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

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Containment Isolation Valves with a Safety Function to Open

Gentlemen:

By letter dated October 29, 1996 Waterford 3 made a commitment to review the original design and acceptance of containment penetrations and associated containment isolation valves in certain Essential Systems. The architect engineer, Raytheon was contacted to assist in performing this review. Raytheon personnel did recall that extensive detailed reviews and evaluations were performed by both the licensee and the NRC. In 1981 a detailed review of FSAR Table 6.2.32 (Containment Isolation Valve Table) was reviewed by the Containment Systems Branch (CSB) of NRR. After resolving questions of a formal and informal nature, the CSB documented its results in Sections 6.2.4 and 22.2 of the Waterford 3 SER (NUREG 0787). The issue was again revisited by the CSB in 1983 and 1984 during the issuance of the Operating License and Waterford 3 Technical Specifications.

The purpose of this letter is three fold - 1) to identify and describe containment penetrations that include remote manual containment isolation valves that were determined by Waterford 3 not to have a closed safety function (this was an NRC concern raised in the recent Special Inspection) 2) to provide information on system functions and licensing basis that led to these determinations and 3) request that the NRC review and evaluate this information and provide Waterford 3 with a Safety Evaluation Report documenting the results of your review.

Waterford 3 continues to believe that the technical specifications for Containment Isolation (TS 3.6.3) that requires containment isolation valves to be operable has been complied with. The TS assures two barriers in series to be operable such that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analysis. The rules of Subsection IWV of ASME B&PV, Section XI for valve exercising present the requirements for isolation valve operability testing. Each penetration description provided herein will identify the safety function of the subject valves as determined by the accident analysis.

The FSAR (subsections 3.1.47 and 6.2.4) states that valves isolating penetrating lines serving engineered safety feature systems (ESFS) are not closed automatically by the CIAS, but have the ability to be closed by remote manual operation from the main control room, thereby isolating any engineered safety feature system which malfunctions. This statement is true when actuating power is available and the system actuation signal is cleared. The automatic valves in penetrations serving Containment Spray and Component Cooling Water to the Containment Fan Coolers were not designed with an override capability to close while the applicable safety system signal is actuated. No documented evidence exists that elaborates on this design. However, Waterford 3 continues to believe this design is acceptable and that this design was reviewed and accepted by the NRC.

The Waterford 3 SER (section 6.2.4 page 6-15) states that "Lines which must remain in service following an accident for safety reasons are provided with at least one remote manual valve. All air-operated isolation valves assume the position of greater safety upon a loss of air or control power."

At the present time all of the subject valves have been provided with remote manual capability by ensuring an available source of motive power post-accident and providing administrative controls to plant operators to jumper the circuit to allow for an override function.

The FSAR also provides the justification for not leak testing the valves discussed herein. Corrective action concerning the Containment Vacuum Relief lines (previously discussed with the NRC) evaluated the systems listed in the FSAR that credit a closed system to in support of an exemption to 10 CFR Part 50 Appendix J Type C leak testing.

The systems discussed herein were described as closed systems in the FSAR. Several of these systems are aligned to the Reactor Water Storage Pool (RWSP) that is vented to atmosphere and located outside the Controlled Ventilation Area Boundary. Therefore, a passive closed system as defined in ANSI N271-1976 paragraph 3.6.7 does not exist during normal operations in that the RWSP communicates with the atmosphere. However, during accident conditions a closed system is present. These systems contain multiple barriers that prevent the communication of containment atmosphere with outside atmosphere/RWSP. This issue is discussed herein and a change to the FSAR is currently in process to appropriately revised it. Waterford 3 considers that the basis for the NRC exemption to Type C leak testing is not impacted.

Waterford 3 has concluded that the long-standing issue concerning the Containment Spray System isolation capability would be best resolved by submitting a license amendment request that would justify eliminating CS 125 A&B from the license and design basis as containment isolation valves. Therefore, a license amendment request has been prepared and will be submitted concurrent with this letter.

Should you have any questions concerning the above, contact me at (504) 739-6242 or Tim Gaudet at (504) 739-6666.

Very truly yours,

James J. Fisicaro

J.J. Fisicaro
Director
Nuclear Safety

JJF/PLC/ssf
Attachment
Enclosures

cc: L.J. Callan, NRC Region IV
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Background

There are several systems identified at Waterford 3 that include containment isolation valves (CIVs) that have a designated post-accident safety function to open. These systems are labeled as Essential systems since they perform a safety related accident mitigation function. The CIVs in these penetrations are placed there to meet applicable General Design Criteria (GDC) 54 through GDC 57. These valves are located in systems that are expected to be water filled post-accident and are not leak-tested pursuant to 10 CFR 50 Appendix J. The outside CIVs in these penetrations have been identified as not having a safety function to close. Evaluations of these penetrations have been conducted by Waterford 3 engineering staff and the NRC to determine if the appropriate design requirements and testing requirements were met. The following discussion is an attempt to describe the specific details associated with each identified system and penetration, discuss the licensing basis history and attempt to clarify confusion associated with these penetrations and their associated CIVs.

The scope of this discussion will be limited to the following penetrations:
Containment Spray (CS), High Pressure Safety Injection (HPSI) & Low Pressure Safety Injection (LPSI), Component Cooling Water (CCW) to the Containment Fan Coolers (CFCs), Chemical and Volume Control System (CVCS) Charging System

All of the above listed systems contain CIVs whose post-accident safety function is to open. The dual function to close has been considered a non-safety function. However, all valves included in containment penetrations pursuant to GDC 55 through GDC 57 have always been subject to the requirements of TS 3.6.3. Even if the valve was not capable of opening or closing, the specified actions requirements of TS 3.6.3 would have been complied with. Testing requirements for the subject valves were determined pursuant to TS 4.0.5 and ASME Code requirements.

