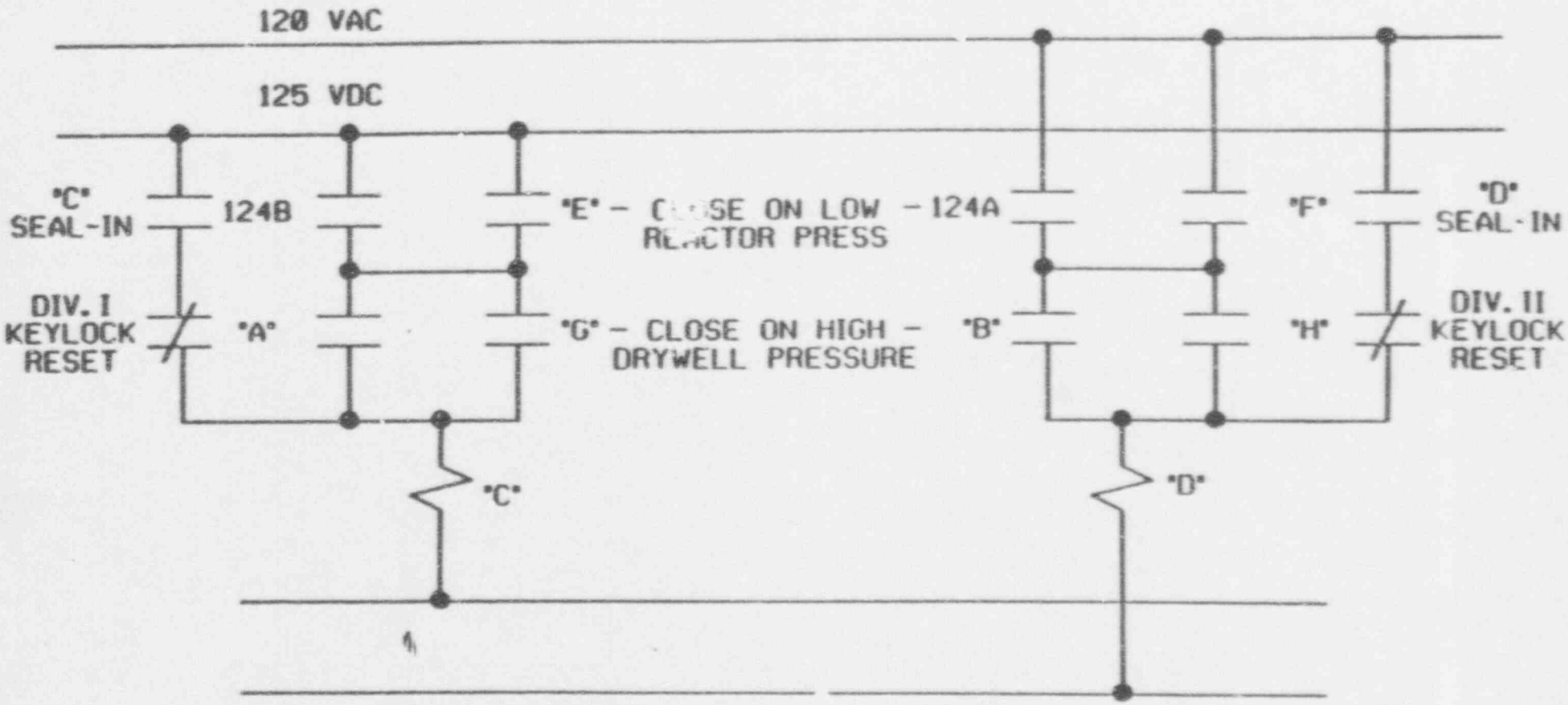
Figure 2



HPCI SPARGER CONCEPTUAL DESIGN

Figure 3
(Page 1 of 3)

HPCI GROUP 4 ISOLATION LOGIC (2399-40,41 VACUUM BREAKERS)



