UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DEC 0 6 1984

Docket Nos.: 50-440
and 50-441

MEMORANDUM FOR: B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing

FROM: John J. Stefano, Project Manager
Licensing Branch No. 1
Division of Licensing

SUBJECT: REPORT OF MEETING WITH THE CLEVELAND ELECTRIC ILLUMINATING COMPANY (CEI) TO DISCUSS PERRY CONTAINMENT BYPASS LEAKAGE DESIGN AND LOCA-RELATED POOL DYNAMIC LOADS

The meeting was held in Bethesda, Maryland on November 15, 1984, at the request of CEI, to: (a) discuss the design basis and allowables for containment bypass leakage; and (b) discuss NRC staff comments on CEI submittals (dated June 20, 1983 and July 11, 1984) addressing SER Outstanding Issue (9), LOCA-related pool dynamic loads. Enclosure 1 contains the list of those who attended or participated in the meeting; Enclosure 2 contains the handout of a brief presentation made by CEI, and a draft letter responding to NRC questions related to containment leakage testing and containment isolation provisions, discussed at the meeting. The meeting was announced in the PDR by my memo to you dated October 22, 1984. The representative from GAP tape recorded the meeting proceedings on behalf of S. Hiatt (OCRE), who was unable to attend the meeting.

A summary of the actions concluded at the meeting based on the discussions which transpired follows:

A. Containment Bypass Leakage

1. In finalizing the draft responses to NRC questions -- see CEI's draft letter contained in Enclosure 2 -- CEI will describe how containment leakages were determined, including the use of drywell purging directed to outside containment during Operating Mode 2; and how feedwater bypass leakage and MSIV leakage are accounted for in the containment leakage test program.

2. With respect to drywell purge, CEI will clarify the use of the 2-inch and 36/42-inch lines and the routing through filtering systems, providing supporting analyses and technical justification. (The NRC staff suggested that CEI consult with Mississippi Power and Light, the Grand Gulf BWR/6 licensee, in developing this response.)

3. With respect to feedwater systems/bypass leakage limits, CEI will clarify how feedwater leakage is handled and the extent to which conservatisms were used in developing leakage limits. CEI will also address related radiation dose rates calculated which are required for consultation with the NRC Accident Evaluation staff, not represented at the meeting.

4. In conjunction with "other" penetrations identified by the staff which may be bypass leakage paths (e.g., isolation valves and instrument lines), CEI is to consider these potential sources of bypass leakage in determining allowables, or justify why they are not considered as bypass leakage paths, and update the FSAR accordingly.

5. The NRC staff agreed to provide CEI with guidance in the treatment of line leakages versus valve leakages per 10 CFR 50, Appendix J requirements the week of November 19, 1984. (On November 19, 1984, CEI was advised that Perry allowable leakages for valves, seals, hatches and other penetrations should be summed and not exceed $0.6L_a$. Any deviation exceeding $0.6L_a$ will require CEI to submit an exemption request with related technical justification, assessment of risk, environmental impact, etc. for Commission approval prior to Unit 1 licensing).

B. LOCA-Related Pool Dynamic Loads

1. CEI will provide details on how froth loads (impact and drag) were developed for gratings and other structures greater than 19 feet above the initial pool surface.

2. CEI will document the assumptions and methodology used in the development of the Perry LOCA bubble submerged structure drag loads, including: (a) use of absolute delta P across submerged structures; (b) use of a DLF based on a triangular pulse shape; and (c) varying the load consistent with the natural frequency of the submerged structures.

3. CEI will document the information needed to support the statement that LOCA loads will always bound the CO loads in a dynamic sense; i.e., they will document that all structures have natural frequencies greater than $25H_z$ (except columns which are greater than 17 H_z).

4. CEI will also provide information described under Item 3 (immediately above) for the statement that LOCA SRV loads always bound chugging SRV loads.

5. CEI will provide the details of the SRV submerged structure drag loads methodology, including: (a) use of absolute delta P; (b) use of a DLF based on idealized sinusoidal wave form; and (c) varying the load over the entire frequency range of interest.

6. CEI will correct statements made in the FSAR to reflect that Figures 3B-71, 3B-72 and 3B-75 of GESSAR-II are not applicable to Perry.

