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the southern electric system

C. K. McCoy
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Docket Nos. 50-424
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LCV-0897A

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Vogtle Electric Generating Plant
120-Day Response to Generic Letter 96-06

Ladies and Gentlemen:

On September 30, 1996, the Nuclear Regulatory Commission (NRC) issued Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions". The GL requires a 30 day initial response and requests a written summary report within 120 days.

Georgia Power Company (GPC) provided a 30 day response in letter LCV-0897, dated October 24, 1996.

The 120 day response requires a written summary report stating the following information:

1) Actions taken in response to the requested actions.

2) Conclusions that were reached relative to susceptibility for water hammer and two-phase flow in the containment air cooling water system.

3) Conclusions that were reached relative to overpressurization of piping that penetrates containment.

4) The basis for continued operability of affected systems and components as applicable.

5) Corrective actions that were implemented or are planned to be implemented.

6) If systems were found to be susceptible to the conditions that are discussed in GL 96-06, identify the systems affected and describe the specific circumstances involved.

GPC has determined that the containment air coolers are susceptible to water hammer during the conditions outlined in the generic letter. Additionally, GPC has determined that the containment air coolers are not susceptible to two phase flow conditions during postulated accident conditions. Containment penetrations have also been reviewed for susceptibility to thermally-induced overpressurization and several were found to be susceptible to this concern. The water hammer transient and the containment penetrations that are potentially susceptible to thermally-induced overpressurization have been sufficiently reviewed and an adequate near-term basis for acceptability established. GPC has enclosed a written summary report detailing the applicability of this generic letter, the basis for continued operability of associated systems, and a summary of corrective actions implemented and planned.

Should you require any additional information regarding this response, please contact my office.

Sincerely,

C.K. McC

C. K. McCoy

Sworn to and subscribed before me this 27th day of January, 1997.

Mary N. Bentley
Notary Public

My Commission Expires: May 6, 1999

CKM/mtb

Enclosures:

I. Waterhammer in Containment Coolers and Two-Phase Flow in Safety Related Piping and Components
II. Overpressurization of Isolated Piping

xc: Georgia Power Company
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U. S. Nuclear Regulatory Commission
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Enclosure I

Water Hammer in Containment Coolers
and
Two-Phase Flow in Safety Related Piping and Components

Actions taken in response to the requested actions noted in GL 96-06

Requested Action from GL 96-06

1) "Determine if containment air cooler cooling water systems are susceptible to either water hammer or two phase flow conditions during postulated accident conditions."

GPC Response

Background

The Vogtle Containment Cooling Units are supplied with Nuclear Service Cooling Water (NSCW) as a cooling media. In order to address concerns about possible water hammer in the NSCW system inside Containment, transient analyses have been performed that include the effects of the containment temperature following Main Steam Line Break (MSLB) or Loss of Coolant Accident (LOCA) coincident with a Loss of Offsite Power (LOSP).

The Vogtle NSCW System consists of two independent trains which supply cooling water to the Containment Cooling Units (i.e., Containment Air Coolers, Auxiliary Containment Air Coolers, and the Reactor Cavity Coolers) and various other coolers and heat exchangers outside the containment building (see Sketch 1). Each NSCW train consists of a mechanical draft cooling tower and three pumps located approximately at elevation 220 feet which may supply flow to a common 24 inch piping header that serves the various loads in the system. From each pump's discharge piping, there is a motor operated isolation valve followed by a check valve. Two of the three NSCW pumps are needed to supply the required cooling flow necessary for system operation. If an NSCW pump fails, the standby pump in the same train is automatically started.

Each NSCW pump takes suction from its respective cooling tower basin and supplies flow to various components which are at higher and lower elevations with respect to the NSCW pumps. The cooling flow may be directed in two different paths as it is returned back to its respective cooling tower. During system cooling mode, the return flow discharges back to the tower through the cooling tower spray headers located at elevation 236 feet. This spray flow is directed by motor operated butterfly valves located within the cooling tower. Another return path is through a motor operated valve to the tower bypass header located at elevation 220 feet. This path is utilized during cooler weather when the cooling effect via the spray is not necessary.

During a postulated LOSP, the operating NSCW pumps would stop delivering flow through the system. Each pump's discharge check valve prevents back flow through the pumps and each motor operated valve remains in its position.