SIMPLIFIED CONTROL SCHEMATIC
2399-40

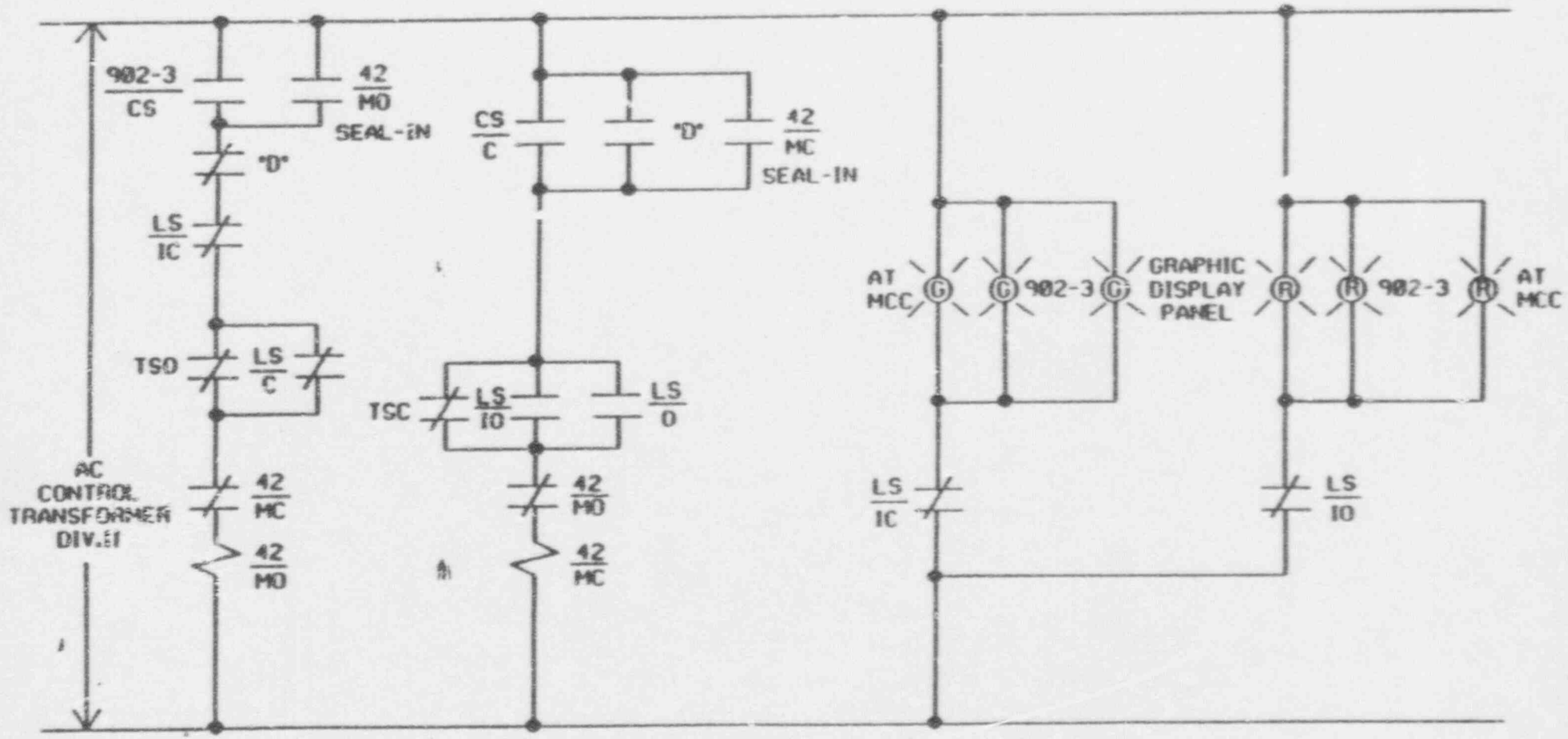


Figure 3
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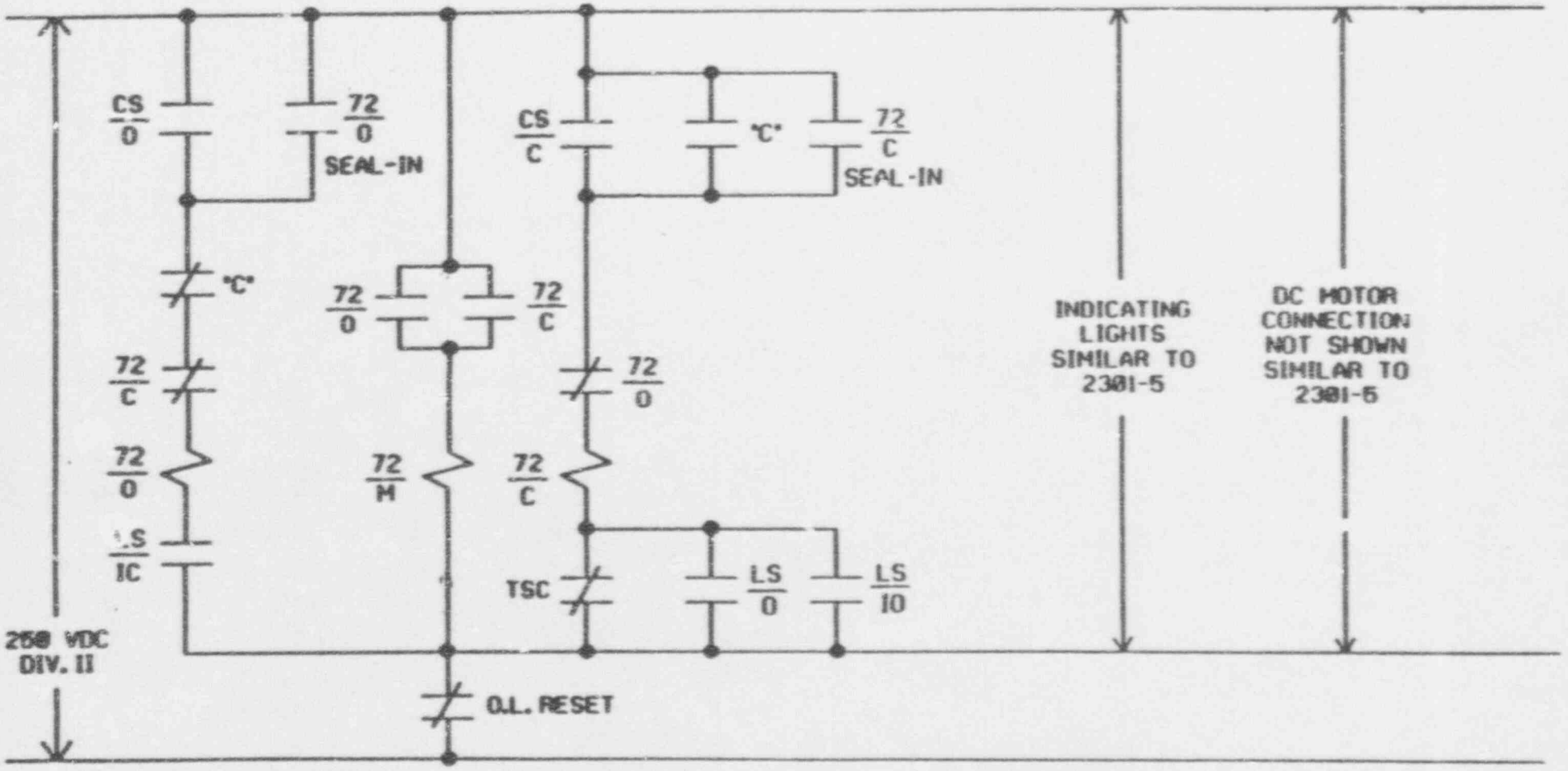
SIMPLIFIED CONTROL SCHEMATIC
2399-41



GENERAL ELECTRIC COMPANY

AFFIDAVIT

I, David J. Robare, being duly sworn, depose and state as follows:

1. I am Manager, Plant Licensing Services, General Electric Company, and have been delegated the function of reviewing the information described in paragraph 2 which is sought to be withheld and have been authorized to apply for its withholding.

2. The information sought to be withheld is contained in the GE proprietary report, "Quad Cities HPCI Turbine Steam Supply Pressure Low Setpoint Calculation, GE-NE-901-013-0491, Rev. 1," June 6, 1991. This report presents a calculation to determine the setpoint for the Quad Cities HPCI turbine steam supply pressure low channel. The calculation was performed consistent with the GE proprietary document, "General Electric Instrument Setpoint Methodology, NEDC-31336," dated October 1986.

> "A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business and which gives him an opportunity to obtain an advantage over competitors who do not know or use it...A substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring information...Some factors to be considered in determining whether given information is one's trade secret are (1) the extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and to his competitors; (5) the amount of effort or money expanded by him developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others."

