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

January 27, 1984

Docket No. 50-289

MEMORANDUM FOR: Roger Mattson, Director, Division of Systems Integration

Richard Vollmer, Director, Division of Engineering

FROM: Darrell Eisenhut, Director, Division of Licensing

SUBJECT: UNION OF CONCERNED SCIENTISTS 2.206 PETITION ON TMI-1

Enclosed is a Union of Concerned Scientists petition requesting that the TMI-1 license be suspended unless and until certain modifications are performed on the emergency feedwater (EFW) system. We request that you review the petition and prepare appropriate Safety Evaluations as follows:

UCS Concern	Responsible Division
1. Environmental Qualification	DE/EQB
2. Seismic Qualification	~~DSI~~ ORAB
3. Single Failure Criteria	DSI/ASB
4. Flow Instruments	DSI/ICSB
5. Main Steam Line Rupture Detection System	DSI/CSB

Rubenstein

Houston

We request that you provide the Safety Evaluations by no later than March 9, 1984. We expect to have the licensee's response to the petition by February 22, 1984, and will provide it to you upon receipt.

for Darrell Eisenhut, Director
Division of Licensing

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TELLIGENCER JOURNAL, Lancaster, Pa., Tuesday, January 31, 1984

Suit Eyed To Stop Restart Of TMI-1

By Leslie R. Klein
Intelligencer Journal Staff

The Union of Concerned Scientists will sue the Nuclear Regulatory Commission if the NRC doesn't require certain equipment safety changes at Three Mile Island's Unit 1 before restart, a UCS engineer said Monday night.

"We'll take the NRC to court on the grounds they are violating their mandate to ensure the safety of the public," Robert D. Pollard, a UCS nuclear safety engineer, said at a press conference at the Friends Meeting House in Lancaster.

After the March 1979 accident at Unit 2, the NRC ordered equipment improvements at TMI and other plants designed by Babcock and Wilcox.

"A large number of the modifications are not yet implemented," Pollard said.

One of changes was upgrading the emergency feedwater system, which delivers cooling water to the steam generators.

GPU Nuclear Corp. wants to delay the change until the first shutdown for refueling at Unit 1 after restart, he said.

UCS filed a "show-cause" petition with the NRC on Jan. 20.

It asks the NRC to explain why the emergency feedwater system shouldn't be modified to meet NRC requirements before restart.

It insists that the NRC reply "within a reasonable time, which we interpret to mean prior to restart," Pollard said.

If the NRC doesn't respond before restart or if UCS isn't satisfied with the answer, UCS will go to court.

UCS will use the same tactics for each hardware safety issue, Pollard said.

GPU would probably become a party in the court suits, he added.

UCS is a non-profit coalition of engineers, scientists and other professionals. Pollard was a project manager at the NRC for six years.

He is now inspecting Unit 1 equipment changes with an NRC team. NRC attorneys asked that Pollard go along since the inspection results will probably figure into the agency's restart decision.

ROBERT POLLARD
Nuke safety engineer

The NRC team will also visit all other Babcock and Wilcox plants.

On other TMI issues, Pollard said he believes the NRC has too many restart issues to consider to be able to rule on restart by the June deadline it proposed last week.

But he thinks the agency will eventually vote for restart.

He criticized the NRC's decision last week not to wait for the results of several investigations of GPU's management and the Metropolitan Edison trial on leak rate falsification before it votes on restart.

"I don't think you can really separate the management issues from the design questions," he said.

And he argued that the state Department of Environmental Resources has been "one of the primary hurdles in achieving a safe plant." He said DER has dropped its insistence on several safety standards.

Pollard divided the equipment changes into three groups:

- Modifications, such as those in the emergency feedwater system, that grew directly out of the lessons learned from the accident.
- Safety changes suggested by problems at other plants.

For example, the NRC required that fire protection changes be made by 1981 after a fire in 1975 at the Brown's Ferry plant in Alabama. The agency said the changes should be made at the first shutdown for refueling or the first outage longer than 120

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days.

But the NRC has said GPU can wait until the first refueling after restart since the outage at Unit 1 happened before 1981, Pollard said.

This is a "good example" of the NRC "turning its rules on end" even though it knows certain improvements are "necessary," he said. He blamed the NRC's attitude partly on its close relationship with the nuclear industry.

- Changes that UCS says need to be made in NRC safety requirements. The NRC has said it will not consider these modifications for the Unit 1 plant.

Pollard said this category includes a revised hydrogen explosion control system and safety equipment that can withstand the heat and other conditions of an accident.

Pollard said that in the 1979 accident 35 to 50 percent of the zirconium in the reactor combined with water to produce hydrogen. The NRC is requiring that the system handle only a 5 percent combination.

In 1979, the NRC had required GPU to show "reasonable progress" toward completing the changes before the plant would restart. At that time, Unit 1 was expected to go back on line in 1980 or 81.

"The plant has been shut down five years. They could have gone in and done those changes any time but they haven't. That's not reasonable progress," he said.

GPU now wants to do certain changes during the first refueling because restart would have to be delayed if the changes were done beforehand, Pollard said.

Earlier on Monday, Doug Bedell, a GPU Nuclear spokesman, said the company has "implemented and completed what the NRC asked us to complete on schedule ..."

Instruments giving operators a better picture of water levels in the plant's main cooling system won't be installed until the Fall of this year, Bedell said.

But another device, a saturation meter, is already installed and helps operators keep track of water levels, he added.

High point vents have been installed in piping on the primary cooling system but vents inside the reactor head won't be installed until the Fall, Bedell said.