However, in the return piping, water would drain either through the respective tower's spray header or bypass line. With several coolers and associated piping at higher elevations relative to either the spray or bypass lines, voids in the system could be created.

Inside the containment building, each NSCW train supplies cooling flow for a non safety related Reactor Cavity Cooler located at elevation 208 feet, a non safety related Auxiliary Containment Air Cooler located at elevation 264 feet and a train of four safety related Containment Air Coolers located at elevation 241 feet. The Reactor Cavity and Auxiliary Containment Air Coolers share a common supply and return line. There are two separate supply and return lines associated with each train of Containment Air Coolers. Each supply and return line provides flow to two of the four Containment Air Coolers per train. Where each of these three separate supply lines enter containment, there is an outboard motor operated butterfly valve, followed by an inboard check valve located at each supply penetration. The return piping consists of a single outboard motor operated butterfly valve. Both the Auxiliary Containment Air Cooler and the Containment Air Coolers are susceptible to voiding flow during a MSLB/LOCA coincident with a LOSP as a result of their location within the NSCW system and the effects of fan coast down.

The existing Vogtle NSCW design incorporates a water hammer mitigation system that was designed during initial plant start-up. This system consists of a 4 inch bypass line around each pump's discharge isolation valve that is utilized to slow fill the system prior to the pump discharge valves commencing to open. This design was developed through startup testing, which determined, with no heat added in the Containment Air Coolers, voiding occurred in parts of the NSCW system. Therefore, while the system has been designed for slow filling to preclude water hammer, startup testing did not envelop the case of boiling in the Containment Air Coolers, which may occur under accident conditions.

Two-Phase Flow in Safety-Related Piping and Components

Once boiling commences in the Containment Air Coolers, there exists the possibility of two phase flow in the NSCW system. This two phase flow would be the result of the boiling concurrent with a pressure rise in the Containment Air Coolers. As the Containment Air Cooler pressure rises there exists the possibility of steam and water being drained from the system. To determine if two phase flow could exist in the NSCW system due to Containment Air Cooler boiling, a review of the Containment Air Coolers physical location and a flow calculation was performed.

Two phase flow exists when drain down takes place on long runs of horizontal piping which allows the steam to thoroughly mix with the water creating large

voids. This condition could result in high forces at changes in pipe direction. If the steam bubble formation and propagation is limited to the Containment Air Coolers and Auxiliary Containment Air Coolers and the vertical runs of pipe near the coolers, then two-phase flow will not exist because the steam bubble will always be located above the water.

The two-phase flow evaluation required a review of the NSCW system configuration and various operational configurations. The NSCW system was reviewed for the spray and bypass modes. Additionally, the Auxiliary Containment Air Cooler may be isolated, or the fan not operating, prior to the MSLB/LOCA. To determine the amount of drain down, these various system alignments were considered.

A series of calculations, assuming various system alignments, were performed to determine the extent of the air cooler voiding and the possibility of two phase flow in the NSCW system. These calculations were based on the following assumptions:

1. The water temperature inside the air cooler tubes reaches a constant temperature instantaneously. Thus the steam pressure inside the tubes is the same as the saturation pressure corresponding to the temperature of the containment environment during a MSLB/LOCA.

2. Possible cooler drain down is governed by system hydraulics and the saturation pressure developed in the air cooler tubes. This means that NSCW flow resistance will control drain down instead of the heat transfer into the tube.

3. Possible drain down from the initiating event to when the spray valves or bypass valves fully close is approximately 32.5 seconds There is also no back flow through the containment supply check valves.

Results of the Two-Phase Flow Analysis

The results from this analysis concluded that two phase flow does not occur in the NSCW system due to air cooler boiling. The voiding was limited to the Containment Air Coolers or the Auxiliary Containment Air Coolers and did not extend into any long horizontal runs of the NSCW piping system. Voiding of the system was limited because of the orifices installed on the air coolers and the NSCW system return. These orifices were installed to prevent boiling in the NSCW system due to high temperatures associated with the fan cooler discharges. Based on this review, the heat removal capabilities of the Containment Air Coolers during the postulated accident scenario will not be adversely affected.