7. CEI will provide the geometries of the pool swell deflectors for piping and valves above the pool.

8. CEI will state that there are no structures above the initial pool surface that fall outside the load definition envelope of GESSAR-II, as modified by Appendix C of NUREG-0978, or provide the details of the unique structures and their unique load definitions.

9. CEI will provide further information with regard to the effect on pool swell of the extensive grating at the 599-ft elevation as follows: (a) maximum best estimate value of the containment boundary pool without the inclusion of gratings in the analysis; and (b) a complete description of methodology used, including why weir grating loss is of interest for pool swell; how the loss coefficients were determined; the relative areas of I-beam flanges and open areas; and the bubble pressure histories/pool surface profiles for both the clean pool and grating-covered pool cases, not addressed in the July 11, 1984 submittal from CEI.

CEI will advise when we may expect to receive responses to the items highlighted above, in order that a timely staff review schedule can be negotiated.

ORIGINAL SIGNED BY:
John J. Stefano, Project Manager
Licensing Branch No. 1
Division of Licensing

Enclosures: As stated

cc: See next page

DISTRIBUTION:
See attached page

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12/4/84	12/4/84	12/6/84

PERRY

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ENCLOSURE 1

NRC/CEI MEETING ON PERRY CONTAINMENT

LEAKAGE/POOL DYNAMIC LOADS

NOVEMBER 15, 1984

NRC

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A. Notafrancesco, CSB/DSI
M. Fields, CSB/DSI 1/

BNL

G. Maise, NRC Consultant 1/

CEI

E. Buzzelli - Licensing
R. Pender - Engineering
M. Schumack - Engineering

Illinois Power Company (Clinton)