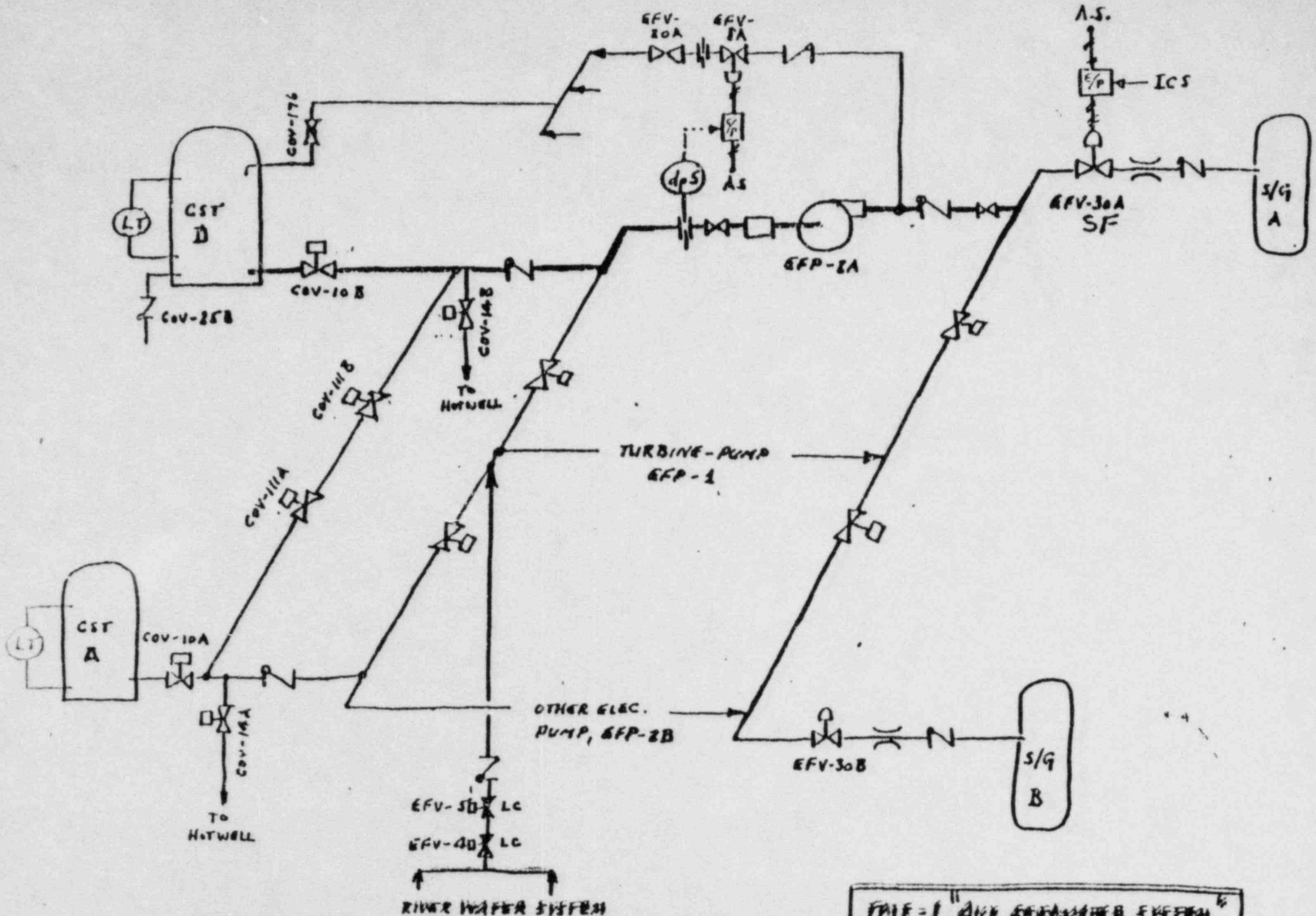
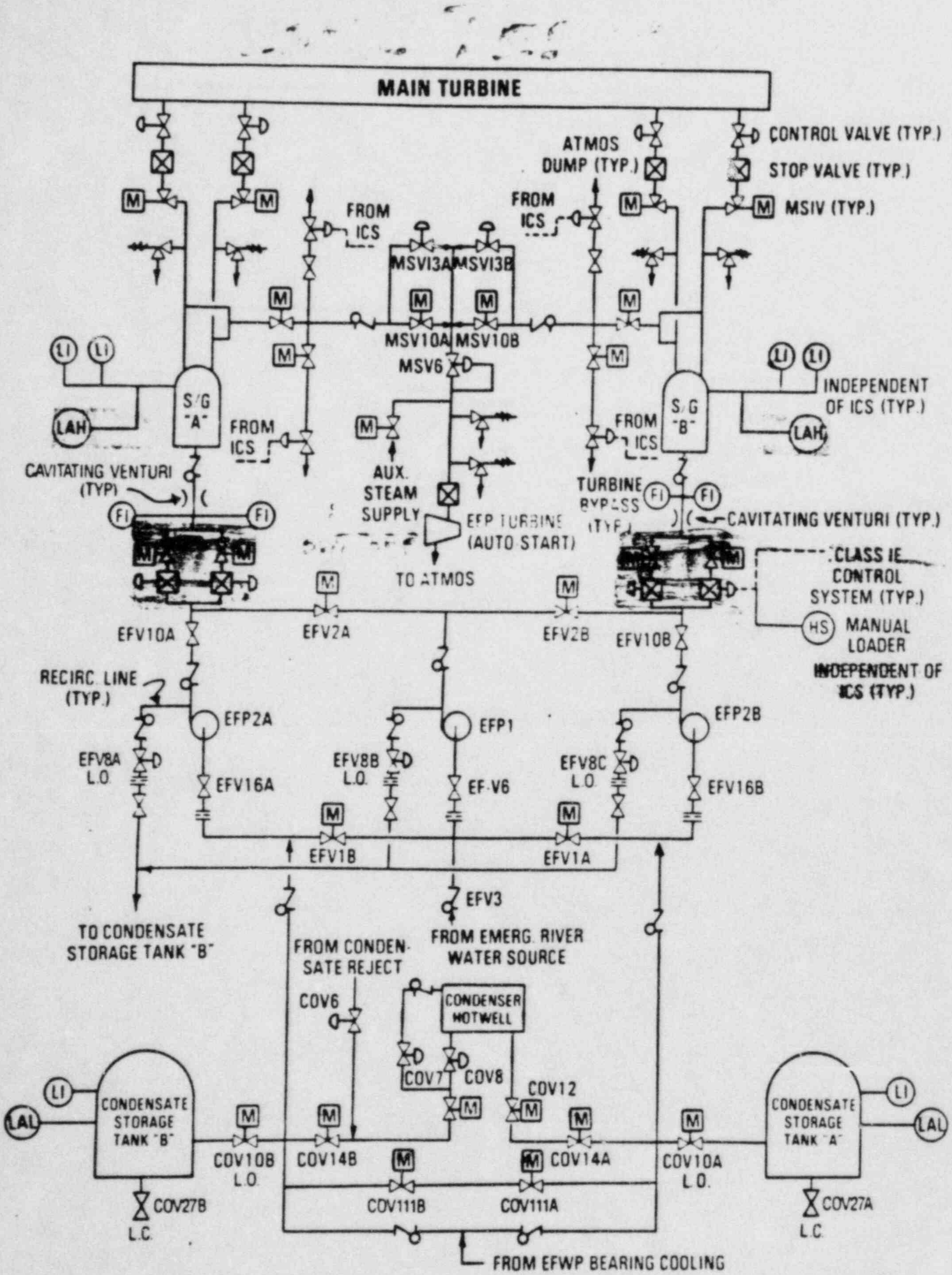
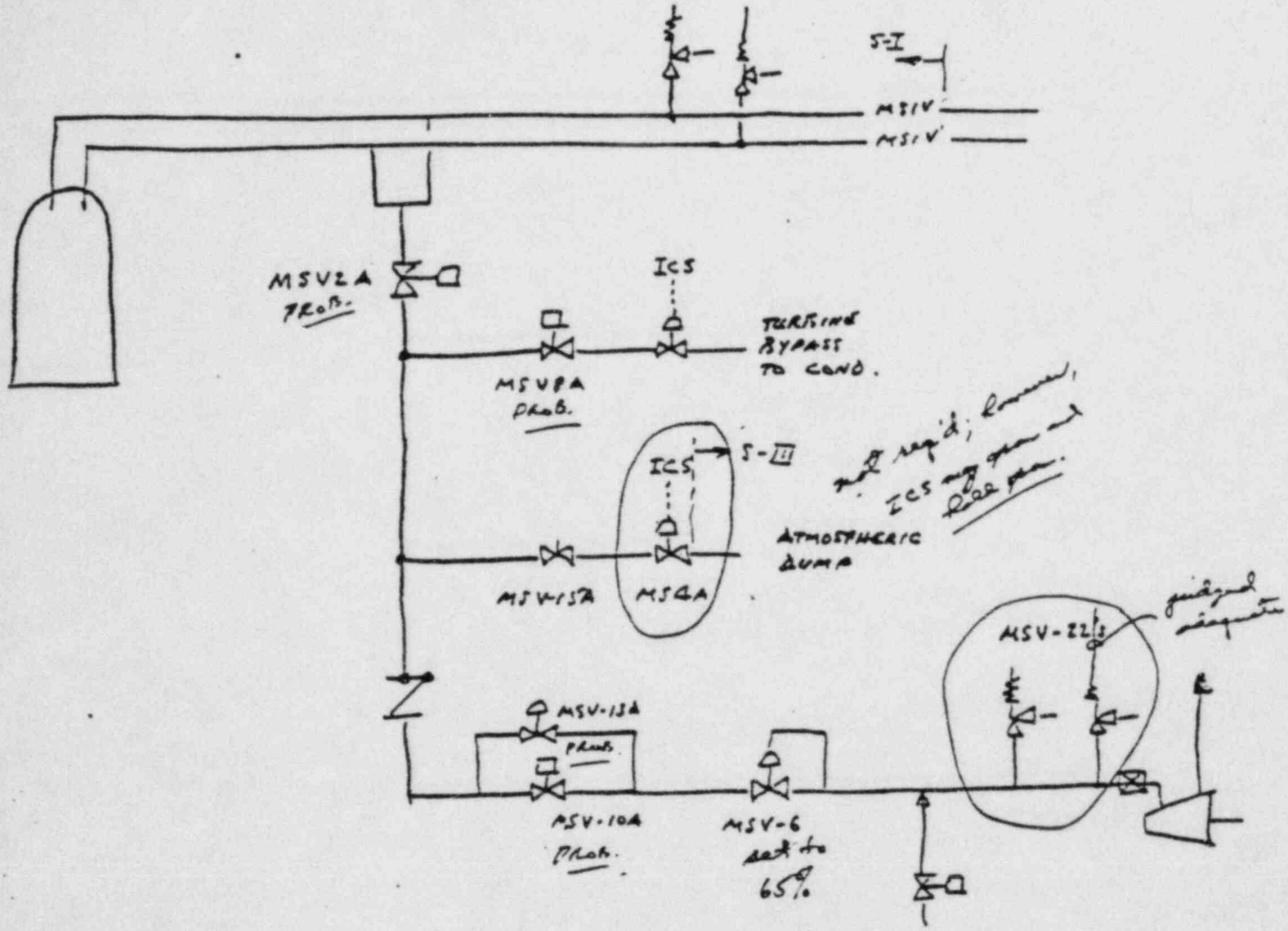