Water Hammer Evaluation

In order to determine the effects of water hammer due to a steam bubble formation in the Containment Air Coolers and its subsequent collapse, a hydraulic analysis of the system was required. This hydraulic transient was performed using Bechtel's Hydraulic System Transient Analysis (HSTA) computer program. Because of similarities in the NSCW system piping between the Units and trains, Unit 1 train "A" was selected for transient, pipe stress, and support evaluation.

The hydraulic transient analysis was based on assumptions that maximize the conservatism in the model. The major assumptions utilized in the calculation are as follows:

a) With forced air flow (of the post-LOCA containment air) across the Containment Air Coolers and the Auxiliary Containment Air Coolers, any water in the tubes is assumed to boil instantaneously.
b) The NSCW outflow and boiling in the containment cooler units is assumed to void the 2 top coils on all 4 of the Containment Air Coolers. This results in the maximum amount of system voiding (approximately 38% of the Containment Air Coolers volume). This was shown to be a conservative assumption by running a sensitivity case that voided only the 2 top coils on 2 of the 4 Containment Air Coolers.
c) The vapor pressure in the refilling analysis is assumed to be approximately 0.8 psia. This may be conservative, depending on the mixing of the colder water in the supply and return cooler headers and piping.
d) In the hydraulic analysis, the cooler coils have been modeled as an equivalent pipe, not as individual cooler coil tubes. Because of this, the impacting water columns during the refill transient are idealized as two equivalent columns collapsing. In actuality, the impacts in the various cooler coil tubes would be occurring at different times and, therefore, not acting as a single equivalent impact. This would influence the magnitude and frequency of the pressure propagating in the supply and return piping.
e) The air being released from solution is conservatively ignored during the refill transient. Because the NSCW system is an open loop system, there will be dissolved air in the water and part of this air will be released during the boiling phase. Since this air does not go back into solution quickly, it would cushion the final impact of the water columns.

Based on the above assumptions, the conservatisms in this hydraulic analysis are very evident. Therefore, it would be expected that the calculated pipe stresses and support loads would also be conservative.

Drain down of the Containment Air Coolers and Auxiliary Containment Air Cooler can occur concurrent with the pump trip at the time of LOSP, however, this

drain down is limited by orifices in the return piping. The air cooler fan coast down is much slower than the pump coast down, therefore, fan coast down can introduce a forced steam/air mixture (containment atmosphere during a MSLB/LOCA) across the Containment Air Coolers and the Auxiliary Containment Air Cooler. Because of the NSCW system design, there will be a short duration when there is no forced flow in the Containment Air Coolers or the Auxiliary Containment Air Coolers. The rapid introduction of saturated steam/air mixture across the stagnant air coils would lead to boiling in the cooler coils. This boiling would result in a temperature increase and pressure build-up inside the cooler coils.

The following cases were evaluated for different operating configurations of the system:

Case 1

For this case, the Auxiliary Containment Air Coolers are not operating (i.e., the Auxiliary Containment Air Coolers are isolated or the fans are not running) before the MSLB/LOCA, thus this cooler is not assumed to boil or drain. The top 2 coils on all of the Containment Air Coolers which are at a lower elevation are drained and consist of steam at the time the NSCW pumps restart. As previously defined, this results in the maximum calculated system drain down.

Case 2

For this case, the Auxiliary Containment Air Coolers are operating prior to the MSLB/LOCA. Maximum drain down in this case would be to drain down the Auxiliary Containment Air Coolers to elevation 256 feet and steam pressure as a result of this case would prevent voiding in the Containment Air Coolers.

Using the cases above, peak pressures and forcing functions on piping segments inside the containment structure were calculated. Case 2, is the normal mode of operation, with the Auxiliary Containment Air Coolers having flow through them and the fans operating at the start of the MSLB/LOCA resulted in peak water hammer pressures of 350 psia in the piping system. Maximum column rejoining velocities were approximately 5 feet per second and the maximum peak force predicted was less than 12,000 pounds. The majority of the calculated forces were less than 10,000 pounds. The results from Case 1 were used for evaluation purposes because they were the most limiting. The maximum peak water hammer pressure predicted was 900 psia and occurred inside the Containment Air Cooler finned tubes. The maximum column rejoining velocities were approximately 18 feet per second, while the maximum peak force predicted was less than 20,000 pounds. The majority of the calculated forces were less than 10,000 pounds. Utilizing the data acquired from Case 1, further analyses was undertaken to

determine if the predicted pressures and forcing functions would have any adverse effects on the NSCW system piping, components, or supporting structures.