P. Telthorst 1/

GAP

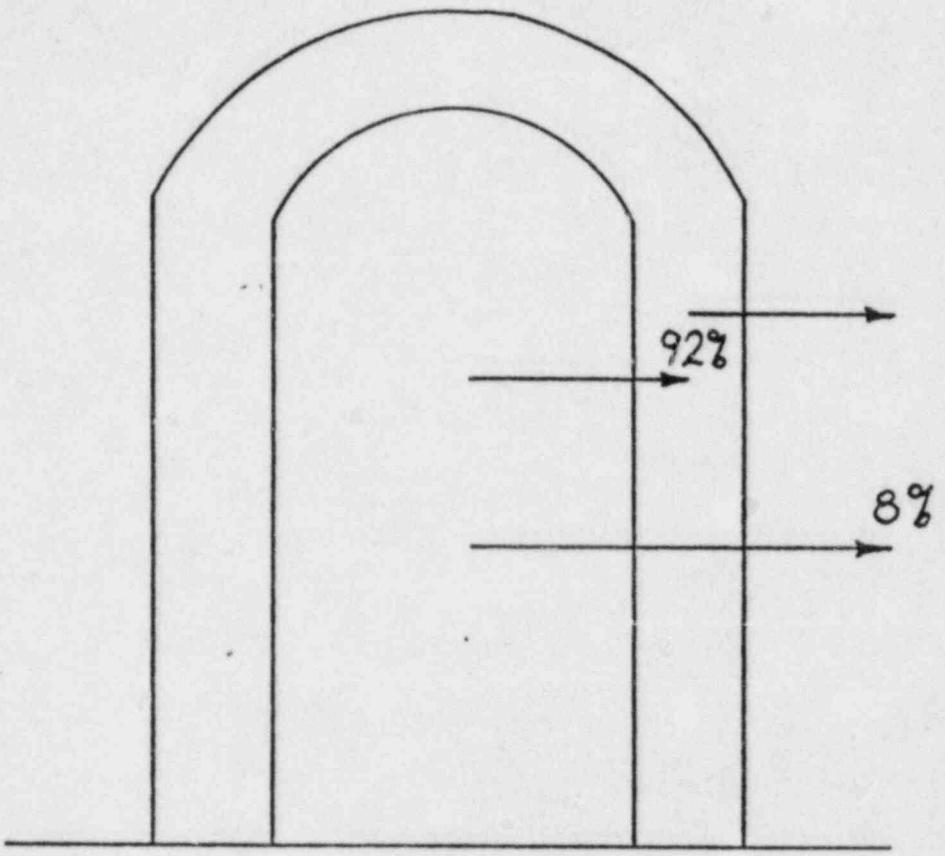
D. Schlemmer

Gilbert Associates

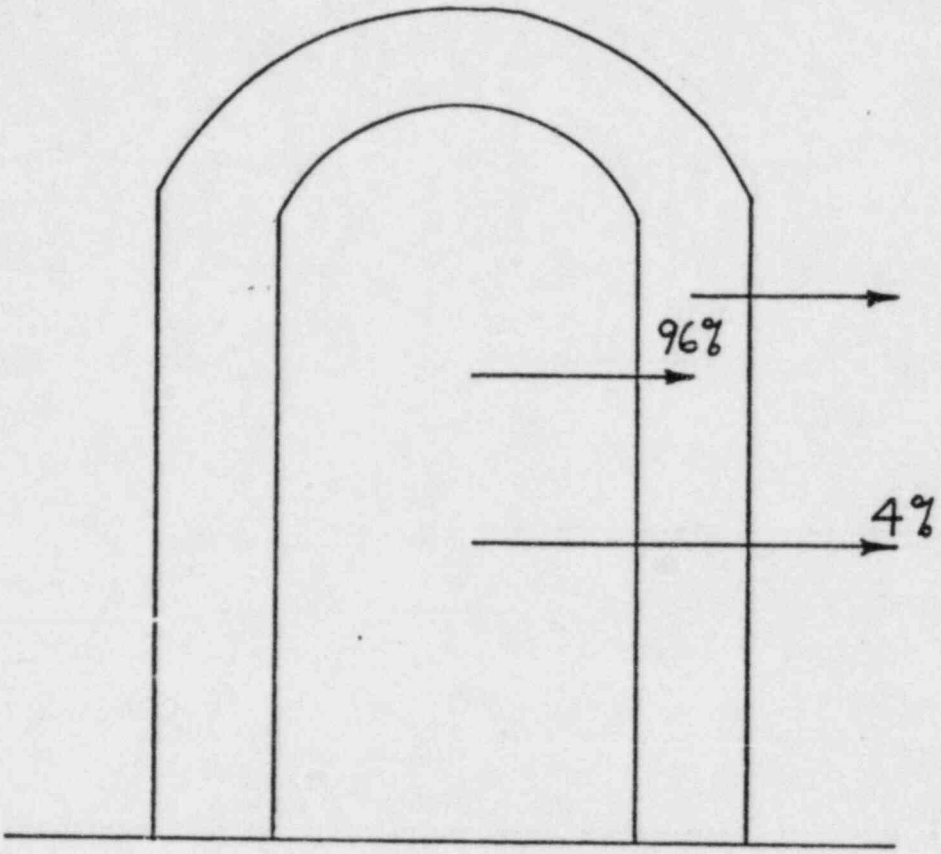
M. Waselus
P. Bunker

1/ Afternoon session of the meeting only

ENCLOSURE (2)