FIG. 1 "AUX FEEDWATER SYSTEM"
J.F. BEARS 12/29/82



(FIG. 3) TMI-1 EFW SYSTEM LONG TERM MODIFICATION



1. prob. of valve (MSV-6 or -22) opening.

2. prob. of vent stack failing

3. prob. of re-closing valve (terminating blow down)

4. dissipation of escaped steam.

GPU Nuclear

TECHNICAL DATA REPORT

TDR NO. 250	REVISION NO. 1
BUDGET ACTIVITY NO. 0015A	PAGE 1 OF 11
PROJECT: TMI-1	DEPARTMENT/SECTION Engineering & Design/ Mechanical Systems
	RELEASE DATE 4/3/81 REVISION DATE 1/9/84

DOCUMENT TITLE: Review of Intermediate Building Flooding Following a Feedwater Line Break in the intermediate building of TMI Unit 1.

ORIGINATOR SIGNATURE	DATE	APPROVAL(S) SIGNATURE	DATE
S Y Ku	1-12-84	T. M. Dempsey	1-12-84
		MO Sanford	1-16-84
		APPROVAL FOR EXTERNAL DISTRIBUTION	DATE
		DK Croneberger	1-16-84

Does this TDR include recommendation(s)? ☒Yes ☐No If yes, TFWR/TR # SDD-424B

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DRF 12096

ABSTRACT:

I. Brief Statement of Problem:

A review of postulated feedwater pipe breaks in the intermediate building has indicated that the plant design has left the problem of building flooding as a result of a postulated main feedwater line break unresolved. The original FSAR has been revised to address the flooding problem in the intermediate building following a feedwater line break. Since the intermediate building houses the emergency feedwater (EFW) pumps, instrument air compressors, hydrogen recombiner control panel and reactor building emergency cooler leak detection panel at floor EL. 295'- 0", flooding due to a postulated feedwater pipe break is an important consideration for safe shut down.

The purpose of this TDR is to address this problem and provide recommendations for a resolution.

II. Summary of Key Results

Based on the present plant configuration, it will take approximately 3.9 minutes before water reaches the intermediate building floor level in case of a feedwater line break in the intermediate building.

The alligator pit which surrounds two-thirds of the Reactor Building is divided into three distinct zones. The first zone is from door A15 to the eastern water stop wall. The second zone

GPU Nuclear

DOCUMENT NO. TDR-250

TITLE: Review of Intermediate Building Flooding Following a Feedwater Line Break in the Intermediate Building of TMI Unit 1

REV	SUMMARY OF CHANGE	APPROVAL	DATE
1	Revised Section II of cover sheet as a result of the removal of the top half of the eastern water stopwall per GPUN SECM-187. The cover sheet of the TDR-250 Revision 0 is available in ED & CC. Revised Section 2.0 to reflect the change of time required to fill alligator pit and/or tendon access gallery as a result of the modification per SECM-187 and the use of correct feedwater flow rate. Revised Section 3.0 to address the safety concern on the hypothetical aircraft accident, fire hazards and feedwater line break flooding of Intermediate & Auxiliary Buildings as a result of PEDR meeting on January 24, 1983. Revised Section 4.0 as a result of PEDR meeting on October 19, 1983. Added Sections 5.5, 5.6, 5.7, 5.8, 5.9 to provide additional references. Added Figures 3 & 4 to show feedwater line break flow rate vs time and feedwater line break water level vs time respectively.	SYK TMD.	1-12-84 1-13-84

is between the two water-stop walls which includes the hardened portion of the Intermediate Building. The third zone is from the western water stop wall to door A1. Presently the top half of the eastern water stop wall was removed per GPUN SECM-187 to accommodate routing of nuclear safety-related conduits for the post accident H_2 Monitor Cable, Post Accident H_2 Recombiner Cable, and Emergency Feedwater Flow Indication Cable.

If the alligator pit and the tendon access gallery are allowed to be flooded by removing the upper half of the western water "stop wall" in the alligator pit and entrance "A" and "B" from the alligator pit to tendon access gallery, the time required for water to appreciably flood the intermediate building is approximately 25 minutes.

The volumes of the alligator pit and the tendon gallery combined can accomodate the available water sources from the hot well, heater drain tank, feedwater heaters, piping and about 40% of the condensate storage tank "B" which provides the makeup to the condenser.

III. Conclusions

Modifications are required in the plant design to mitigate the effects of flooding due to the postulated feedwater line break in the intermediate building by allowing water to flow into the tendon access gallery and portions of alligator pit which are presently isolated. Also, a detection system should be provided to alert the operator that a significant amount of water has collected in the alligator pit and the tendon access gallery which may be the result of a feedwater line break in the intermediate building and which he may then terminate with non-safety grade equipment. The electrical cables routed thru the alligator pit and their penetrations thru the alligator pit walls need to be evaluated for their capability to perform their function after they are flooded.