Results of the Water Hammer Evaluation

The analysis of the water hammer pressure spikes on the Containment Cooling Units indicates that the elevated pressures will not have a detrimental effect on the cooler tubes, welds or other connections. The pressure spikes experienced because of the water hammer exceed the design pressures of the system. However, none of the stresses in the piping exceed the ASME code allowables for the piping material. The valves and flanges do exceed their pressure rating because of the 900 psia pressure spike. Although the pressure spike exceeds nominal pressure rating of the flanges and valves, it does not result in stresses greater than yield. Therefore, based on an engineering evaluation, the piping, valves, and flanges will not fail and the system will be capable of performing its intended safety-related function.

The calculated forcing functions from the water hammer analysis were used as inputs in the dynamic piping stress models to determine piping stresses and support loads due to the water hammer event. This analysis was performed based on the water hammer transient being a faulted condition, therefore, the applicable stress limits were based on faulted allowables. The pipe stress analysis, which included the water hammer loads, indicates that some locations on the NSCW piping system exceed the ASME Section III, service level "D" limits. The locations with the highest stresses were on drain lines, with single or a double isolation valve, where the lines connect to the large-bore piping. The stresses on these drain lines exceeded the piping material yield stresses. However, a plastic analysis has been performed that demonstrates that the piping at these locations will remain intact and capable of performing its safety-related function.

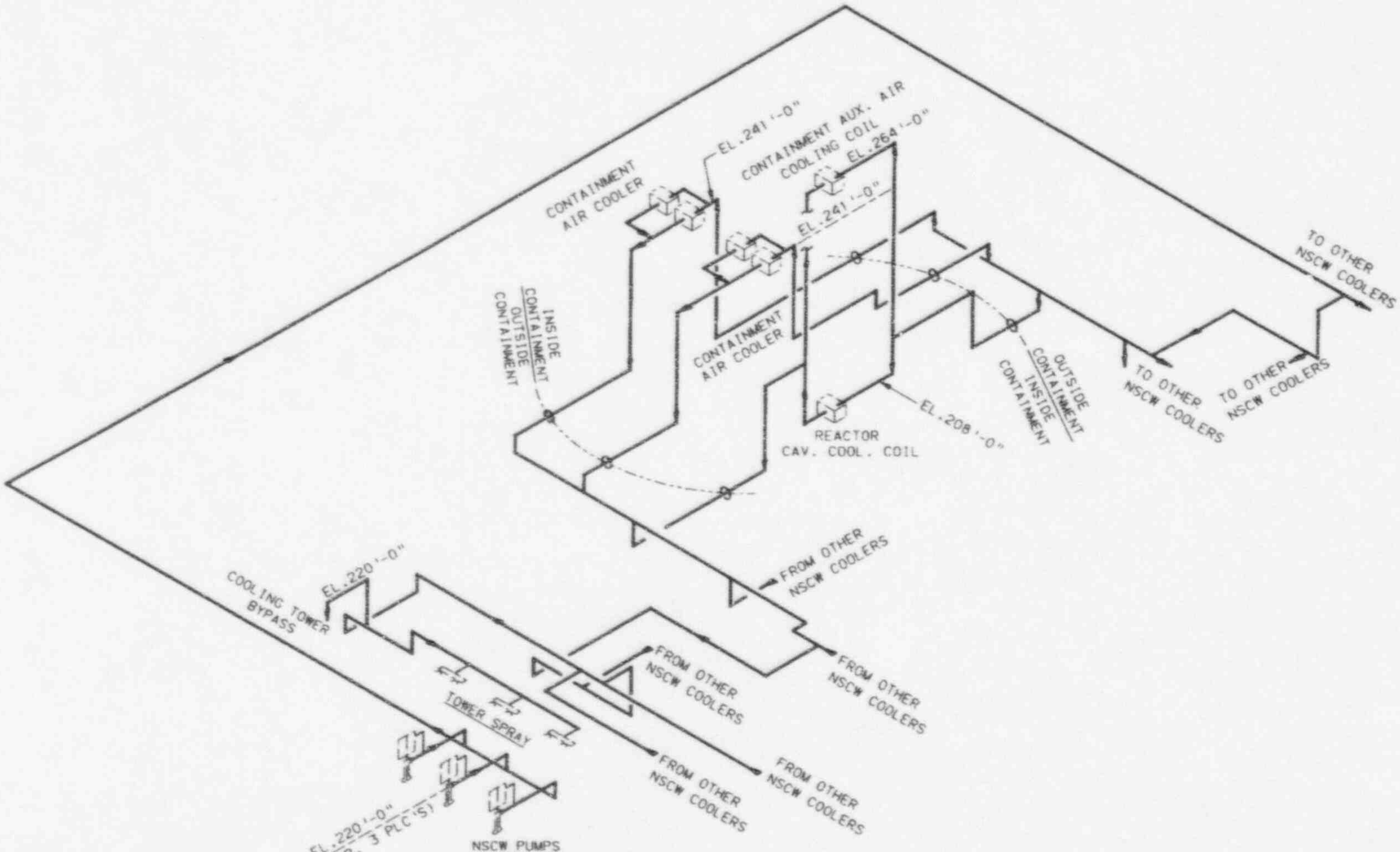
The NSCW system piping supports were also reviewed for the calculated water hammer loads. Detailed engineering reviews indicate that some of the loads do not meet the Vogtle Design Criteria. However, all piping supports, except one vendor supplied strut, meet the level "D" service limits defined in the 1983 edition of the ASME Section III, Subsection NF code. The strut that does not meet the level "D" service limits, does meet the requirements of ANSI/AISC N690 (Specification for the Design Fabrication and Erection of Steel Safety Related Structures for Nuclear Facilities) for the abnormal extreme category. Therefore, based on these reviews, the piping supports will remain intact and capable of performing their intended safety-related function.

