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October 3, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ULNRC-938

Dear Mr. Denton:

DOCKET NUMBER 50-483
CALLAWAY PLANT, UNIT 1
REVISION TO TECHNICAL SPECIFICATION 4.6.1.2 AND
3/4.6.1.2 BASES

Reference: ULNRC-875 dated 7/17/84

This submittal provides further information on the referenced application for Amendment to Facility Operating License No. NPF-25 for the Callaway Plant, Unit 1. Attachment 1 provides additional justification for the proposed changes which supplements the discussions in Enclosures A and B of the reference. Attachment 2 provides a simplified schematic of the piping providing the seal inventory. Attachment 3 details the calculations supporting the leak rate acceptance criterion for the ESW valves in question. Attachment 4 provides the requested changes, revised since the referenced submittal per initial Staff review and a reverification of the supporting calculation for the leak rate acceptance criterion.

The proposed changes would become effective for Union Electric implementation upon NRC approval. The attachments serve to facilitate Staff review.

Very truly yours,

Robert J. Schukai
for Donald F. Schnell

GGY/lkr

Attachments 1 - 4

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STATE OF MISSOURI)
)   S S
CITY OF ST. LOUIS)

Robert J. Schukai, of lawful age, being first duly sworn upon oath says that he is General Manager-Engineering (Nuclear) for Union Electric Company; that he has read the foregoing document and knows the content thereof; that he has executed the same for and on behalf of said company with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By Robert J. Schukai

Robert J. Schukai
General Manager-Engineering
Nuclear

SUBSCRIBED and sworn to before me this 3rd day of October, 1984

Barbara J. Pfaff

BARBARA J. PFAFF
NOTARY PUBLIC, STATE OF MISSOURI
MY COMMISSION EXPIRES APRIL 22, 1985
ST. LOUIS COUNTY

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ATTACHMENT ONE

Union Electric proposes to test the containment isolation valves serving the containment air cooler supply and return ESW lines with water (hydrostatic) in lieu of an air test medium because of the following design provisions:

1. There is a source of sealing water.

2. The system boundary inside containment is designed to engineered safety feature criteria.

3. The acceptance criteria of 10 CFR 100 are satisfied.

As stated in SRP 6.2.6: "Hydrostatic testing of containment isolation valves is permissible if the line is not a potential containment atmosphere leak path, and may be found acceptable if it can be demonstrated in accordance with the requirements of Section III.C of Appendix J, that a liquid inventory is available to maintain a water seal (while assuming the single failure of any active component) during the post-accident period. Limits for liquid leakage should be assigned to these valves based on analysis and included in the plant Technical Specifications."

The ESW system is a closed ESF system inside containment and, given any active component failure in the short or long term, no radioactive leakage (liquid or air) from the containment would result. The Callaway SER (NUREG-0830) confirms the acceptability of the ESW piping inside of the containment to serve as a passive boundary against leakage. Page 6-16 contains the following statements. "It should be noted that the essential service water lines to and from the containment air coolers should actually be considered under GDC 57 because they are neither part of the reactor coolant boundary nor connected directly to the containment atmosphere. However, the essential service water system--because it is designed and constructed to Safety Class 3 instead of Safety Class 2--does not meet the precise requirement of a "closed system" inside containment (SRP Section 6.2.4.11.9) which is necessary, in addition to an isolation valve outside containment, to ensure two containment isolation barriers. Therefore, the applicant has imposed the GDC 56 requirements for one isolation valve inside containment and one isolation valve outside containment. The isolation valves for each essential service water system penetration are powered from the same power source to ensure the single-failure-proof design of the essential service water system. The staff has reviewed the isolation provisions of the essential service water system lines and finds them acceptable."

With respect to the system not meeting the precise requirements of a closed system inside containment, the effects of a passive failure are addressed as follows.

