



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

February 20, 1997

APPLICANT: Westinghouse Electric Corporation
PROJECT: AP600
SUBJECT: SUMMARY OF AP600 MEETING ON PROPOSED DESIGN CHANGES RELATED TO POST-72 HOUR ACTIONS

The subject meeting was held on February 4, 1997, in the Nuclear Regulatory Commission (NRC) Rockville, Maryland, offices between representatives of Westinghouse and the NRC staff. The purpose of the meeting was for Westinghouse to present proposed AP600 design changes in response to the NRC policy position in SECY-96-128 on post-72 hour actions. The Westinghouse goal was to obtain feedback from the staff on the acceptability of the proposed changes.

The changes proposed by Westinghouse include increasing the size of the passive containment cooling system (PCS) to provide additional makeup water supply to the spent fuel pool and up to 7 days of sustained cooling water to the containment shell. The spent fuel pool makeup water supply will be supplemented to include seismic connections from the PCS tank and from the cask washdown pit to ensure at least a 7 day supply of makeup water to replace spent fuel pool boiloff under worst case spent fuel pool heat load conditions. Cross-connections between the spent fuel pool cooling system and the active residual heat removal system will be provided to permit full core offload into the spent fuel pool and as a backup to the normal spent fuel pool cooling system. Two permanently mounted 15 KW ancillary diesel generators will be provided to supply post-72 hour power to post accident monitoring instrumentation, emergency lighting and PCS makeup pumps. The ancillary diesel generators will be protected from natural phenomena, including seismic events, consistent with GDC 2. Post-72 hour control room habitability and instrumentation & control (I&C) equipment room environmental control will be established by opening the control room doors and establishing natural circulation cooling since Westinghouse believes that dose rates in the main control room will be negligible 72 hours after a design-basis accident (DBA). This is a change from the previous AP600 post-72 hour actions associated with control room habitability in which additional bottled air would be brought in from offsite to protect operators from radiological exposure (if necessary after 72 hours). Portable control room air conditioning units and portable diesel generators to power the air conditioning units would no longer be used as part of the post-72 hour action approach to cool the control room and I&C equipment spaces.

Highlights of the staff's feedback on the proposed changes include the following:

- In determining water flow from the PCS to the containment shell for the 7 day period following a DBA, what was the Westinghouse containment pressure criteria after 24 hours? The staff also noted that the 18 gpm water flow to the containment shell after 72 hours appears to be outside the range of qualified water coverage data.

February 20, 1997

- Because issues related to the calculation of source terms have not been resolved, the acceptability of opening the control room doors after 72 hours (from a DBA dose perspective) will need to be looked at closely by the staff.
- The staff questioned Westinghouse's assertion that the AP600 global seismic analysis would not be substantially affected by the proposed changes to the PCS tank.
- Since Westinghouse is relying on boiloff as the seismically qualified method of removing heat from the spent fuel pool and because the AP600 design does not include a seismically qualified heating, ventilation, and air conditioning system, Westinghouse will need to address where the steam goes from the spent fuel pool boiling and how it would affect main control room habitability after 72 hours.
- The availability controls of the ancillary diesel generators will need to be explained. In addition, the controls on quarterly testing and how testing will be implemented by the COL applicant will need further clarification.

Westinghouse requested that formal feedback on its presentation and proposed design changes be provided by February 11, 1997. The staff agreed to this commitment.

Attachment 1 is the list of meeting attendees. Attachment 2 is a copy of the presentation handouts.

original signed by:

William C. Huffman, Project Manager
Standardization Project Directorate
Division of Reactor Program Management
Office of Nuclear Reactor Regulation

Docket No. 52-003

Attachments: As stated

cc w/attachments:
See next page

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DATE	02/20/97	02/26/97						

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Westinghouse Electric Corporation

Docket No. 52-003

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Docket File

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PDST R/F

TMartin

DMatthews

TQuay

WHuffman

TKenyon

JSebrosky

DTJackson

SCollins/FMiraglia, 0-12 G18

ATHadani, 0-12 G18

GHolahan, 0-8 E2

GLainas, 0-7 D24

JMoore, 0-15 B18

GBagchi, 0-7 H15

WDean, 0-17 G21

CMiller, 0-10 D4

TMarsh, 0-8 D1

CBerlinger, 0-8 H7

JCalvo, 0-7 E4

JWermiel, 0-8 H3

DISTRIBUTION w/o attachments:

JLyons, 0-8 E23

ALevin, 0-8 E23

ACubbage, 0-8 E23

HWalker, 0-8 D1

JRaval, 0-8 D1

ETHrom, 0-8 H7

JKudrick, 0-8 H7

DThatcher, 0-7 E4

NTrehan, 0-7 E4

REmch, 0-10 D4

JLee, 0-10 D4

HLi, 0-8 H3

TCheng, 0-7 H15

MGareri, 0-8 H3

JHolmes, 0-8 D1

SJones, 0-8 D1

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JDawson, 0-8 H7

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ACRS (11)