L_a = .1% mass/day



L_a = .2% mass/day

NEW LIMIT DETERMINATION

SUMMED VALVE SPECIFICATION LEAKAGES

⇓

TOOK VALVE SPECIFICATION LEAKAGES AS A PERCENTAGE OF CONTAINMENT NET FREE AIR VOLUME AND DIVIDED BY 75%

⇓

TOOK EXPECTED WATER LEAKAGE

⇓

PERFORMED OFFSITE DOSE ANALYSIS

DISCOVERED NEED TO INCREASE FEEDWATER VALVE ALLOWABLE AIR LEAKAGE

⇓

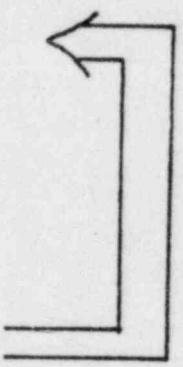
ASSUMED HIGHER FEEDWATER VALVE LEAKAGE

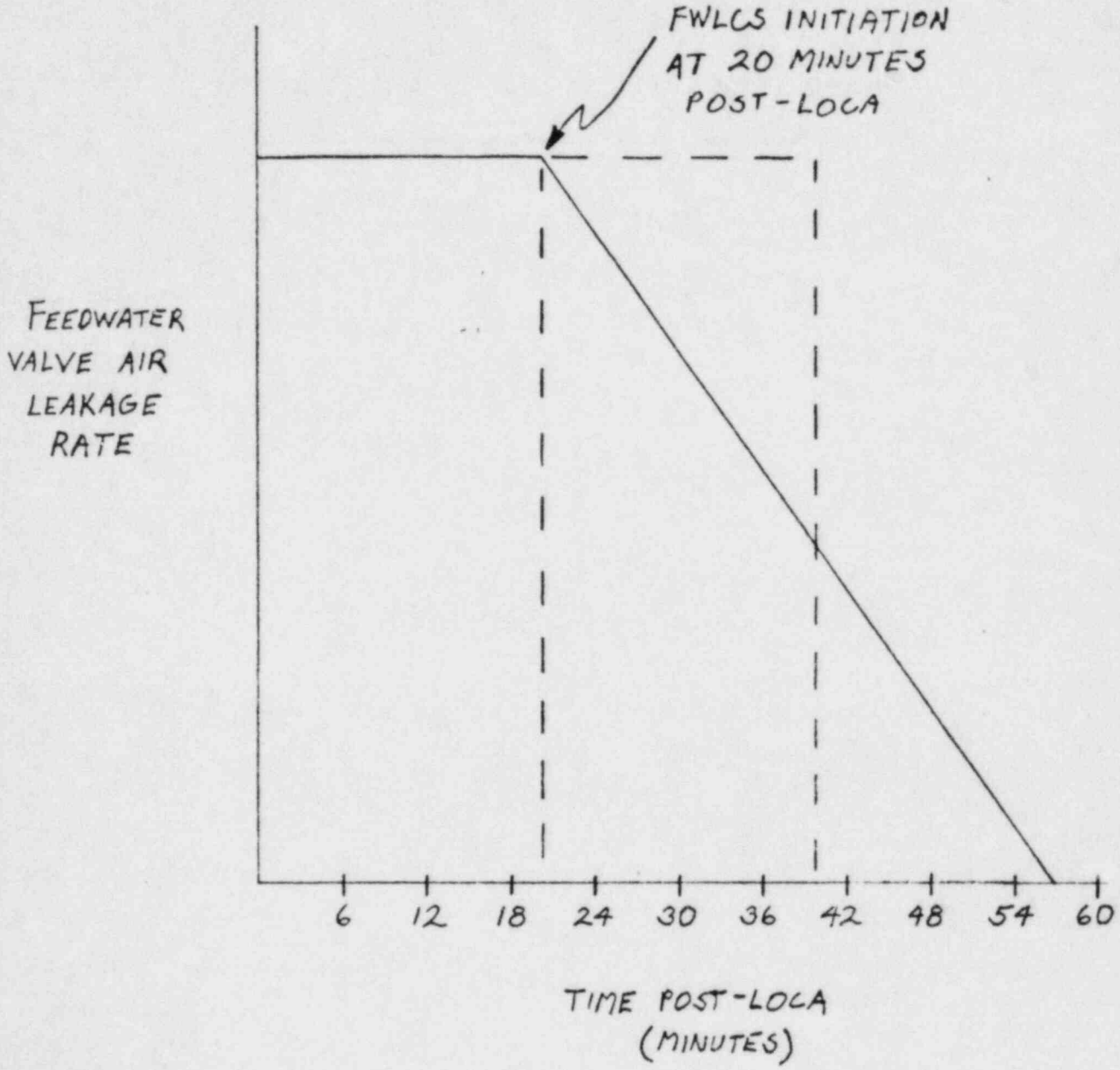
⇓

PERFORMED OFFSITE DOSE ANALYSIS

⇓

COMPARED WITH 10CFR100 OFFSITE DOSE LIMITS





$\{ L_a = 0.2\%$ mass/day $\}$

POST-LOCA OFFSITE DOSES

[L_a = 0.2% mass/day]

	0-2 hr. dose, exclusion area boundary, rems		0-30 day dose, low population zone, rems	
	Thyroid	Whole Body	Thyroid	Whole Body
10 CFR 100 Limit	300	25	300	25
NRC calculated [1]	88	6.6	122	2.3
CEI-calculated [2], based on 4%	101	5.68	142	4.07
CEI-calculated; based on 6.72%	178.5	not avail.	253.5	not avail.
CEI-calculated; only water leakage + annulus fix	40	not avail.	35	not avail.
CEI-calculated; only FW leakage of 11.72 scfh (constant) for 40 minutes	81.1	not avail.	10	not avail.
CEI-calculated; based on 6.72% + water leakage + annulus fix + 11.72 scfh (constant) for 40 minutes	299.6	8.1	298.5	4.8