Further analyses will be performed to determine if modifications, or system operational changes, will be required to reduce the stresses to within code and the Vogtle design requirements. This analysis will be complete by July 31, 1997 and

any required modifications will be implemented prior to the completion of the Unit 1, eighth refueling outage scheduled during the Spring of 1999 and the Unit 2, sixth refueling outage scheduled during the Spring of 1998.

SKETCH 1

SIMPLIFIED NSCW SYSTEM PIPING SCHEMATIC



Enclosure II

Overpressurization of Isolated Piping

Actions taken in response to the requested actions noted in GL 96-06

Requested Action from GL 96-06

2) "Determine if piping systems that penetrate the containment are susceptible to thermal expansion of fluid so that overpressurization of piping could occur."

GPC Response

Background

In response to information concerning the potential for thermally-induced overpressurization of water-filled, isolated piping inside the containment building, a system-by-system review of the associated configurations at Vogtle was performed. The review considered water filled containment penetration piping and certain isolated system piping within the containment. The purpose for this review process was; 1) to identify penetrations in which sections would potentially be susceptible to overpressurization occurrences, 2) establish an immediate basis for acceptability of the potentially susceptible piping configurations, and 3) to establish, as appropriate, plans for long-term corrective actions to increase the level of functional assurance.

Using FSAR Table 6.2.4-1 and the P&IDs for Vogtle Unit 1 and 2 as guidance, all penetrations (111/unit) were screened for susceptibility to thermally induced overpressurization. An initial screening was performed to reduce the number of penetrations to be reviewed. Penetrations that met the following criteria did not require a detailed engineering evaluation since they would not be susceptible to overpressurization:

1) Containment penetrations that had relief valves installed between the containment isolation valves. These relief valves will be reviewed for addition to the Vogtle IST program.
2) Containment penetrations that had a check valve inside of containment oriented to relieve fluid expansion.
3) Containment penetrations that were not water filled.
4) Containment penetrations that contained fluid at temperatures greater than, or equal to the MSLB/LOCA environment conditions.
5) Containment penetrations for instrumentation qualified for post-accident conditions.
6) Containment penetrations that are open to containment atmosphere.