3. Some examples of categories of information which fit into the definition of Proprietary Information are:

   a. Information that discloses a process, method or apparatus where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

   b. Information consisting of supporting data and analyses, including test data, relative to a process, method or apparatus, the application of which provide a competitive economic advantage, e.g., by optimization or improved marketability;

   c. Information which if used by a competitor, would reduce his expenditures of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality or licensing of a similar product;

GENERAL ELECTRIC COMPANY

d. Information which reveals cost or price information, production capacities, budget levels or commercial strategies of General Electric, its customers or suppliers;

e. Information which reveals aspects of past, present or future General Electric customer-funded development plans and programs of potential commercial value to General Electr.

f. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection;

g. Information which General Electric must treat as proprietary according to agreements with other parties.

4. Initial approval of proprietary treatment of a document is typically made by the Subsection Manager of the originating component, the person who is most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within the Company is limited on a "need to know" basis and such documents are clearly identified as proprietary.

5. The procedure for approval of external release of such a document typically requires review by the Subsection Manager, Project Manager, Principal Scientist or other equivalent authority, by the Subsection Manager of the cognizant Marketing function (or delegate) and by the Legal Operation for technical content, competitively effect and determination of the accuracy of the proprietary designation in accordance with the standards enumerated above. Disclosures outside General Electric are generally limited to regulatory bodies, customers and potential customers and their agents, suppliers and licensees then only with appropriate protection by applicable regulatory provisions or proprietary agreements.

6. The document mentioned in paragraph 2 above has been evaluated in accordance with the above criteria and procedures and has been found to contain information which is proprietary and which is customarily held in confidence by General Electric.

7. The information to the best of my knowledge and belief has consistently been held in confidence by the General Electric Company, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties have been made pursuant to regulatory provisions of proprietary agreements which provide for maintenance of the information in confidence.

8. Public disclosure of the information sought to be withheld is likely to cause substantial harm to the competitive position of the General Electric Company and deprive or reduce the availability of profit making opportunities because it would provide other parties, including competitors, with valuable information.

Enclosure 2

GENERAL ELECTRIC COMPANY

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

David J. Robare, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are truly and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 12TH day of JUNE 1991.

David J. Robare
General Electric Company

Subscribed and sworn before me this 12th day of June 1991.

OFFICIAL SEAL
PAULA F. HUSSEY
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires APR 5, 1994

Paula F. Hussey
Notary Public, State of California

Enclosure 3

BWR SERVICES information letter

October 31, 1973

SIL No. 30
Category 2

HPCI/RCIC TURBINE EXHAUST LINE VACUUM BREAKERS

Surveillance testing of the HPCI/RCIC systems at many operating BWRs has disclosed an undesirable exhaust line vacuum condition that causes one or more of the following adverse effects:

1. Pressure instability in the exhaust line.
2. Cycling and slamming of the exhaust line check valves.
3. Pipe and torus vibration.
4. Water slug carryover.
5. Post shutdown vibration caused by steam collapse.

Investigations into this phenomenon during the course of pre-op activities at Browns Ferry 1 and Peach Bottom 2 have concluded that HPCI/RCIC systems can benefit significantly by the installation of vacuum breakers on the turbine exhaust lines. Tests conducted at Browns Ferry and Peach Bottom confirmed that the installation of vacuum breakers improves low load operation and provides acceptable turbine shutdown conditions by minimizing pressure fluctuations. Also, the installation of these vacuum breakers will prevent water from rising in the turbine exhaust line during a postulated LOCA when the torus would become pressurized.

The minimum vacuum breaker size recommended is 2 inches for HPCI turbine exhaust, and 1½ inches for RCIC turbine exhaust. The vacuum breaker check valves should have a pressure drop of less than 0.5 psi to assure adequate vacuum breaker capability.

Figures 1 & 2 (attached) provide schematics of the recommended installation. Note that Figure 1 applies to plants having HPCI systems whereas Figure 2 is applicable to HPCI/RCIC systems.

Note also that both vacuum breaker configurations include provisions for positive isolation of the suppression pool air space. This provision is in compliance with AEC criteria that check valves not be used for long term isolation. The positive isolation should be automatically initiated by a combination of low reactor pressure and high drywell pressure. The existing low reactor pressure switches may be used, combined with existing "2 psig" high drywell pressure switches. Electrical separation should be maintained to the redundant isolation switches.