The FSAR describes the design criteria for containment penetrations by designating the penetrations into Classes. The penetrations discussed in this submittal are either Class C, that covers GDC 57, or Class D, that covers GDC 55 & GDC 56 as follows:

<u>Class C</u>

Penetrations in this class are for lines which are neither connected to the reactor coolant pressure boundary nor connected directly to the containment atmosphere but connected to a closed seismic Category I system inside containment. Each line shall be provided with at least one containment isolation valve outside the containment which shall be either automatic or locked closed, or capable of remote manual operation.

Class D

Penetrations in this class are for lines with a pressure barrier which are either connected to the reactor coolant pressure boundary or connected directly to the containment atmosphere. A pressure barrier is said to exist when the line is part of a closed system outside the containment which is designed for pressure equal to or greater than containment design pressure. Each line is provided with at least one containment isolation valve outside the containment which shall be either automatic or locked closed or capable of remote manual operation.

A simple check valve is not used as the automatic isolation valve outside the containment. An automatic valve or a locked closed valve may be used as the isolation valve outside the containment.

Discussion

As discussed below, a gross passive failure in the Engineered Safety Feature Systems with a LOCA is not considered credible due to the design qualification requirements that have been imposed on these lines. Leakage due to passive failure in these lines will be limited to leakage from failed valve packing or mechanical seal rather than the complete severance of the line. This is consistent with ANSI N658 Single Failure Criteria for PWR Fluid Systems, Section 3.6. Leakage of this nature is precluded by testing and inspection at periodic intervals.

CS (Penetrations 34 and 35)

The CS provides borated water spray for post-accident heat removal, pressure reduction and iodine removal from the containment atmosphere. A simplified diagram of the CS system is provided in the attached Figure 1. The system is actuated when the Safety Injection Actuation Signal (SIAS) and the High-High Containment Pressure signal are in coincidence. This generates a Containment Spray Actuation Signal (CSAS) which starts the spray pumps and opens the containment spray header isolation valves CS-125 (A&B). The pumps initially draw a suction from the Refueling Water Storage Pool (RWSP) and deliver borated water to the spray nozzles located at the top of containment. This is called the injection mode. Another mode of operation called the recirculation mode, is automatically initiated by the Recirculation Actuation Signal (RAS) after a low-low level is reached in the RWSP. During this mode of operation, the suction for the spray pumps is taken from the Safety Injection System Sump at the bottom of containment. During normal plant operation, CS system piping is maintained full of water to reduce the CS response time after actuation. This response time requires a fast acting valve to meet the accident analysis assumptions. The CS system contains 10 inch check

valves CS-128 (A&B) located inside containment which perform the system containment isolation function. The outside containment isolation valves (CS-125 A&B) are pneumatically operated gate valves which are designed to open upon initiation of a Containment Spray Actuation Signal (CSAS). These valves are also designed to fail open and can not be closed while a CSAS is present nor do they receive an automatic closure signal. Containment spray piping penetrates the reactor containment and connects directly to the containment atmosphere. As such these penetrations are subject to GDC 56. Valves CS-129 (A&B) are 1/2 inch solenoid operated globe valves located inside containment in parallel with CS-128 (A&B) and are opened only when riser water level indication is required.

The CS isolation valves (CS-125 and CS-128) are not Type C leak tested pursuant to 10 CFR Appendix J. CS-125 (A&B) were initially supplied with air accumulators by the valve vendor. The design specification specified that enough air should be available to provide for two full strokes within one hour after the accident. Subsequent to Generic Letter 88-14 concerning Instrument Air, the CS-125 valve air accumulators were tested to ensure that at least ten hours of air was available post-accident. This was considered necessary to facilitate entry into shutdown cooling following a small break LOCA or provide containment isolation if the CS system failed to start. The accumulator would support operator action post LOCA until the up stream stop check valve, CS-117 (A&B), was accessible or ten hours, which ever was longer.

In 1992 Waterford 3 evaluated this accumulator test and determined that the CS-125 valves do not have a post-accident safety function to close. Access to the CS-117 valves would be acceptable within six hours post-LOCA. The inside and outside check valves would close and maintain a water seal, thus providing an acceptable barrier. Accumulator testing was discontinued prior to RF 07 in 1995. The safety function of CS-125 indicated the following:

During accident conditions, CS-125 opens upon receipt of a CSAS. This air-operated valve is required to have remote manual closure capability from the control room in the event that containment spray malfunctions and requires containment isolation. Two containment isolation valves in series are not required for this line since, should an event occur requiring containment isolation, but not requiring containment spray, then CS-128A and CS-129A would provide a containment isolation barrier and the CS system piping water seal would provide a second barrier. Prior to CSAS the CS system piping water seal would provide a second barrier since the static head of the RWSP would overcome 17.7 psia. Above 17.7 psia, the CS pump will start and the CS pump discharge pressure will overcome containment pressure. Should the pump fail to start as a single active failure, CS-128A and CS-129A can be assumed to function to provide the containment barrier.

In 1993 the NRC staff approved a temporary TS change to maintain CS-125 in the open position. The associated SER for this change acknowledges that CS-125 (A&B) are remote manual valves that cannot be closed when a CSAS is in effect and that the design configuration and classification is consistent with the SRP containment penetration isolation criteria. The staff also indicated that should an event occur (while CS-125 is open) requiring containment isolation but not requiring containment spray, then check valves CS 128 (A&B) would provide one isolation barrier and the CS system piping water seal would provide a second barrier.