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JFOS

WESTINGHOUSE - NRC MEETING
ON PROPOSED AP600 DESIGN CHANGES TO ADDRESS
POST-72 HOUR ACTIONS
FEBRUARY 4, 1997

MEETING ATTENDEES

<u>NAME</u>	<u>ORGANIZATION</u>
Brian McIntyre	Westinghouse
Ed Cummins	Westinghouse
Ron Vijuk	Westinghouse
Tom Hayes	Westinghouse
Gary Holahan	NRC
Tom Kenyon	NRC (Part Time)
Alan Levin	NRC
Ted Quay	NRC
Bill Huffman	NRC
Jim Lyons	NRC
Mario Gareri	NRC
Narider Trehan	NRC
Dale Thatcher	NRC
Jay Lee	NRC
Rich Emch	NRC
Hulbert Li	NRC
Tom Cheng	NRC
Jeff Holmes	NRC
Steve Jones	NRC
Brian Thomas	NRC
Chang Li	NRC
Jack Dawson	NRC
Ed Throm	NRC
Jack Kudrick	NRC
Amy Cabbage	NRC
Steve Mixon	NUS
Charles Thompson	DOE

PRESENTATION HANDOUT MATERIAL

FROM FEBRUARY 4, 1997, MEETING ON

PROPOSED AP600 DESIGN CHANGES TO ADDRESS

POST-72 HOUR ACTIONS



AP600 Systems Changes Post 72 Hour and Spent Fuel Pool Cooling

**Presentation to
NRC Staff**

**R. P. Vijuk
Manager, Systems Engineering
(412) 374-4728**



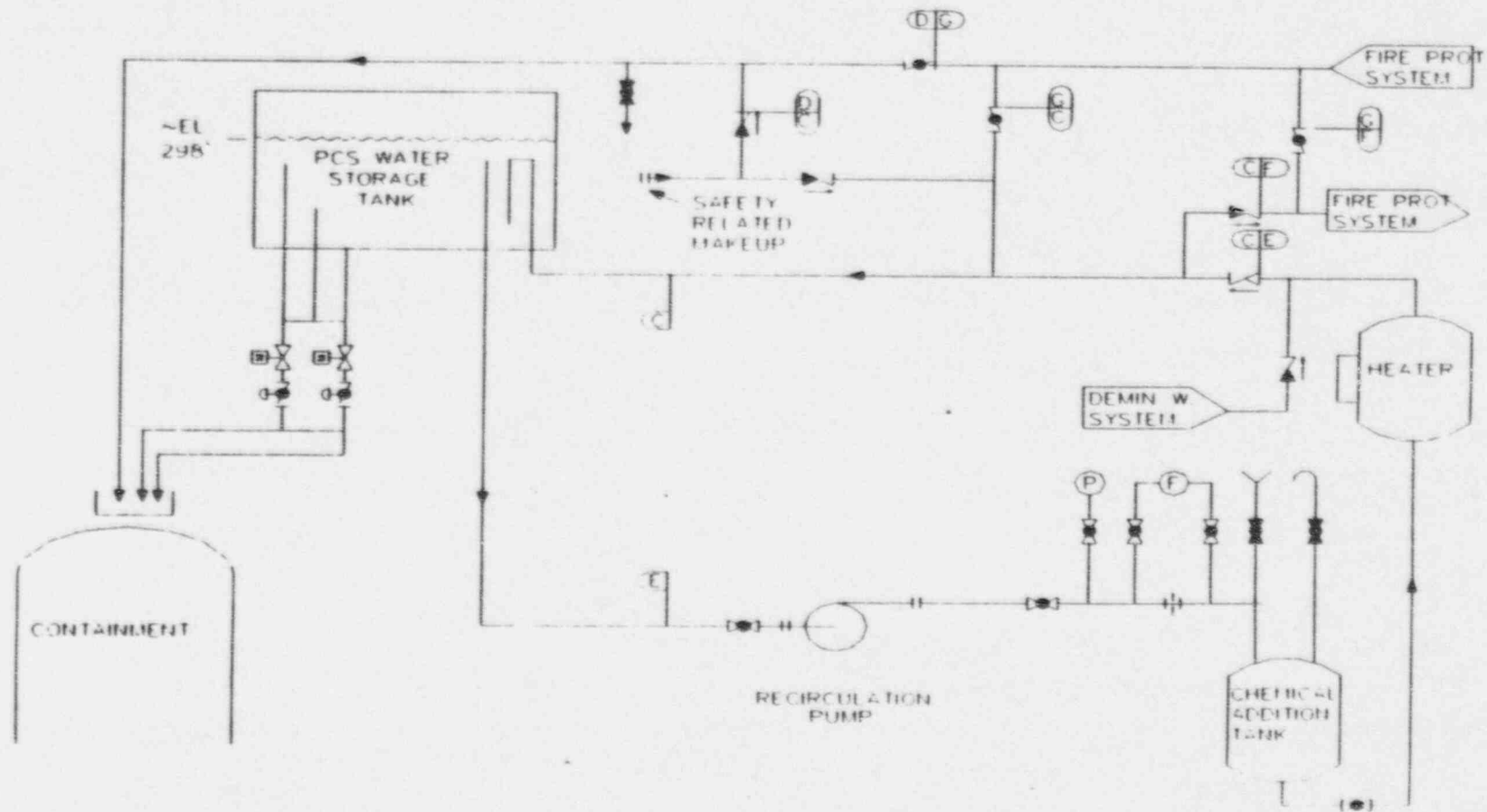
AP600 PCS Design Changes

- Additional 150,000 gallons of water in PCS storage tank on top of shield building
- Add fourth stage standpipe for additional control of flow from PCS tank to containment shell over 7 days
- Modify PCS recirculation path to also serve as post 7 day onsite equipment for makeup to PCS tank
 - Replace single pump with two higher head pumps
 - Modify piping/valves to provide pump suction from grade level connection to water tankers
 - Backup power to pumps from ancillary diesels
- Add piping connection from PCS tank to spent fuel pool for long term makeup in scenarios with no fuel in reactor vessel