TABLE OF CONTENTS

Title: Review of the Intermediate Building Flooding Following Feedwater Line Break for TMI-1

1.0 Purpose and Summary

The purpose of this TDR is to address the problem of flooding due to a postulated feedwater pipe break in the intermediate building. The main feedwater line supplying feedwater to steam generator 'B' passes thru the intermediate building. This line requires high energy pipe break analysis and its effects. Since equipment important to safety, such as emergency feedwater (EFW) pumps, instrument air compressors, hydrogen recombiner control panel and the reactor building emergency cooler leak detection panel are located at floor elevation 295' in the intermediate building the resulting flooding problem due to a postulated pipe break has to be resolved.

This TDR summarizes the studies made related to this subject and recommends a solution to mitigate intermediate building flooding due to a feedwater line break.

2.0 Methods:

This analysis uses parts of "Analysis of Intermediate Building Flooding Following Feedwater Line Break" by Nuclear Services Corporation (NSC) (Ref. 1).

(a) Time to fill the alligator pit in the intermediate building area (assuming the western water "stop wall" in the alligator pit and doors on EL. 279' from the alligator pit down to the tendon access gallery are left closed), with the present plant configuration in case of a feedwater line break in the intermediate building:

Alligator pit volume = $8260\ ft^3 \times 2 = 16520\ ft^3$

From NSC report, Initial F.W. flow rate after a line break = 8200 lbs/sec. or $131.4\ ft^3/sec$.

After 40 sec. FW pump flow rate = 6700 lbs/sec. = $107.3\ ft^3/sec$.

Steady rate at 75 sec. FW pump flow rate = 3500 lbs/sec. = $56.0\ ft^3/sec$.

Feedwater flow continues at this steady state rate until the hotwell starts to empty at 530 seconds. When the hotwell is empty, water will continue to flow from the condensate storage tank COT-1B to the break at an average rate of 675 lbs/sec until condensate storage tank COT-1B is empty, approximately 54 minutes after the break. The feedwater break flow vs. time is shown in Fig. 3.

Steady rate after 530 sec. FW flow rate = 675 lbs/sec.
= 10.82 ft^3/sec.

Volume pumped in first 40 sec. $= \frac{(131.4 + 107.3)}{2} \times 40$
$= 4774\ ft^3$

Volume pumped in next 35 sec. $= \frac{(107.3 + 56)}{2} \times 35$
$2858\ ft^3$

Volume pumped between 75 sec. and 530 sec.
$= 56 \times (530 - 75) = 25{,}480\ ft^3$

Fluid (cold water) released in first 75 sec. = 4774 + 2858 = 7632 ft. 3

Fluid released in the first 530 sec. = 4774 + 2858 + 25,480
$= 33{,}112\ ft^3$

Time required to fill the available volume of the alligator pit

$$= 75 + \frac{(16520-7632)\ ft^3}{56\ ft^3/sec}$$
$= 75 + 158.7$
$= 233.7$ sec. (approx.)
$=$ 3.9 minutes

The feedwater line break water level vs. time is shown in curve A of Fig. 4.

This is too short a time for an operator to respond and take action to avoid intermediate building floor flooding.

(b) Time to fill the complete alligator pit and tendon access gallery (assuming upper half of the western water "stop wall" in alligator pit and door on EL. 279' entrance "A" completely removed) in case of feedwater line break in the intermediate building:

Alligator pit volume (total) = 24,780 ft^3
Tendon Access Gallery volume = 12,400 ft^3
Available total volume = 37,180 ft^3

Volumes of water available from condensate, feedwater and heater drain systems:

Volume of water in the Hotwell = 22,058 ft^3
Volume of water in the Heater Drain tank = 842 ft^3
Volume of FW piping and FW heaters = 1,500 ft^3
(Capable of draining thru the break) 24,400 ft^3

Therefore, the volumes of the alligator pit and the tendon gallery combined can accommodate the available water sources from the hotwell, heater drain tank, feedwater heaters, piping and about 40% of the condensate storage tank "B."

Thus, time to fill both the alligator pit and the tendon access gallery would be:

$$= 530 + \frac{(37,180 - 33,112)ft^3}{10.82\ ft^3/sec} = 530 + 376 = 906\ sec. = 15.1\ min.$$

All Emergency Feedwater equipment is located above the basement floor level (EL. 295'). Flood water would have to be at a level of 13-7/8" above the floor before it made contact with any EFW active component that could be adversely affected by the flood water. Since the area of Intermediate Building basement floor is approximately 5500 ft^2, the total volume with a flood level of 13 7/8" above the basement floor is equal to $5500 \times \frac{13\ 7/8}{12} = 6,359\ ft^3$

Therefore, time required to jeopardize the EFW active components by the flood water would be:

$$906\ sec. + \frac{6359}{10.82}\ sec. = 906\ sec. + 588\ sec. = 1,494\ sec. = 25\ min.\ (approx.)$$

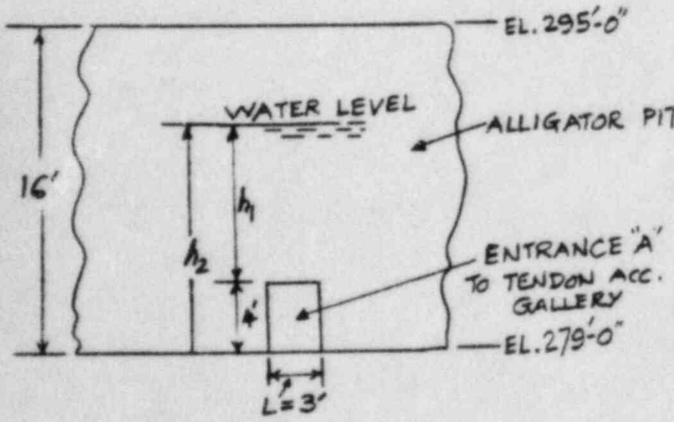
The feedwater line break water level vs. time is shown in curve C of Fig. 4.

This would provide sufficient time for an operator to respond and take action before any active components in the Emergency Feedwater system are jeopardized.

(c) Calculation of flow rate of water from alligator pit thru entrance "A" of tendon access gallery:

Clear Opening of entrance = 3'x4'

Using rectangular orifice formula,



$$Q = 2/3\ L \sqrt{2g}\ (h_2^{3/2} - h_1^{3/2})$$

(Equation 4-16, Hydraulics Handbook, Brater & King)

Q = Flow rate, ft^3/sec.

L = Width of orifice, ft

h_2 = Height of water level from the bottom of the orifice

h_1 = Height of water level from the top of the orifice

g = Gravity constant

I. Assuming water level at the top of the opening,

$$Q = \frac{2}{3} \times 3 \sqrt{2x32.2}\ (4^{3/2} - 0)$$

$$= 128.4\ ft^3/sec.$$

II. Assuming water level at the top of the alligator pit,

$$Q = \frac{2}{3} \times 3\sqrt{2\times32.2}\ (16^{3/2} - 12^{3/2})$$
$$= 360.2\ ft^3/sec.$$

Comparing these rates with maximum feed water rates in case of pipe break (131.4 ft^3/sec for first 40 sec., 107.3 ft^3/sec for next 35 sec., and 56 ft^3/sec at 75 sec.), it is concluded that entrance area is adequate for water to flow to the tendon access gallery.