Based on the above Waterford 3 believed that all necessary regulatory requirements (design and testing) were being met and the methodology used in determining post-accident safety functions was in effect. This supports similar determinations associated with other penetrations on the grounds of "if it is acceptable for this penetration then it should be acceptable for these other similar penetrations."

Current Evaluation

These penetrations are identified as Class C penetrations. The valves' remote manual capability in the past is being questioned because of the inability to close while the CSAS in effect and the lack of air accumulator testing. The IST basis document indicates that these valves have a safety function to open. The safety function was determined by applying the assumptions of the accident analysis and the system functions. IWV of the ASME Code Section XI is used to determine operability testing. A closed safety function is not identified. However, should the valve become inoperable for any reason entry into TS 3.6.3 would be applicable.

Waterford 3 performs leak testing on the following valves SI-107, SI-120, SI-121, SI-417, CS-118. This testing assures that a pressure boundary exists outside containment. The leak tight integrity of the system is assured by periodic inspections, thus assuring that a water seal will be available.

Waterford's current evaluation of these penetrations indicates that justification exists to no longer designate CS-125 A&B as CIVs in the design and licensing basis. This would eliminate any questions concerning the valves' safety position and provide for a level of protection commensurate with the system's predominate safety function. The basis for a proposed license amendment would credit the pressure barrier outside containment as closed redundant isolation barrier.

Analysis of the containment penetration barriers for Containment Spray System penetrations (34, 35) indicates that a loop seal is present except for a small period of time under worst case conditions. This short period is dependent upon the time required to switch from taking pump suction from the RWSP to the Safety Injection Sump. Once the suction is switched to the sump after a RAS, a loop seal is maintained at the level of the sump due to the same pressure being applied to both the suction and discharge piping. To lose the seal prior to RAS containment pressure must be greater than the elevation head of the RWSP. The minimum containment pressure required to overcome the RWSP head when it's at low level is approximately 29 psia. Since the peak containment pressure for any accident is approx. ..ately 59 psia, the maximum allowable leak rate through the existing mechanical barriers (i.e., check valves) can be determined based on the time required to reach RAS.

Assuming TS maximum level in the RWSP and only one CS pump operating, the maximum time required to reach RAS is less than 5 hours. After RAS is reached, a loop seal is maintained at the Safety Injection Sump elevation.

The CS system meets all requirements of ANS-271-1976/ ANS -56.2 for a closed system outside containment except that this system takes suction from the RWSP that is located outside the CVAS boundary and vented to atmosphere . However, the system design and additional testing assures that the system can be maintained water filled post-accident, assuming any single active failure. Therefore, containment atmosphere will not communicate with the RWSP. As previously stated, Waterford 3 performs leak testing on the following valves SI-107, SI-120, SI-121, SI-417, CS-118. Stop check valve CS-117 would be added to this list.

The acceptance criteria for valve leak rate testing can be established to ensure no containment atmospheric leakage back to the RWSP. The identified mechanical barriers would serve two safety related functions 1) to maintain a water seal in the line preventing containment atmosphere from escaping and 2) preventing back leakage of contaminated water to the RWSP. The mechanical barriers are located within the CVAS boundary. CS-117 and CS-118 would be identified as containment isolation valves. GDC 56 does not allow the use of a simple check valve (CS-117) as the outside automatic isolation valve. However, these valves would not be credited as providing isolation of containment atmosphere but rather maintaining a water barrier. Waterford 3 believes that this is an acceptable alternative isolation per the provision of GDC 56 "other defined basis" as described above. The system design and additional testing, assuming any single active failure, assures that the system can be maintained water filled post-accident. Therefore, a closed system outside containment can be credited as the containment isolation barrier and CS-125 no longer will be designated as CIVs.

This system is subject to inspection that periodically verifies leakage is within acceptable limits. Leakage limits are also specified for bypass leakage to the RWSP.

CCW to the CFCs (Penetrations 15, 16 17, 18, 19, 20, 21 and 22)

These penetrations (see attached simplified Figure 2) are GDC 57 penetrations that credit the closed system inside containment as one isolation barrier and an outside isolation valve as the redundant barrier. The outside isolation valves are air operated butterfly valves that open for normal, post-accident, and failure positions. These valves are equipped with air accumulators. With an SIAS in effect the capability to override the signal and close the outside isolation valves was not included in the original design.

In FSAR Question 022.9 the NRC staff stated the following:

> "It is our position that all isolation valves to satisfy General Design Criteria 54 through 57(containment isolation valves) should be pneumatically (Type C) leak tested. Alternatively, a isolation valve may be exempted from the Type C test requirements if it can be shown that the valve does not constitute a potential containment atmosphere leak path following a loss-of-coolant accident.
>
> Table 6.2-43 identifies that containment isolation valves that will not be Type C tested. Therefore, justify that they do not constitute potential containment atmosphere leak paths following a LOCA. In this regard, a water seal may be shown to exist that will preclude containment atmosphere leakage. If this approach is taken, discuss how a water seal can be established and maintained using safety grade pipes and components, and considering single failure of active components. System drawings showing the routing and elevation of piping may be used to show the existence of a water seal.
>
> Waterford 3 Response -The Component Cooling Water Supply and return to the Containment Fan Cooler Units form a closed seismic Category I system inside of containment. Isolation valves in these penetrations will not be exposed to the containment atmosphere during a loss of coolant accident."

A rupture of the line inside containment concurrent with a LOCA was not considered credible due to the design of the line inside containment. Since no single active failure would expose the inside piping to containment atmosphere, the function of the outside valve to close was considered a non-safety function. In addition, the design of the system did not include an override feature that would allow closure while the system actuation signal was in effect. These elements lead to the conclusion that designating a non-safety closure function was appropriate.