Based on this screening, 30 penetrations for both units (15 per unit) were determined to be potentially susceptible and required further evaluations. These penetrations are:

Description	Containment Penetration Number	Penetrations per Unit
Accumulator Sample Lines	72A, 72B, 73A, 73B	4
Accumulator Test and Drain Line	41	1
Auxiliary Component Cooling Water (ACCW) Supply	28	1
Steam Generator Wet Lay-Up Chemical Addition	11A, 12A, 69A, 69B	4
Normal Containment Sump Pumps Discharge	78	1
Post-Accident Sampling System (PASS) Return to Containment	86C	1
Purification Water Supply to Refueling Cavity	15	1
RCS Hot-Leg (PASS) Sample Line	24	1
Reactor Coolant Drain Tank (RCDT) Pump Discharge	77	1

Overpressurization of Isolated Piping Evaluation

The 30 penetrations required additional review because they did not meet the screening criteria and are systems that do not have a designed system to eliminate overpressurization during a high temperature accident in containment. The systems served by these penetrations are not required to operate post-accident, except for the RCS Hot-Leg to the Post-Accident Sampling System (PASS) panel and the Post-Accident Sampling System Return to the Containment. These lines serve the PASS and may be required to operate post-accident to be able to obtain the required samples.

Penetrations that are Protected by Globe Valves

- Accumulator Sample Line

This penetration has been reviewed and found to be acceptable because of the specific configuration of the inside and outside containment isolation valves. This penetration is equipped with an air operated globe valve inside and outside of containment. The inboard containment isolation valve has flow under the seat with respect to the containment penetration. With this configuration, the pressure in the penetration will tend to lift the globe valve's

disk, thereby, relieving the pressure. This inboard globe valve for these penetrations will begin to open before the penetration piping would be adversely affected by overpressurization. Therefore, these penetrations are acceptable for short-term operation and will have no adverse impact on any safety-related component if this overpressurization were to occur.

Penetrations that exceed code allowables, but do not result in catastrophic failure

- Accumulator Test and Drain Line
- Steam Generator Wet Lay-Up Chemical Addition
- Normal Containment Sump Pumps Discharge

These penetrations have been reviewed and it was concluded that the potential exists for overpressurizing the piping between the inside and outside containment isolation valves. For short-term operability, the use of a strain based methodology was employed. The assumptions used in this analysis were as follows:

1) Initial fluid temperature is approximately 80°F.
2) Final fluid temperature is approximately 300°F.
3) The piping will yield before the inboard or outboard containment isolation valves.

Therefore, based on these assumptions, the water trapped in the above penetrations will experience an 8.55% increase in specific volume from the increasing temperature rise from 80°F to 300°F. This 8.55% increase in specific volume is conservatively assumed to result in an 8.55% increase in the trapped piping system volume. Therefore, the pipe would experience an 8.55 % increase in volume and a corresponding 4.2% increase in the pipe diameter, which is also the strain in the pipe wall. The pipe material for the penetrations, or piping systems, is ASME SA-312, TP304L or ASME SA-106, Grade B. The minimum transverse elongations are 25% for SA-312 TP304L piping and 12% for SA-106, Grade B piping. The 4.2% calculated strain is much less than the minimum elongation of these materials. Although not specifically utilized for pressurized water reactors (PWRs), Appendix T of ASME Section III, code case N-47 (Class 1 Components in a Elevated Temperature Service) allows a local strain of up to 5% for normal operating conditions. The calculated 4.2% strain is less than these allowables. Since there are no specific requirements for strain control for service level 'D', this condition is acceptable in the short-term.

In conclusion, the penetrations may exceed ASME Code Allowable Stresses, however, they are acceptable for short-term operation in this condition. These penetrations are not required to be used to mitigate the consequences of any accident. There will be no failure of the piping or

penetration that would adversely affect containment integrity.

Penetrations that are Equipped with Valves that will not Allow Overpressurization

- Auxiliary Component Cooling Water (ACCW) Supply
- Purification Water Supply to Refueling Cavity
- Reactor Coolant Drain Tank (RCDT) Pump Discharge

Auxiliary Component Cooling Water (ACCW) Supply

These valves are 10", ANSI 150# Fisher model 9280 butterfly valves containing EPT valve seats. Because these valves have soft seats, overpressurization of the piping between the valves would lead to a small amount of leakage past the seats before the pressure increased to a point where the piping would be damaged. Therefore, containment integrity would be maintained and there would be no adverse impact to the function of any safety-related component as a result of this overpressurization event.