3.0 Evaluation

Item 15 of the Atomic Energy Commission document titled "General Information Required for Consideration of the Effects of a Piping System Break Outside Containment" (Ref. 2) requires that a discussion should be provided for the potential for flooding of safety related equipment in the event of failure of a feed water line or any other line carrying high energy fluid. Gilbert Associates, Incorporated (GAI) investigated this subject and prepared a draft "Response to the AEC 21 Questions" (Ref. 3) with a reference to an analysis prepared by Nuclear Services Corporation (GIL-03-09) (Ref. 1). This report was never formalized nor was it followed up or its recommendations implemented in the plant design as far as building flooding is concerned.

The FSAR statement in Supplement 2, part IX Am. 41 that "the auxiliary area can not be flooded by a break in the intermediate or turbine building because the water from these breaks will drain to the turbine pit and ultimately out of the building" is in conflict with actual plant design. No such flow path exists at elevation 295 ft. It can be assumed that the term intermediate building was applied to the steel structure portion of the intermediate building which is located on the east side of the reactor building adjacent to the turbine building.

An evaluation was made for different alternatives available in order to mitigate flooding in the intermediate building in case of a postulated feed water line break (Ref. 4, 5, 6, & 7).

Opening up the west side water "stop wall" in the alligator pit shown on GAI dwg. E-421-301 and doors on EL. 279' from the alligator pit down to the tendon access gallery shown on GAI dwg. E-422-045 will allow more time before there is significant flooding in the intermediate building. Based on the feed water flow rates anticipated after break from NSC report, opening of the water "stop walls" and entrance "A" door on EL. 279' from the alligator pit down to the tendon access gallery will allow approximately 15 minutes to fill the tendon access gallery and alligator pit. Without removing these walls with the present plant configuration the available time will be approximately 3.9 minutes after the break for water to reach intermediate building floor el. 295'. Alarms can be installed at suitable locations in the north quadrant of the alligator pit to warn the operator of a flooding event. In order to increase the drainage sink by opening the upper half of the water "stop wall" on the west side and tendon access gallery entrance will require that the alligator pit drains to reactor building gallery sump (shown on GAI dwgs. C-302-719 and E-311-813, detail 5) be blocked by control valve WDL-529 so that flooding of the alligator pit will not affect the auxiliary building area. The floor drains in the tendon access gallery under normal circumstances drain to the miscellaneous waste storage tank. There is a valve, WDL-V500, that could route the drains to the mechanical draft cooling tower effluent. However, since RML8 was removed several years ago, this path is not currently permitted for use. Also any other opening from tendon access gallery and alligator pit into auxiliary or turbine building needs to be blocked to prevent water passing into or out of these areas.

In opening the west side water "stop wall" in the alligator pit and the doors on EL. 279' from the alligator pit down to the tendon access gallery, consideration must be given to the entry of aircraft fuel under the postulated aircraft impact incidence at either the east side or the west side of the Reactor Building. The roof of the alligator pit is at Elev. 305'-0" except within the confines of the hardened portion of the Intermediate Building. This roof is exposed to potential aircraft impact on the east and west sides of the Reactor Building. The aircraft could impact the alligator pit roof on the east side of the Reactor Building by passing thru the Seismic Class III designed Intermediate Building. On the west side of the Reactor Building, the alligator pit roof could be struck by an aircraft between the Intermediate Building and the Auxiliary Building except in the area near the equipment access hatch missile shield. The probability of the full design basis aircraft impacting on these limited areas was considered low. Therefore, the alligator pit roof was designed to withstand the impact of a 6,000 lb. aircraft fragment traveling at 200 mph per FSAR Appendix 5A. In addition, the alligator pit retaining wall and roof structure were qualified to ensure the ability to resist the plant seismic loadings. The 10 inch slab at tendon access gallery entrance "C" on the west side of the Reactor Building in which there should be a watertight manhole cover was not designed to withstand any type of aircraft fragment impact. Burning aircraft fuel could enter the tendon access gallery or alligator pit through the external tendon access gallery manhole at entrance "C". The burning aircraft fuel could impact the Intermediate Building's safe shutdown equipment in fire zones IB-FZ-1, IB-FZ-2, IB-FZ-3, and IB-FZ-4 (Ref. 8). In addition, in the east sector of the alligator pit, there exists both green and red NSR conduit banks. These NSR conduits for the Post Accident H_2 Monitor cable, Post Accident H_2 Recombiner Cable, and

Emergency Feedwater Flow Indication Cable would also be subjected to the burning fuel. To preclude the entry of any aircraft fuel into the alligator pit, the joint between the alligator pit roof slab and the reactor building and the manhole cover plate for entrance "C" to the tendon gallery at the west side of the reactor building must be appropriately sealed from both natural phenomenon water and aircraft fuel.

In addition, GAI recommends the following changes (Ref. 5 & 6) to lengthen the time required to flood the Intermediate Building from a main feedwater line break and yet eliminate the major safety concerns regarding burning aircraft fuel in the Intermediate Building:

1. A sealed bulkhead door should be installed in the physical doorway opening to the tendon access gallery at Elev. 262'-9 1/4" of tendon access gallery entrance "C". The entire existing door from the alligator pit to the tendon access gallery entrance "C" at EL. 279' must remain in place. Both of these doors must be capable of resisting external flood hydrostatic pressure and internal compartment pressurization. Both of these doors should also be qualified for fire. This would eliminate burning aircraft fuel from entering the common Intermediate Building, alligator pit, and tendon access gallery fire zone, thereby eliminating the fire safety concern.

2. The sealed bulkhead door at tendon access gallery entrance "B" should be partially or entirely removed in order to release displaced air from the tendon access gallery as water enters at entrance "A". In addition, this opened doorway would also provide an additional means for water to enter the tendon access gallery.

The existing door A1 to the alligator pit on the south side is anchored with only five (5) 1/2" diameter Hohmann and Barnard #HD inserts and thirty-one (31) 1/2" diameter cinch anchors manufactured by the National Lead Company. The cinch anchors contain two lead composition female parts. These two lead rings, under the sustained floodwater pressure, combined with the initial pre-stressing force in the anchor, may under go sufficient creep to result in an uncontrolled leakage. Therefore, additional thirty-six (36) Liebig Anchors should be installed in between the existing cinch anchors on the door A1 to assure sealing of the door against the postulated feedwater pressure from the alligator pit side (Ref. 7).

To provide operator with control room alarm that identifies a feed water line break, the following two detections shall be provided:

1) Level float in alligator pit.
2) Low, low level in condenser hotwell, which already exists

On receipt of both alarms, the operator would trip condensate, condensate booster and feed water pumps. In addition to serving as an input to the "F.W. Rupture" alarm, the level float in the alligator pit will alarm independently in the control room to signal minor flooding from any source in the Intermediate Building for operator investigation and corrective action.

4.0 Recommendations

Following modifications shall be made to mitigate effects of flooding due to feed water pipe rupture in the intermediate building.