Current Evaluation

These penetrations are designated as Class C penetrations. The IST basis document indicates that these valves have a safety function to open. Closure of these valves is not required to shut down the plant or mitigate an accident therefore, these valves do not have a safety function to close. However, should the valve become inoperable, entry into TS 3.6.3 would be applicable.

Waterford 3 believes that the intent of TS 3.6.3 is to assure two barriers in series to be operable such that no single credible failure or malfunction of an active component can result in a loss of isolation or leakage that exceeds limits assumed in the safety analysis. The breach of the line inside containment concurrent with a LOCA is not considered credible. The outside CIVs in these penetrations are considered as dual function valves with a safety function to open and a non-safety function to close. Administrative controls have been provided to plant operators to facilitate overriding the system and enabling valve closure while the SIAS is in place. The ability to override along with air accumulator testing, ensures that the remote manual closure capability is provided per GDC 57. Waterford 3 is currently considering a design change to install an override feature that will allow closure when a SIAS is present.

SAFETY INJECTION SYSTEM (HPSI and LPSI)
(Penetrations 36, 55, 37, 56, 38, 57 39, 58, 53, 65, 69 and 70)

Piping in these penetrations connect directly to the RCS. These penetrations are Classified as Class D penetrations. The SI System is comprised of 3 High Pressure Safety Injection (HPSI) pumps and 2 Low Pressure Safety Injection (LPSI) pumps. The HPSI and LPSI pumps are arranged in two redundant trains each capable of supplying water to the Reactor Coolant System (RCS). The third HPSI pump is an installed spare which may be aligned to either train.

SI headers penetrate the containment through normally closed, motor-operated CIVs. Upon receipt of a Safety Injection Actuation Signal (SIAS), these valves open to a preset position to allow flow to the RCS. The SI pumps also receive a start from the SIAS. These valves are provided with override capability to allow operators to close the valves if desired. Containment isolation capabilities are provided inside containment by check valves in the SI headers. There are actually two check valves in series inside containment, between the RCS pressure boundary and the containment. These are pressure isolation valves (PIVs) that are leak tested to ensure protection against inner-system LOCA (see attached ECCS Figure 3).

Current Evaluation

These penetrations meet the requirements of GDC 55. The IST program indicates that these valves have a safety function to open. A safety function to close is not identified. However, should the valve become inoperable entry into TS 3.6.3 would be applicable.

The associated systems meet all requirements of ANS-271-1976 for a closed system outside containment except that these systems take suction from the RWSP that is located outside the CVAS boundary. The system design, assuming any single active failure, assures that the system can be maintained water filled post-accident, therefore, containment atmosphere will not communicate with the RWSP.

CVCS Charging (Penetration 27)

The outside CIV in the Charging line (of the CVCS) exemplifies a containment isolation valve that does not have a safety function to close. This is the system that the NRC focused on during the recent Inservice Testing Inspection (NRC Inspection Report, 50-382/96-09) to evaluate safety functions of components in order to ascertain the appropriate testing was being performed. The NRC performed an over view of the systems discussed herein and picked the Charging line to review in-depth. The intent was that if this system was acceptable then the other systems and applications of a similar nature should be acceptable. As previously stated this approach was used by Waterford 3 in conducting evaluations on these systems and component functions and may not be an effective means of identifying all aspects associated with containment isolation as it relates to design criteria, system function and component testing.

The Charging portion of the CVCS is used to inject borated water into the Reactor Coolant System (RCS) and is also labeled as an Essential system credited in mitigating the effects of the small break loss of coolant accident (SB-LOCA) described in Chapter 15 of the FSAR. The Charging line may be aligned to take suction from the Boric Acid Makeup Tank (BAMT) and the Volume Control Tank (VCT) or the RWSP depending on the mode of operation. The Charging line branch connections inside containment (see attached Figure. 4) are equipped with remote manual solenoid operated globe CIVs. The solenoid operated valves in that portion of the system that connects to the Pressurizer Auxiliary Spray are designed to fail closed and are normally in the locked closed position. The post-accident position may be open or closed. The solenoid operated valves in that portion of the system inside containment that connects to the RCS loops, are designed to fail closed and are normally maintained in the open position. The post-accident position is open. Check valves (that are not identified as CIVs) are located downstream of all of the Charging system solenoid valves inside containment. The outside CIV in the Charging line is an air operated gate valve. This valve is not equipped with air accumulators. The valve is designed to fail open and its normal position is locked open. The post-accident position is open. Additional barriers included in the Charging line up stream of the outside CIV are, a normally open manual valve, a pump discharge check valve, a positive displacement pump, another check valve and a motor operated valve.

Pre licensing FSAR Question 480.043 dated 6/81 stated the following:

Concerning containment isolation of the chemical and volume control charging line (Penetration No. 27).

A. Provide the justification for locking open the outside isolation valve (CVC-209). Describe how the valve will be locked open and how quickly it can be isolated if leakage is detected from this line outside containment.

B. Specifically describe the provisions for detecting possible leakage from this line outside containment.

C. Provide the justification that failing open is the "safe" position for the outside isolation valve (CVC-209).

Response

A. Charging isolation valve (CVC-209) is locked open to ensure the availability of boric acid to Reactor Coolant System at all plant operation modes. To close the valve the operator must obtain a key and insert it in the key switch in the control room. It is estimated that less than ten minutes is required to close the charging valves from the control room.