POST-LOCA CONTROL ROOM DOSES

	Beta Skin, rems	Whole Body, rems	Thyroid Inhalation, rems
Regulatory Limit	75*	5**,*	30*
CEI-calculated [2], 4%	28.2	3.78	13.2
CEI-calculated, 6.72% 11.72 scfh (constant) for 40 minutes	36.7	2.1	27.6

[1] SER, table 15.1

[2] FSAR, table 15.6-15

*From SRP, chap. 6.4, sec. II.6.

**From GDC 19, 10CFR50, App. A

PROPOSED NEW LIMITS

ALLOWABLE: 8.07 SCFH + 11.72 SCFH FOR FEEDWATER LINES

TECH SPEC LIMIT: 6.05 SCFH + 8.79 SCFH FOR FEEDWATER LINES

75% of allowable

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

P.O. BOX 5000 - CLEVELAND, OHIO 44101 - TELEPHONE (216) 622-9800 - ILLUMINATING BLDG. — 55 PUBLIC SQUARE

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MURRAY R. EDELMAN
VICE PRESIDENT
NUCLEAR

November 12, 1984
PY-CEI/NRR-0130 L

DRAFT

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Perry Nuclear Power Plant
Docket Nos. 50-440; 50-441
Containment Design & Isolation
Test Provisions
(Questions 480.49-480.51)

Dear Mr. Youngblood:

This letter is provided to supplement our response dated January 31, 1984 (PY-CEI/NRR-0090L) which responded to your December 21, 1983 request for additional information concerning drywell purge containment leakage testing and containment isolation provisions. Our previous submittal provided responses to questions 480.50(b),(c), and 480.51. Responses to the remaining questions 480.49 and 480.50 (a) are attached.

In addition, Attachment 1 to this letter describes the revised containment bypass leakage limit including the radiological analysis with respect to control room and off-site doses. This increased design bypass leakage limit incorporates the results of our evaluation of the feedwater leakage control system to provide post-accident sealing of the feedwater line in the first hour of the postulated event. Finally, a summary is provided in attachment 2 of the changes that are reflected in the latest revision to the FSAR containment isolation tables 6.2-32 and 6.2-40 and Figure 6.2-60.

All of the responses to the questions and the revised containment leak rate will be reflected in a future FSAR amendment. Please call if you have any questions.

Very truly yours,

Murray R. Edelman
Vice President
Nuclear Group

MRE:njc

Attachments

cc: Jay Silberg, Esq.
John Stefano
J. Grobe

480.49 The FSAR does not identify the extent to which the drywell purging system will be used during operating modes 1 through 3. Therefore, provide the following information:

a. Discuss the manner by which small pressure variations in the drywell will be accommodated. Include in your response the anticipated transients which would cause the pressure surge, the pressure differential value which would trigger a pressure relief action and the system or portions of a system that will be used for pressure control.

b. Does CEI forsee personnel entry into the drywell during normal power operations (i.e., Mode 3)? If so, discuss the manner in which airborne activity would be reduced (ALARA) to accommodate plant personnel during drywell entry. If the drywell purge system would be used such that it is connected to the annulus exhaust gas treatment system (AEGTS), show that in the event of a LOCA the AEGTS equipment and line isolation valves will be able to withstand the effects of LOCA-related pressure transients. Also, show the effects on all plant transients if the purge system is being used at the onset of a LOCA.

Response

a. Reactor startup is the only anticipated transient that will result in a small pressure rise in the drywell. To relieve the pressure, we propose to open the drywell purge exhaust line and route drywell air through the containment and drywell purge exhaust filter trains out the plant vent. The proposed vent path is illustrated on the attached figure. We propose to open the purge valves in the vent path for no longer than five hours per year during modes 1, 2, and 3. After startup, after drywell temperature has stabilized, the valves will be sealed closed. The drywell purge supply lines will be sealed closed at all times during modes 1, 2, and 3. Operators will follow procedures to initiate pressure relief when drywell pressure reaches 1 psig.