1. Remove the entire sealed door at the northeast entrance "A" on EL. 279' from the alligator pit to the tendon access gallery. (GAI Dwg. E-422-045)

2. Remove the entire portion of the sealed door at the entrance "B" on EL. 279' from the alligator pit to the tendon gallery (GAI Dwg. E-422-045)

3. Remove the upper half of the western water "stop wall" in the alligator pit. (GAI Dwg. E-421-301)

4. Upgrade the man-hole cover on the external access to the tendon access gallery at the west side of the Reactor Building to be water tight for flood conditions. (GAI Dwg. E-421-002)

5. Install additional thirty-six (36) Liebig Anchors in between the existing cinch anchors on the doors A1 to the alligator pit on the south side to assure sealing of the door.

6. Install a sealed bulkhead door in the physical doorway opening to the tendon access gallery at Elev. 262' 9 1/4" of tendon access gallery entrance "C". The entire existing door from the alligator pit to the tendon access gallery entrance "C" at EL. 279' must remain in place. Both of these doors should be capable of resisting external flood hydrostatic pressure and internal compartment pressurization. Both of these doors should also have the capability to prevent the passage of fire into the alligator pit and the tendon access gallery.

7. Provide the following two detections to provide operator with a control room alarm, indicating feedwater line break.

   (a) Level float in alligator pit
   (b) Low, low level in condenser hotwell (this already exists)

8. Control valve (WDL-V529) in 4" drain line from alligator pit drains to Spent Fuel Pit Room Sump shall be closed.

9. Tendon Access Gallery sump discharge to be put under administrative control to avoid accidental flow of flooded tendon gallery to the Miscellaneous Waste Storage Tank.

10. The electrical penetrations thru the two south walls of the alligator pit from and to the auxiliary and fuel handling buildings need to be evaluated for their sealing properties for a flooded alligator pit. The seismic gap fire seals on wall between alligator pit and Fuel Handling Building also need to be evaluated for their sealing properties for a flooded alligator pit.

11. The electrical power and control cables that are routed thru the alligator pit need to be evaluated in terms of being able to perform their safety function after a feedwater line break incident and resulting alligator pit flooding.

5.0 <u>References</u>

1. Nuclear Services Corporation Report GIL-03-09 "Analysis of Intermediate Building Flooding Following Feedwater Line Break," May 23, 1973.

2. Atomic Energy Commission (AEC) Request, "General Information Required for Consideration of Effects of Piping System Break Outside Containment," December 15, 1972.

3. Gilbert Associates Incorporated draft "Response to the AEC 21 Questions."

4. Gilbert Associates, Inc. memo GAI/TMI-1CS/4183, dated 12/26/80 from D. D. Krause, to D. G. Slear.

5. Gilbert Associates, Inc. letter GAI/TMI-1-ICS/9551 dated September 2, 1983 from R. R. Brems to J. W. Langenbach.

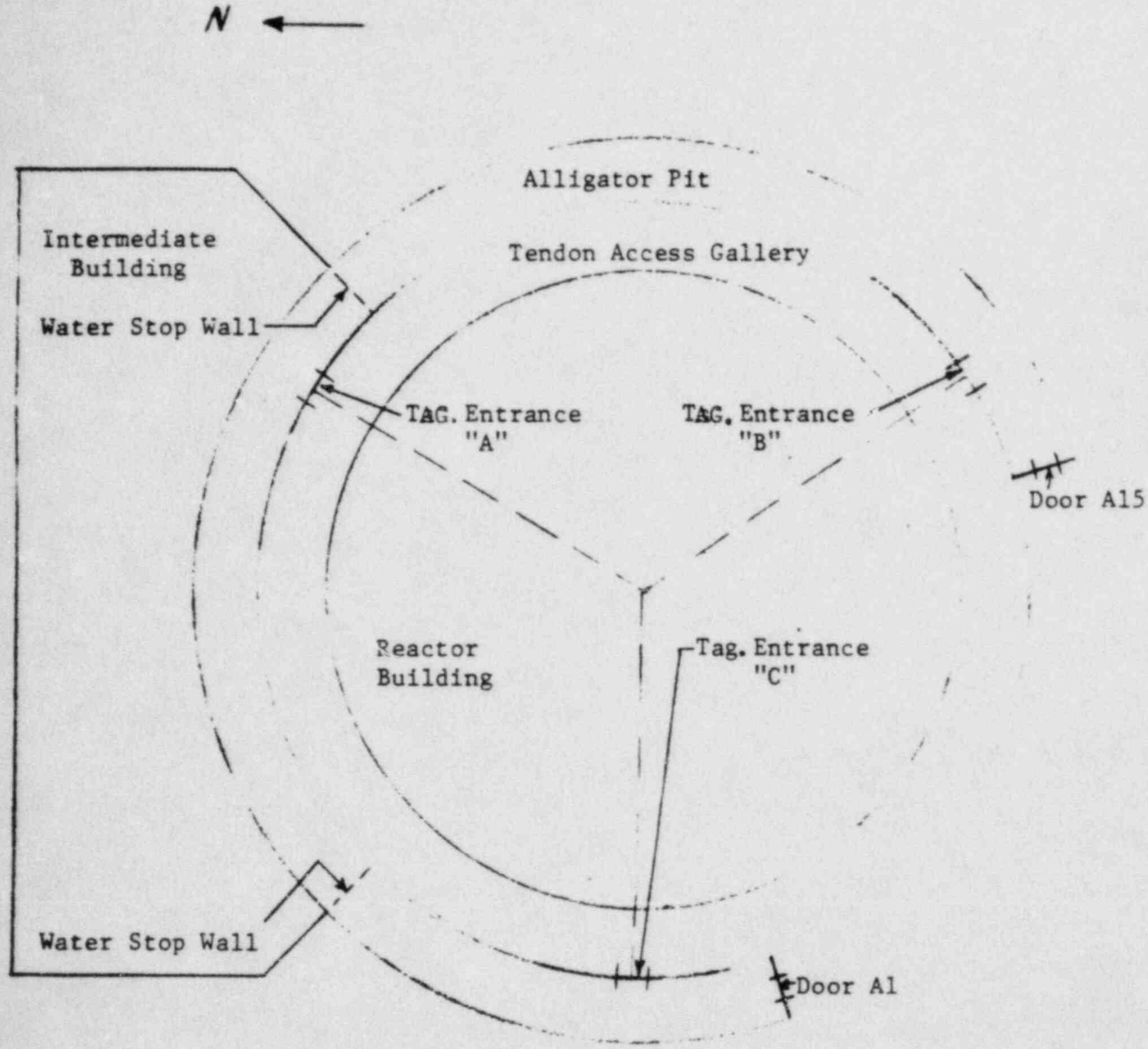
6. Gilbert Associates, Inc. letter GAI/TMI-1-ICS/9650 dated September 23, 1983 from R. R. Brems to J. W. Langenbach.