B. Leakage past this valve from the RCS is not expected while the charging system is in operation since the charging pumps are positive displacement thereby providing a higher pressure in the charging lines than in the RCS. Additionally, there will be no leakage past these valves post-LOCA if the charging lines are isolated since the charging system discharges into the RCS cold leg which is filled by the safety injection system thereby ensuring that the charging lines, from the RCS up to this valve is maintained with a water seal. This line will, therefore, not be exposed to the post- LOCA containment atmosphere.

C. One charging pump is used during normal plant operation. The other two charging pumps are automatically started by pressurizer level control or by the SIAS. The fail-open position of valve CVC-209 assures that a flow path for makeup and boron injection remain after a CIAS or an SIAS. Operation of the charging system is taken credit for in the small break LOCA analysis. The fail-open position of this valve therefore assures availability of the charging system after the small break LOCA event. If the safe position of this valve is closed, and this valve fails to the open position, then the fail-closed isolation valves inside containment will maintain containment isolation.

The following information on the charging line was provided to the NRC in a letter dated March 16, 1984 that discussed why this penetration should not be leak tested pursuant to 10 CFR Appendix J:

> "The charging system receives an automatic SIAS signal to start two charging pumps, align the system to take a suction on the Boric Acid Makeup Tanks and inject borated water into the Reactor Coolant System. Flow through this penetration is guaranteed in this line under post-LOCA conditions, and credit is taken for flow in the small break LOCA analysis. Technical Specification 4.1.2.2.b verifies the flow path at least every 31 days.
>
> During the subsequent post-LOCA period, the water in the Boric Acid Makeup Tanks may be depleted. When this happens, charging will be secured and the charging isolation valves will be shut. For most RCS break locations, the charging line will not be exposed to the containment atmosphere, since flow from the Safety Injection system keeps the piping covered with fluid. In the event the break was in the RCS Cold Leg at a position which caused the charging line to be exposed to the containment atmosphere, there are still several barriers available. Inside containment there are 2 valves in series in each charging path and outside containment there are check valves on each charging pump discharge in addition to the containment isolation valve. The charging pumps are positive displacement pumps further minimizing any back flow in the system. All of the piping is of high pressure design, and the valves are subject to ASME section XI testing.

A conservative calculation was performed assuming seat leakage of the outboard isolation valve, neglecting the resistance of the other valves and the positive displacement pumps. The outside isolation valve is a gate valve, thus only seat leakage has the potential to become stem leakage. The result shows that a water barrier can be maintained on the isolation valve for greater than 30 days even if one and one-half times the valve's design leakage is assumed. This calculation and the design leakage specification are based on system design pressure which is much higher than the relatively low Containment Post-Accident Pressure.

LP&L finds it highly unlikely that a credible leakage path from the Containment atmosphere to the outside atmosphere exists in this penetration."

Current Evaluation

These penetrations are required to meet the requirements of GDC 55. The rules of Subsection IWV of ASME B&PV, Section XI for valve exercising present the requirements for isolation valve operability testing. Pursuant to this criteria CVC-209 is considered a passive open valve not subject to active testing. Thus, the closure function of CVC-209 was considered a non-safety function. This non-safety function was fulfilled by the non-safety instrument air system and powered from a non-Class 1E power source. The inside CIVs are identified as having an active open and closed safety function. The closed safety function for the inside valves was not for containment isolation but rather to reduce RCS pressure if required.

One charging pump is used during normal operation to maintain pressurizer level, control boron concentration, and maintain the chemistry and purity of the RCS. The other two charging pumps are given an automatic signal based on pressurizer level control system or an SIAS. On a SIAS, the charging pumps' suction is aligned to the BAM tanks to provide emergency boration into the RCS. Once BAM tank inventory is depleted, the charging pumps are manually aligned to the RWSP if a RAS has not occurred. Once the RWSP is depleted, the charging pumps are secured and long term cooling is provided by the safety injection system. Once charging is secured post-accident, operators manually close CVC-218A(B) and CVC-209 and verify that CVC-216A(B) are closed to isolate containment. Position indication is available to verify containment isolation.

This evaluation identified problems with the license basis information previously discussed. Waterford 3 challenged the water barrier calculations that were provided with the license letter dated March 16, 1984. The concerns are:

- CVC-209 is a fail-open air operated gate valve. The non-safety instrument air system and/or the non-safety electrical power may not be available to close CVC-209 post-accident. The water barrier calculation credits CVC-209 as being closed to assure a 30 day water seal would exist.
- The majority of the charging system is located outside the CVAS boundary. A water seal is the basis for not performing Type C testing on this penetration. The assurance of a water filled Charging system post-accident is now in question.

Waterford 3's current evaluation of this penetration has resulted in the issuance of administrative controls to assure a water filled system will be maintained post-accident. In addition, plant operators have been provided with instructions to close CVC-208 if CVC-209 does not close when charging is secured post-accident. Design engineering is currently evaluating a design change to resolve these issues.