Remote manual switches in the control room are not required; local switches are considered adequate. However, control room indicating lights should be provided, plus an alarm annunciating "VACUUM BREAKER ISOLATION VALVES NOT FULLY OPEN."

If additional help in implementing this recommended installation is desired, General Electric would be pleased to provide a quotation for supplemental engineering or installation assistance.

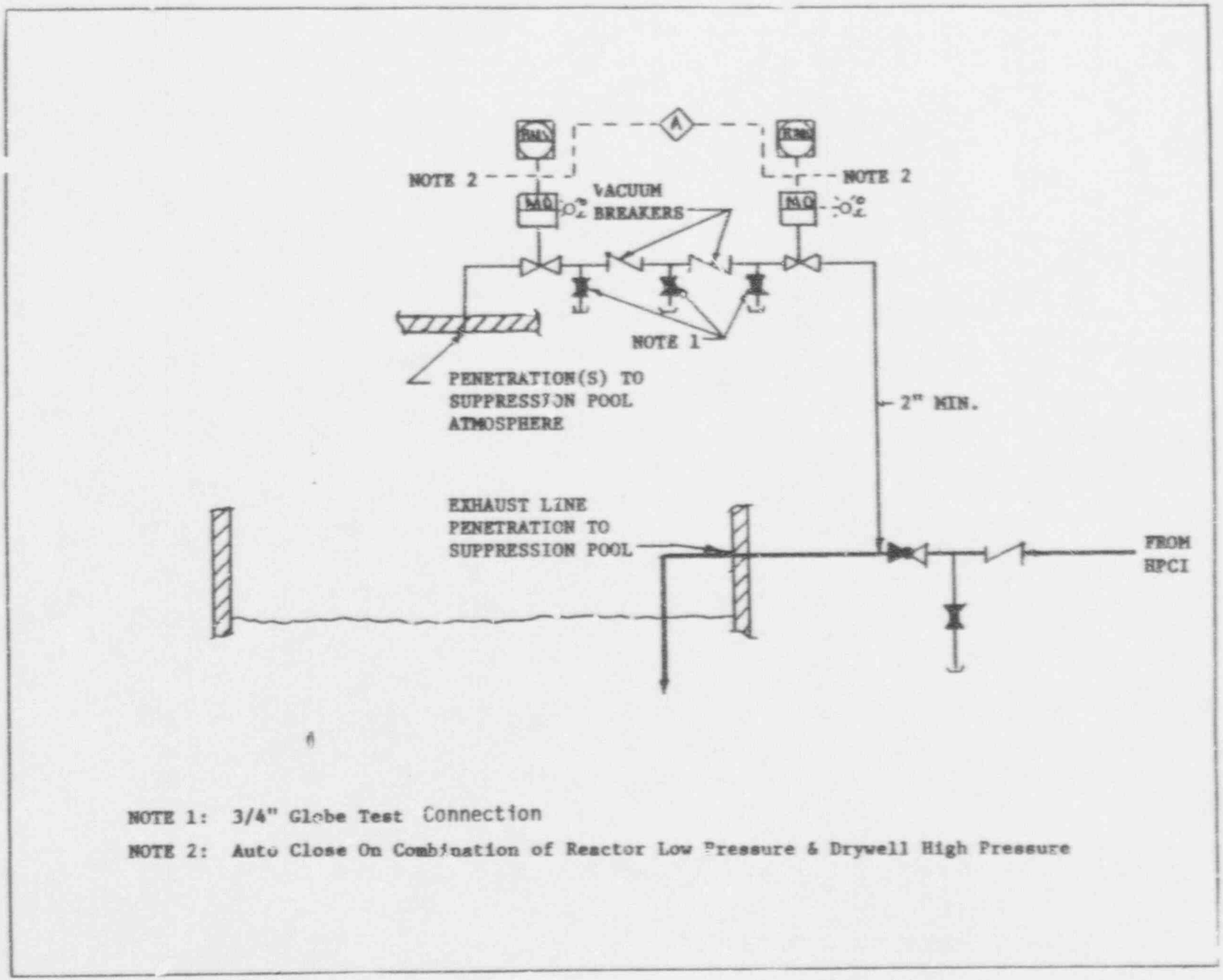
Prepared by: V. G. Grayhek

Approved by: D. G. Bridenbaugh, Manager
Performance Evaluation and
Improvement

Issued by: V. G. Grayhek, Manager
Performance Analysis and
Service Communications