7. GPUNC memo EM-83-922/04091-26 dated November 21, 1983 from L. Garibian to R. Evers.

8. TMI-1 Fire Hazards Analysis Report and Appendix R Section III G Safe Shutdown Evaluation dated June 28, 1982.

9. GPUNC SECM-187 Rev. 0 "New Wall Openings for Cable Routing."

10. FSAR Update Chapt 14 Pg A & 11



TAG. = TENDON ACCESS GALLERY

FIGURE 1: FLOOD AREAS FOR POSTULATED FEEDWATER LINE BREAK IN THE INTERMEDIATE BUILDING

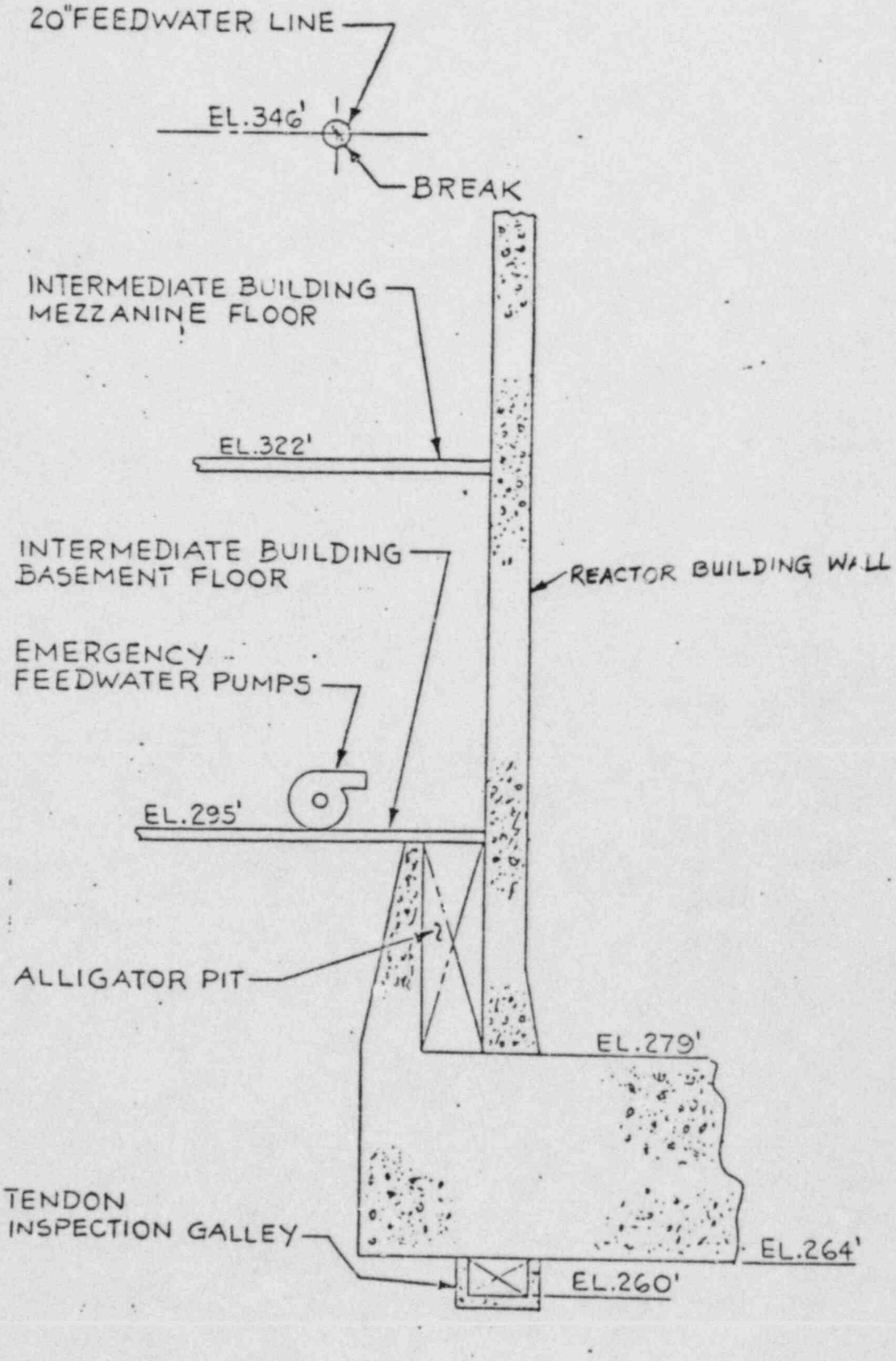


FIGURE 2: INTERMEDIATE BUILDING FLOOR AREAS

THREE MILE ISLAND FEEDWATER
BREAK FLOW VS. TIME

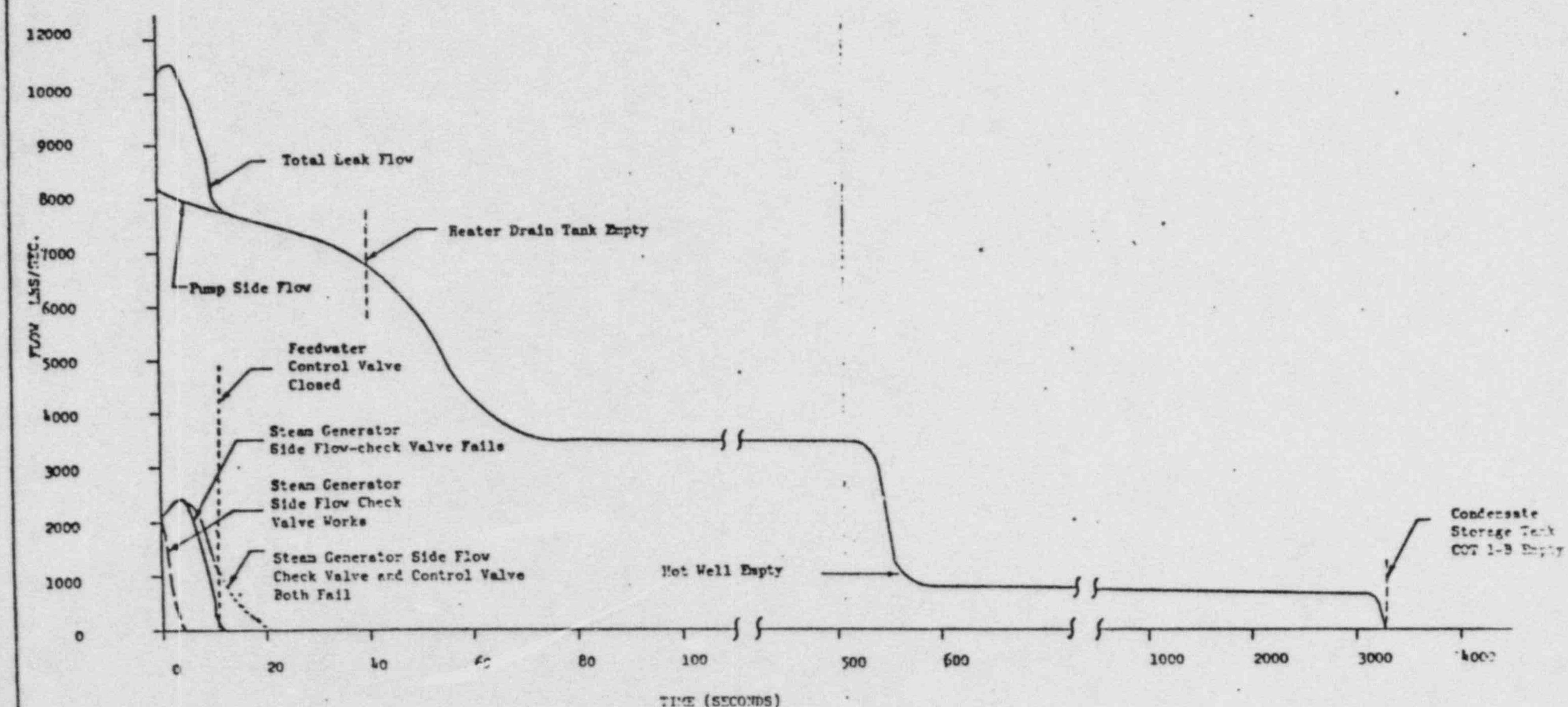
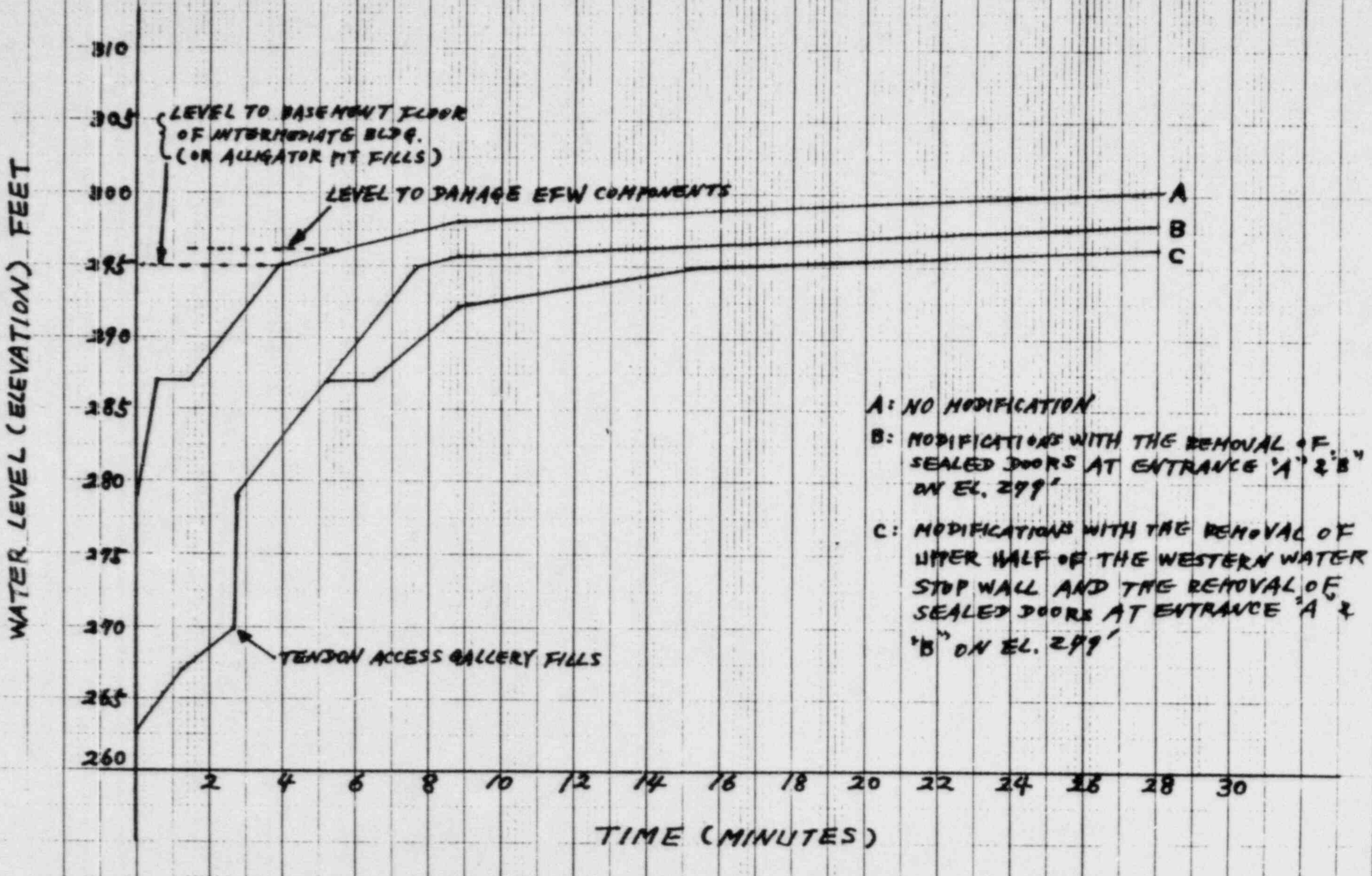


FIG-3



FEEDWATER LINE BREAK WATER LEVEL VS. TIME

FIG 4

NRC FORM 197 (10-81)

U.S. NUCLEAR REGULATORY COMMISSION

TECHNICAL ASSIGNMENT CONTROL FORM

TACS NUMBER: 53511

[X] NEW ASSIGNMENT [ ] NEW INFORMATION

SECTION I. REQUEST DATA

PREPARED BY: James Van Vliet	(AD) DATE PREPARED*: MO DAY YR 1 25 84
(AE, AF) FACILITY NAME AND ASSIGNMENT TITLE (Limit to 120 characters)*: Three Mile Island 1 - UCS 2.206 Petition	(AZ) PLANNED ACCOMPLISHMENT NUMBER*: 1111