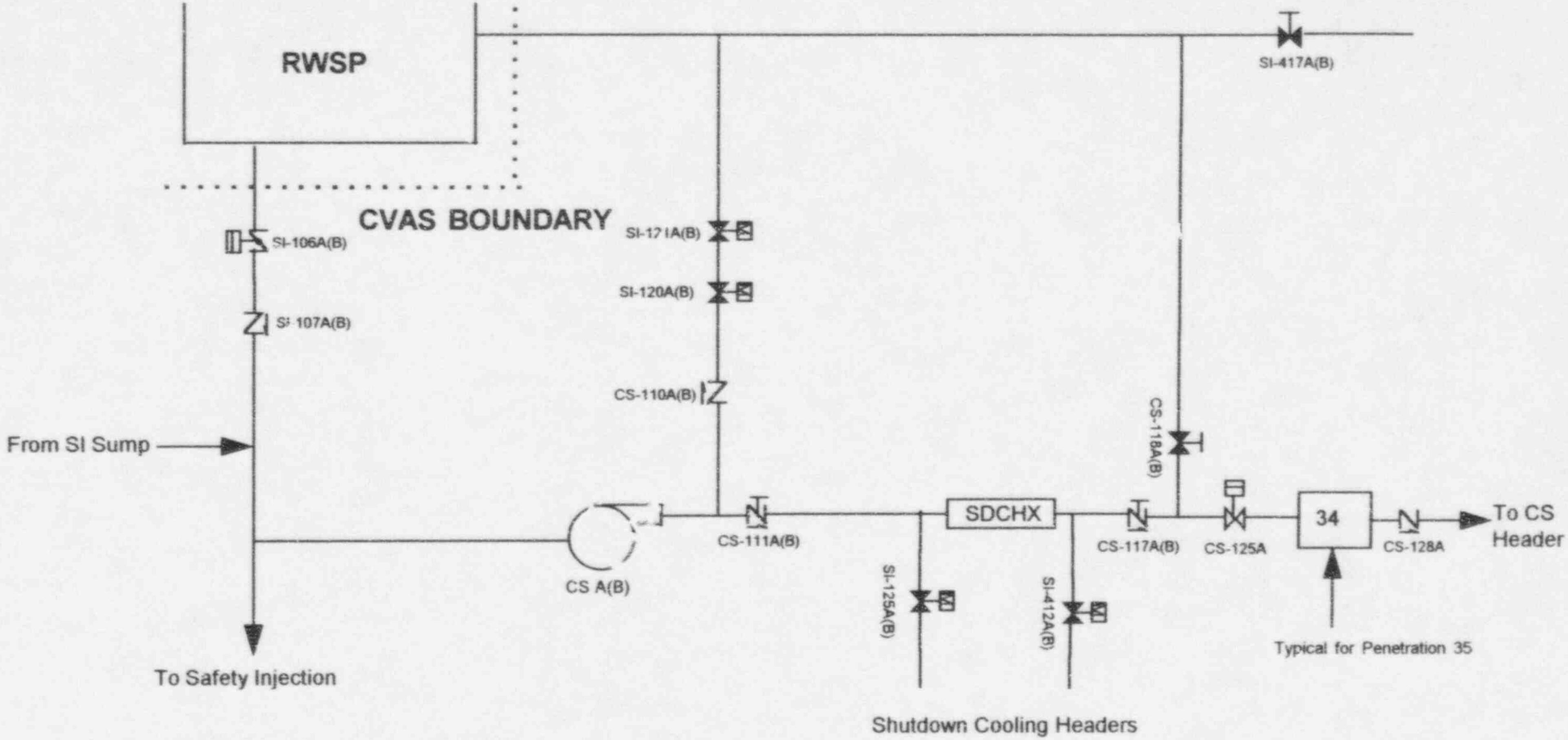
Conclusion

Waterford 3 has provided the position that the subject penetrations were originally designed to meet the requirements of the applicable GDC. This understanding was developed through various documented communications with the NRC. However, this position has recently been called into question with regard to verbatim compliance for remote manual capability. In this light, Waterford 3 has taken actions for the CS and CCW to CFC penetrations and is pursuing actions for the CVCS penetration to ensure remote manual capability post-accident.

With regard to TS 3.6.3 and testing per ASME Section XI, Waterford 3 considers that the requirements have been met in the past and are currently being met. Waterford 3 maintains the position that the outside isolation valves for the subject penetrations do not have a closed safety function to close. The evaluations conducted pursuant to Generic Letter 88-14 determined that these safety related pieces of equipment would function as intended upon loss of instrument air. Waterford 3 believes that the SRP indicates that remote manual valves may end up open post-accident. However, redundant barriers will serve to facilitate containment isolation. The current evaluation appear to be consistent with the original licensing bases and the intent of TS in assuring that an acceptable containment isolation barrier is available following a single active failure.

Subsequent to NRC review Waterford 3 intends to describe the design basis associated with the subject penetrations in explicit detail.

CONTAINMENT SPRAY SYSTEM - PENETRATIONS 34 and 35
(CSAS/RAS Alignment Shown)