Product Reference:

E41 - HPCI System
E51 - RCIC System



NOTE 1: 3/4" Globe Test Connection

NOTE 2: Auto Close On Combination of Reactor Low Pressure & Drywell High Pressure

FIGURE 1

Enclosure 3
SIL No. 30
ATTACHMENT

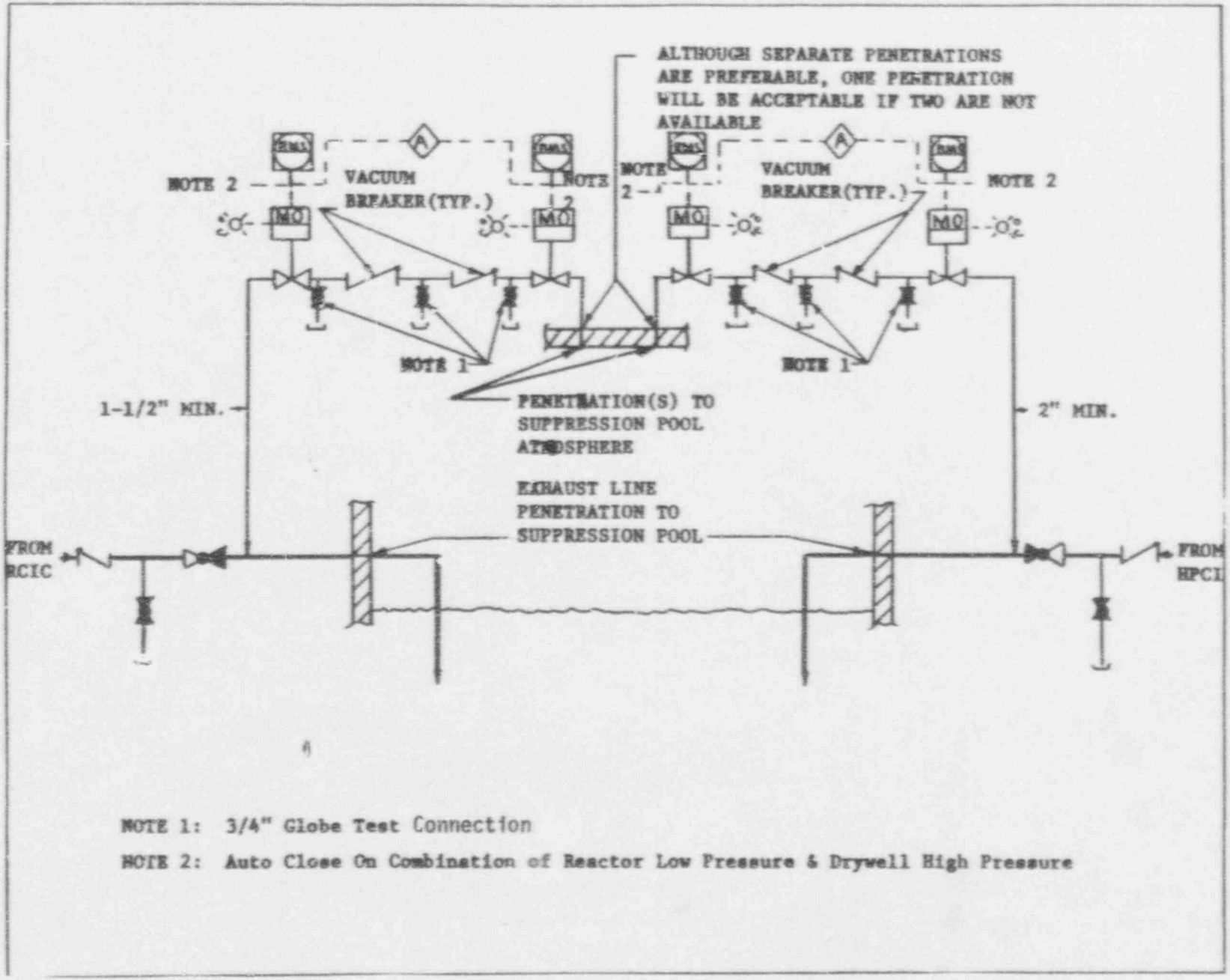


FIGURE 2

Enclosure 3
SIL No. 30
ATTACHMENT