AP600 PCS Makeup Current Design



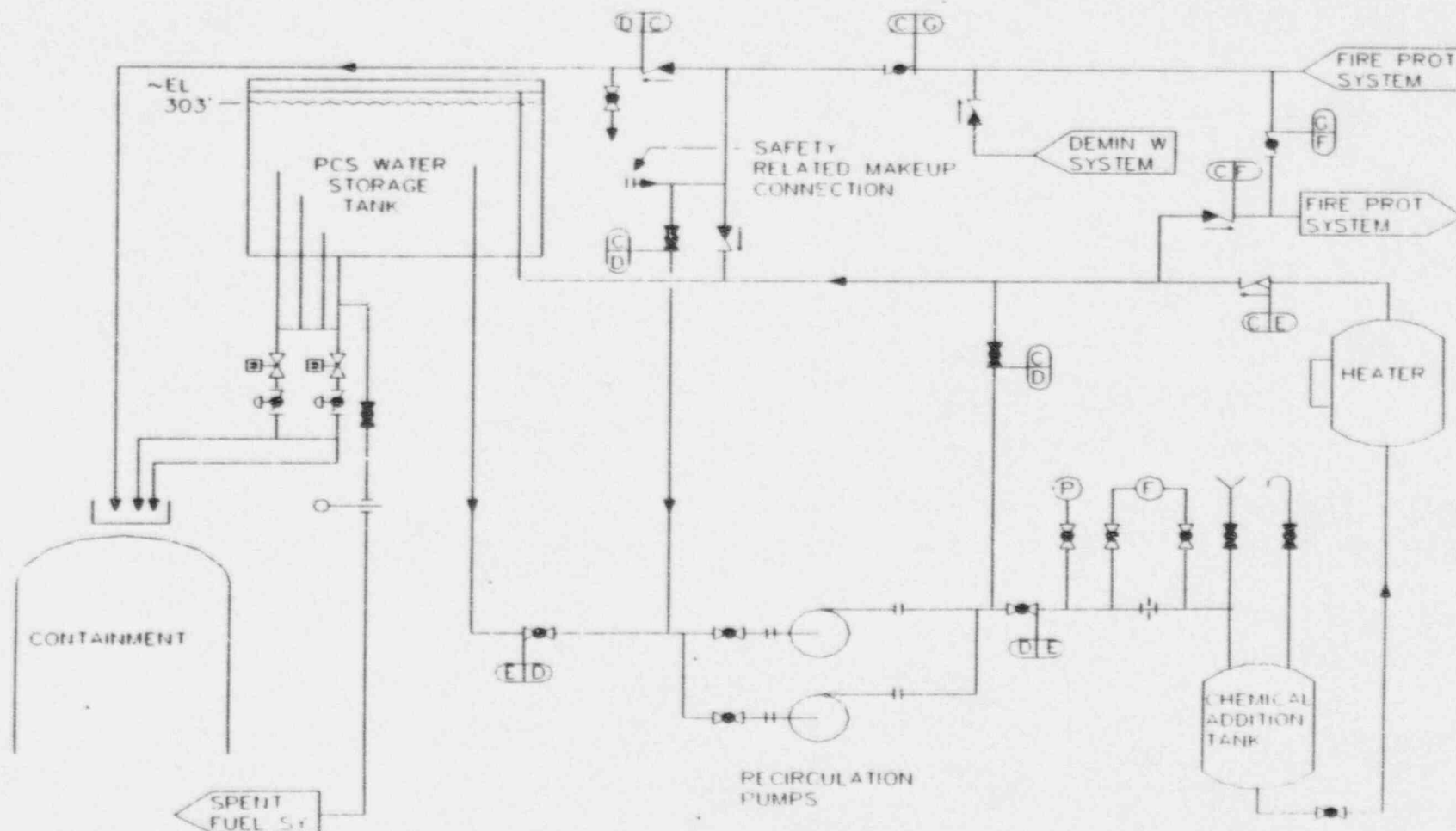
PCS MAKEUP : CURRENT DESIGN