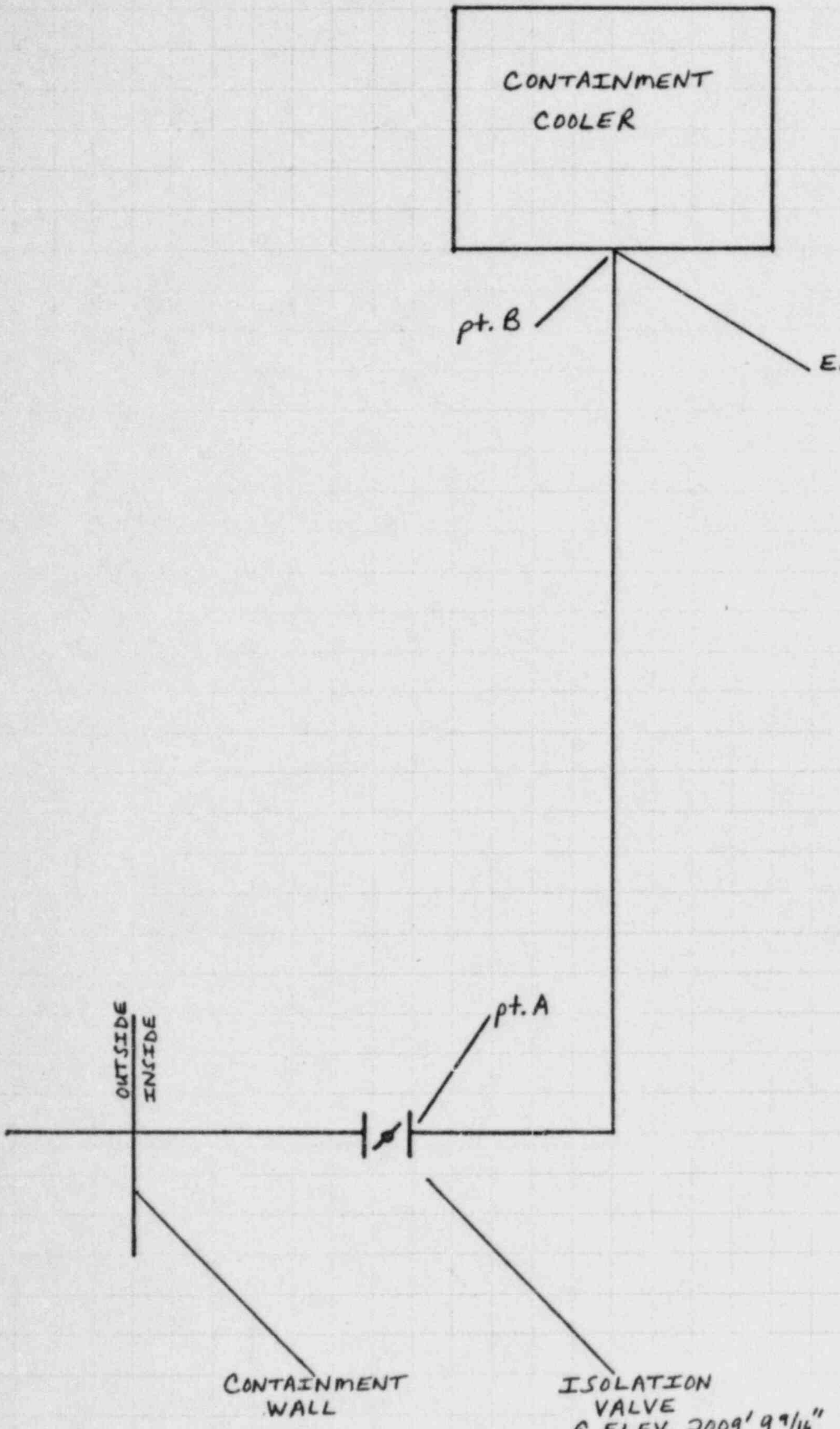
Passive failures in ESF systems are postulated during the long term post-accident phase in accordance with FSAR Section 3.1.1 and in accordance with NRC guidelines. When passive failures are postulated in the long term (24 hours), no single active failures need be considered; therefore, the ESW pumps and all valves would be operable. As noted in FSAR Section 3.1.1.4, passive component failures when applied to fluid systems mean abnormal leakage from a single sprung flange, a single pump seal failure, or a single valve stem packing failure, and not from a piping failure. This definition of a passive failure is in agreement with the NRC staff position stated in Issue #7 of NUREG 0138.