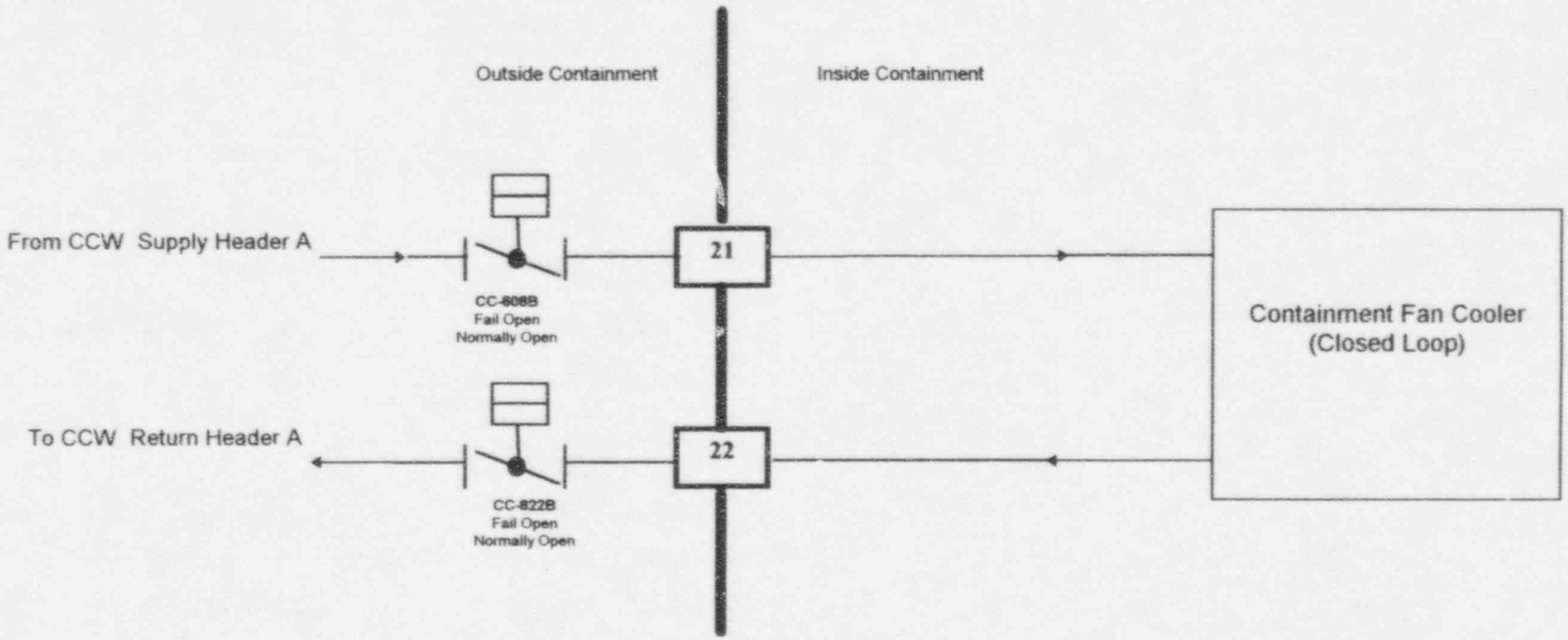


Notes:

1) Prior to a RAS, communication with the containment atmosphere will not occur by ensuring the system is water filled downstream of CS-117A(B) assuming a single failure of a Containment Spray Pump.
2) After a RAS, communication with the containment atmosphere will not occur since a loop seal will exist between the Safety Injection Sump and the Containment Spray header ensuring the system is water filled.