(AG) REQUEST CONTACT*: Van Vliet; (AX) REQUESTER'S INITIALS: JBV; (AB) REQUESTING ORGANIZATION*: DL/ORB4	(AH) REQUESTING TARGET DATE: MO DAY YR
(AJ/AK) REQUESTING REMARKS (Limit to 120 characters):	(AL) MULTI PLANT ACTION NUMBER:

SECTION II. SYSTEMS CONTROL DATA

A. OPERATING REACTOR ACTIONS

PRIORITY: 1 [X] 2 [ ] 3 [ ] [ ]

(BA) DOCKET*: 50-289

(AR) INITIATION DATE*: MO. DAY YR. 1 25 84

(AV) AMENDMENT FEE CLASS*: N/A [X] I [ ] II [ ] III [ ] IV [ ] V [ ] VI [ ]

B. TOPICAL REPORT REVIEWS

VENDOR'S NAME:

REPORT IDENTIFICATION SYMBOL

(DA) PROPRIETARY (P)

(AR) REPORT DATE: MO. DAY YR.

(AS) ADDITIONAL INFORMATION REQUEST DATE: MO. DAY YR.

(EA) NON-PROPRIETARY VERSION (NP)

(AT) SUBMIT DATE: MO. DAY YR.

(AU) LETTER TO VENDOR DATE: MO. DAY YR.

(AV) ACCEPTED [ ] NOT ACCEPTED [ ] WITHDRAWN [ ]

(FA) NON-PROPRIETARY REPORT

SECTION III. REVIEW DATA

REVIEWER'S SURNAME	(CA) REVIEWER'S INITIALS*	(CB) ESTIMATED HOURS	COMPLETION DATE (CC) ESTIMATED MO. DAY YR.	COMPLETION DATE (CD) ACTUAL MO. DAY YR.
Van Vliet	JBV			

NRC FORM 197