The NRC staff has previously accepted the use of water contained in piping systems as seal water systems meeting the intent of Appendix J, Section III.C. This section of Appendix J allows hydrostatic testing of containment isolation valves served by a seal system provided that the valve leakage rates do not exceed Technical Specification limits and that the fluid seal water system inventory is sufficient to assure a sealing function for 30 days. Appendix J does not imply that the seal system is to be pressurized to 1.1 Pa following an accident. The fluid contained in the ESW piping inside containment meets these requirements.

If the SRP criteria are used to determine the allowable leakage rate (assuming a single active failure), there would be no depletion of the contained fluid and the volume would last indefinitely since there would be no air leakage into the system to force the water out. In the case of a credible passive failure (during the long term) of a sprung containment air cooler flange, air leakage into the piping would occur if the ESW pumps were turned off. Turning the pumps off would not be necessary since, in postulating only a passive failure, the containment isolation valves would be operable and the pumps could continue to perform their function. Union Electric is proposing a Technical Specification leakage limit for these valves of 7000 ml/hr when pressurized to 1.10 Pa.

This limit ensures that a 30 day water volume will be available in the piping system. The water volume from the air cooler to the nearest containment isolation valve would be depleted in 30 days if the leakage rate were greater than 7166 ml/hr. It should be noted that the pressure in an isolated air cooler train would approximate the containment atmospheric pressure which would be near atmospheric pressure after 1 day, which is the earliest time a passive failure is postulated. If surveillance testing demonstrated leakage greater than 7000 ml/hr for any of these four valves, then a violation of containment integrity would exist and the ACTION statement of Technical Specification 3.6.1.1 would be entered. Repairs would be effected and the leakage limit satisfied prior to entering mode 4, hot shutdown.

ATTACHMENT TWO



ATTACHMENT THREE

CALCULATION SUMMARY

I. Inside diameters of piping between points A and B of attachment two:

Nominal Diameter	ID
14 inch (standard 0.375 inch wall thickness)	13.25 inch
10 inch (Schedule 40)	10.020 inch
8 inch (Schedule 40)	7.981 inch
6 inch (Schedule 40)	6.065 inch

II. Pipe lengths between points A and B for the four pipe diameters:

Case	Nominal Diameter	Length
1. From EF-HV-33 to containment coolers A and C	14 inch	153.88 ft.
	10 inch	43.91 ft.
	8 inch	36.46 ft.
	6 inch	32.70 ft.
2. From EF-HV-45 to containment coolers A and C	14 inch	140.78 ft.
	10 inch	46.98 ft.
	8 inch	42.73 ft.
	6 inch	34.15 ft.
3. From EF-HV-34 to containment coolers B and D	14 inch	8.85 ft.
	10 inch	314.88 ft.
	8 inch	31.31 ft.
	6 inch	32.71 ft.
4. From EF-HV-46 to containment coolers B and D	14 inch	10.35 ft.
	10 inch	310.20 ft.
	8 inch	33.38 ft.
	6 inch	35.90 ft.

III. Water inventories (volumes) for the four cases from Section II above:

Case	Volume
1	190.6 cubic feet
2	182.2 cubic feet
3	198.3 cubic feet
4	198.5 cubic feet

IV. Allowable leakage rate for 30 day seal (using minimum volume from Case 2):

$$\left[\frac{182.2 \text{ cubic feet}}{30 \text{ days}}\right]\left[\frac{28{,}317 \text{ ml/cubic foot}}{24 \text{ hours/day}}\right] = 7166 \text{ ml/hr}$$

Thus, for conservatism, the limit has been set at 7000 ml/hr.

ATTACHMENT FOUR

MARKED TECHNICAL SPECIFICATIONS, BASES, AND FSAR