Revise to address 2" & 36/42 as needed

b. CEI does not anticipate any routine entries into the drywell during modes 1, 2, and 3. Personnel may, however, need to enter the drywell to perform non-routine surveillances. If drywell access is required, the Health Physics Unit will consider special dosimetry requirements, respiratory protection requirements, and ALARA prior to personnel entry. The Drywell purge system will not be used to reduce drywell radioactivity during modes 1, 2, and 3.

480.50 With regard to CEI's containment leakage test program as presented in FSAR Table 6.2 - 40, provide a discussion on each of the following:

a. CEI has indicated that the feedwater leakage control system (FWLCS) would provide post-accident sealing of both feedwater lines, thus precluding the need to perform Type C leak tests of the feedwater isolation valves with air. The Perry FWLCS is similar, if not identical, to the Grand Gulf FWLCS. At this time, MP&L (Grand Gulf) has not demonstrated satisfactorily that drywell leakage does not exist through the feedwater isolation valves in the first hour of the postulated event (i.e., time manually activate FWLCS plus the time to fill the feedwater line). Therefore, the staff has required MP&L to Type C leak test these valves with air. Similarly, the staff will require CEI's feedwater isolation valves to be leak tested with air or demonstrate why these valves should not be tested with air.

Response

a. The FSAR Table 6.2-40 will be revised to note that the feedwater isolation check valves (B21-F032 A&B and N27-F559 A&B) will be Type C tested with air.

ATTACHMENT 2

SUMMARY OF CHANGES TO FSAR CONTAINMENT ISOLATION TABLES 6.2-32 AND 6.2-40 AND FIGURE 6.2-60

Addition of new containment isolation valves

Includes: Post Accident Sampling System isolation valves (P318/P422 & P423, P413/P124, P401/P401), Personnel Airlock Leakage Control System isolation valves (P305/P205, P312/P215), FWLCS test line isolation spectacle flange (P107/P109), and test connections for several penetrations.

Change from water to air test

Includes: Feedwater isolation check valves (P121/P112, P414/P410), RHR shutdown cooling suction isolation valves (P421/P406), RCIC and RHR to RPV head spray isolation valves (P123, P117). Also, the following valves will be tested with air because the lines they isolate were shortened in containment to an elevation above the suppression pool minimum drawdown level. The lines were shortened to solve hanger problems created by pool swell loads, the lines do, however, still terminate below the suppression pool normal water level: RCIC minimum flow line valves (P104/P107), HPCS minimum flow and test line valves (P409/P409), and RHR C loop minimum flow and test return line valves (P408/P405).

Note hydrostatic tests to be at not less than 1.10 Pd

Table 6.2-40 notes revised to explicitly state the hydrostatic test pressure requirement of Appendix J, item III.C.2.b (table 6.2-40 notes 6 and 9).

Note change to provide test flexibility

Table 6.2-40 note 3 revised to allow test personnel to test globe valves in either direction, provided Appendix J requirements are met.

Note change to document Personnel Airlock Leakage Control System (PALCS) closed system leak test exemption

A portion of the PALCS is designated a closed system. The piping, however, returns to the annulus. Since the annulus is kept at a negative pressure, all post-LOCA leakage flows to the annulus; a leak test is unnecessary.

Revision of closure times - Table 6.2-32

All fast-acting valve closure times (1 second or less) were changed to 3 seconds to facilitate Inservice Testing stroke time measurement. The change to 3 seconds will not affect the offsite dose analysis. This FSAR change does not alter design/procurement requirements; the change reflects acceptable performance requirements for testing.

E51 F063 closure time was changed from 10 seconds to Standard. Closure time is not critical since the valve is closed during any postulated pipe break event when containment isolation is necessary. Standard closure time was assigned to provide a guide for Inservice Testing personnel for indication of valve operator degradation.

Note 9 in table was revised to state standard closure times will be revised with results of pre-operational stroke time tests.

Lock-closed valves

Figure 6.2-60 was revised to show test connection containment isolation valves lock-closed in accordance with CEI's response to question 480.51.

Clarifications and corrections

Includes clarification of isolation configurations, additions of valves previously omitted, clarification of test requirements, and corrections of typographical errors.

Meeting Summary Distribution

DEC 0 6 1984

Docket File (50-440/441)
NRC PDR
Local PDR
PRC System
NSIC
LB #1 Reading File
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