FIGURE 1

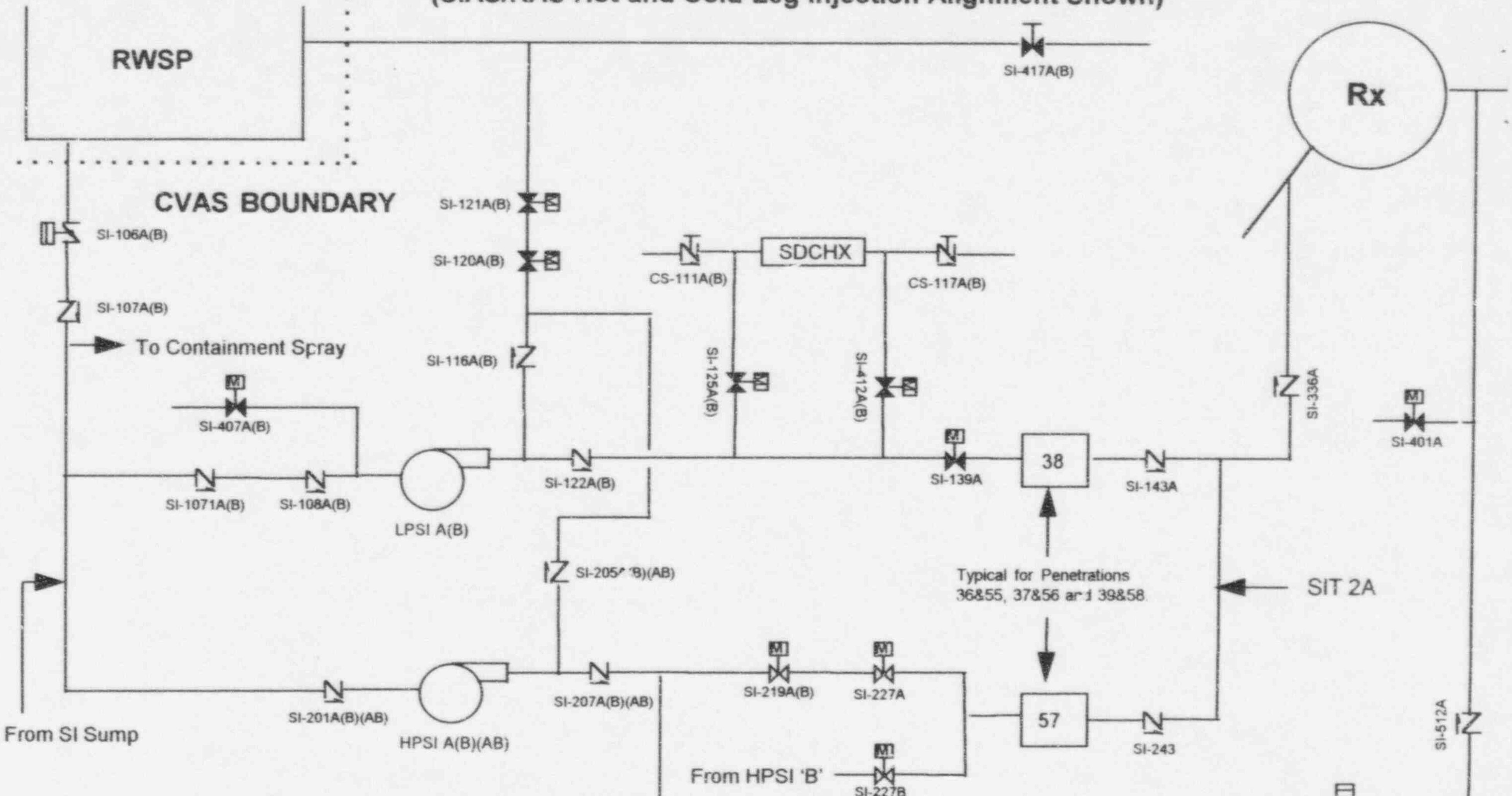
CCW TO CFC TYPICAL PENETRATION



	PENETRATION	ISOLATION
CFC A	20	CC-808A
	19	CC-822A
CFC B	15	CC-807B
	16	CC-823B
CFC C	18	CC-807A
	17	CC-823A
CFC C	21	CC-808B
CFC	22	CC-822B

FIGURE 2

HIGH PRESSURE and LOW PRESSURE SAFETY INJECTION SYSTEMS PENETRATIONS 36-39, 55-58, 69 and 70 (SIAS/RAS Hot and Cold Leg Injection Alignment Shown)



Notes:

1) For the Cold Leg Penetrations, SI flow will always maintain the system water filled assuming a failure of a SI Pump, therefore communication with containment atmosphere will not occur.
2) For the Hot Leg Penetrations, communication with the containment atmosphere will not occur, assuming a single failure of a HPSI Pump, by ensuring the system is water filled downstream of SI-510A(B). After a RAS, a loop seal will exist between the Safety Injection Sump and the Hot Leg Injection Header ensuring the system is water filled.

FIGURE 3

CHEMICAL and VOLUME CONTROL - CHARGING SYSTEM
PENETRATION 27
(SIAS/No RAS Alignment Shown)

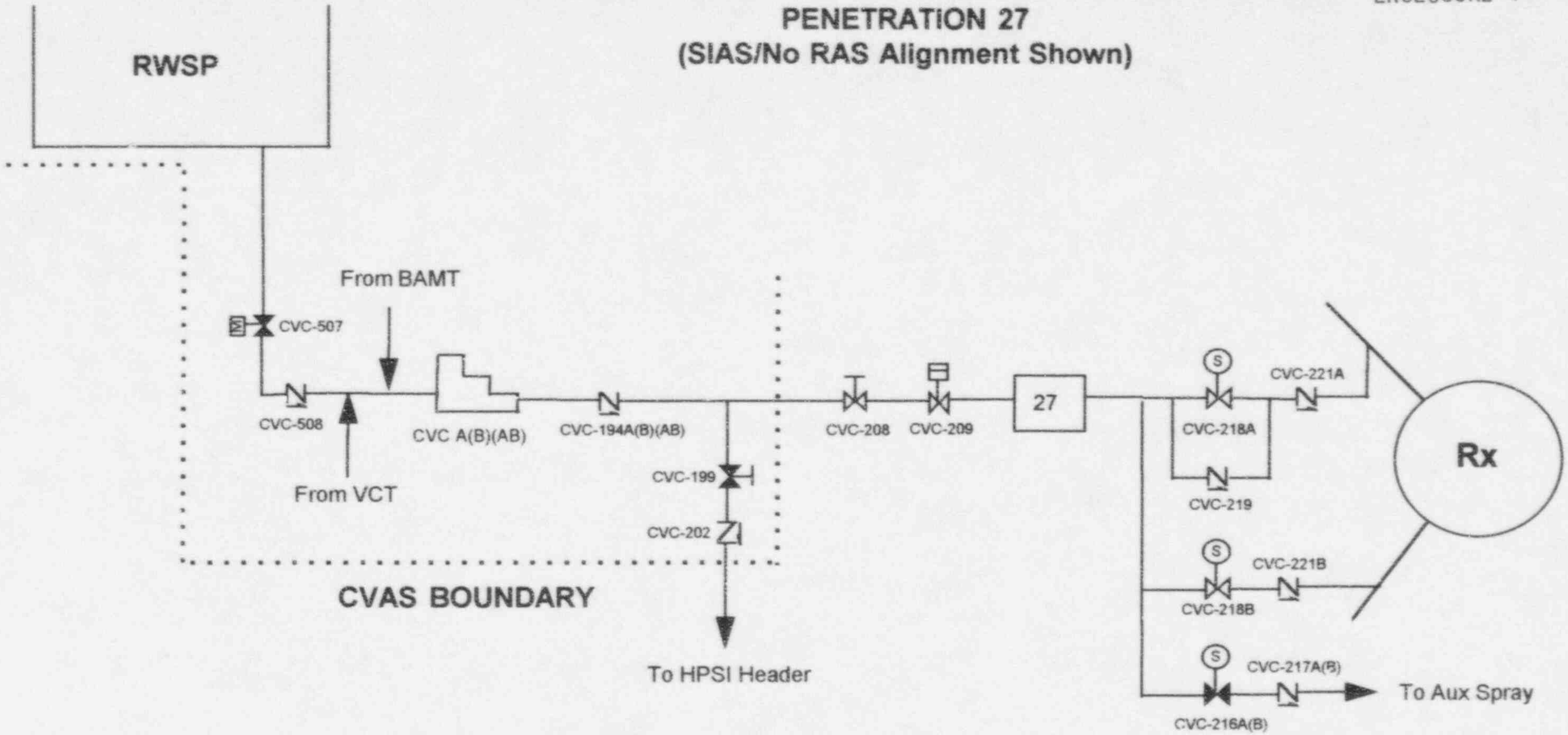


FIGURE 4