Purification Water Supply to Refueling Cavity
Reactor Coolant Drain Tank (RCDT) Pump Discharge

The valves associated with the Purification Water Supply to the Refueling Cavity are 3", ANSI 150#, manually operated ITT Grinnell diaphragm valves with Nordel, EPT or EPDM, diaphragm material. The valves on the RCDT Pump Discharge are 3", ANSI 150#, air operated ITT Grinnell diaphragm valves with Nordel, EPT or EPDM, diaphragm material. Because these valves have soft seats, overpressurization of the piping between the valves would probably lead to leakage past the seats before the pressure increased to a point where the piping would be damaged. Therefore, containment integrity would be maintained and there would be no adverse impact to the function of any safety-related component as a result of this overpressurization event.

However, if these valves did not allow adequate seat leakage to prevent the containment penetration from overpressurizing between the containment isolation valves then the argument concerning the piping strain would be applicable (see above discussion). In either case, the containment penetration assembly will be capable of performing it's function of providing containment integrity.

Penetrations with Valves that are Required to Operate Post-Accident

- RCS Hot-Leg (PASS) Sample Line
- Post-Accident Sampling System (PASS) Return to Containment

RCS Hot-Leg Sample Line

The line is used to obtain RCS samples during normal operation and to provide RCS fluid to the PASS after an accident. This penetration is equipped with inboard and outboard containment isolation valves (there are actually two outboard containment isolation valves, one going to the normal sampling system and the other going to the PASS). During normal operation if the valves are open and RCS is flowing to the sampling area, the RCS fluid will be at temperatures greater than the post -MSLB/LOCA environment temperatures (the flow path to the PASS is not used during normal plant operation). Therefore, no overpressurization of this penetration would be expected. However, if the flow path is isolated, either by the inboard or outboard containment isolation valve during normal operation and an accident were to occur, the other containment isolation valve would close on the containment isolation signal, and the penetration could potentially overpressurize due to the trapped fluid. Because of this possibility, controls are in place to instruct the operators to close both the inboard and outboard valves if this flow path is isolated during normal operation. If both valves are isolated, hot RCS fluid will be trapped between the containment isolation valves and no overpressurization would occur.

Post-Accident Sampling Return to Containment

This line is part of a system that may be required to operate after a MSLB/LOCA. Therefore, allowing the isolated piping at this penetration to over-strain is not justifiable because the pressures involved may prevent the valves from being opened. Although this penetration is normally drained, post-accident operation of this system could result in the piping between the containment isolation valves becoming water filled. To eliminate the concerns with overpressurization of this penetration, plant procedures have been revised to first close only the outboard containment isolation valve and after 30 minutes close the inboard containment isolation valve. This operation allows for the heatup of the fluid prior to isolation of the penetration. Therefore, the potential for overpressurization will not exist.

Results of the Overpressurization of Isolated Piping Evaluation

Based on the above reviews, the containment penetrations remain capable of

performing their intended safety-related function. Several of the existing penetration designs could result in the piping stresses being outside of the ASME code allowables following a design bases accident. However, the stresses are not such that failure of the penetration or connected piping will occur. The penetrations will continue to perform their safety-related function.

Procedures have been revised for the post-accident sampling return to containment to ensure that the outboard containment isolation is closed first when this system is used following a design basis event, and, the inboard valve will be closed after 30 minutes. If the outboard valve is closed first and the inboard valve is closed after 30 minutes, there is no potential for overpressurizing the system penetration. Also, controls are in place for the RCS Hot-Leg sample line to ensure that if this flow path is not being used, both the inside and outside containment isolation valves would be closed. This would allow RCS fluid to be trapped in this penetration at high temperature and post-MSLB/LOCA temperatures will not cause the penetration to overpressurize.

Analysis will continue to determine if modifications to the systems, or changes to system operation, are required to alleviate the above conditions. This analysis will be complete by June 30, 1997 and any required modifications will be implemented during the Unit 1, seventh refueling outage scheduled during the Fall of 1997 and the Unit 2, sixth refueling outage scheduled during the Spring of 1998.