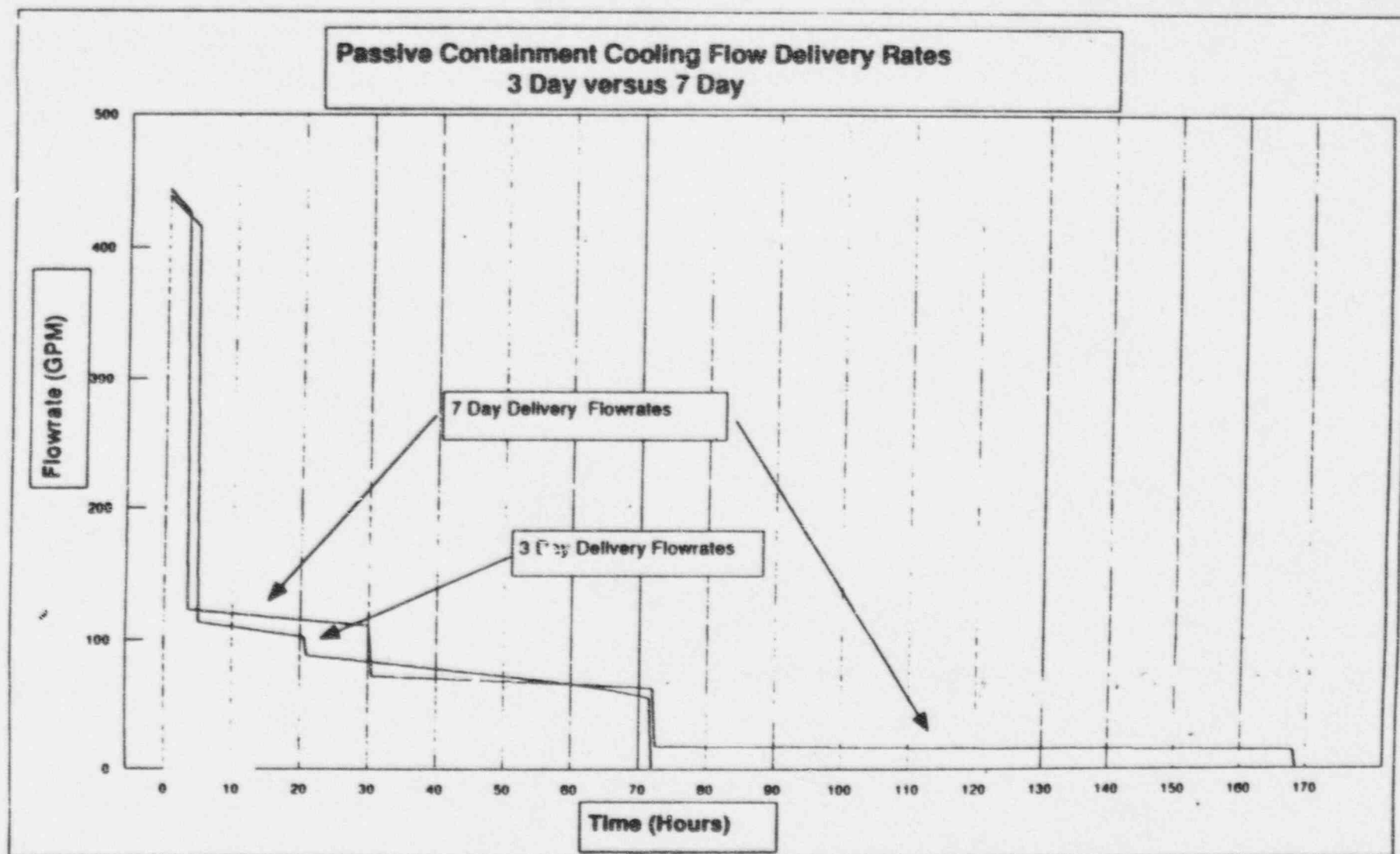
AP600 PCS/SFS Makeup Changes



PCS / SFS MAKEUP : CHANGES



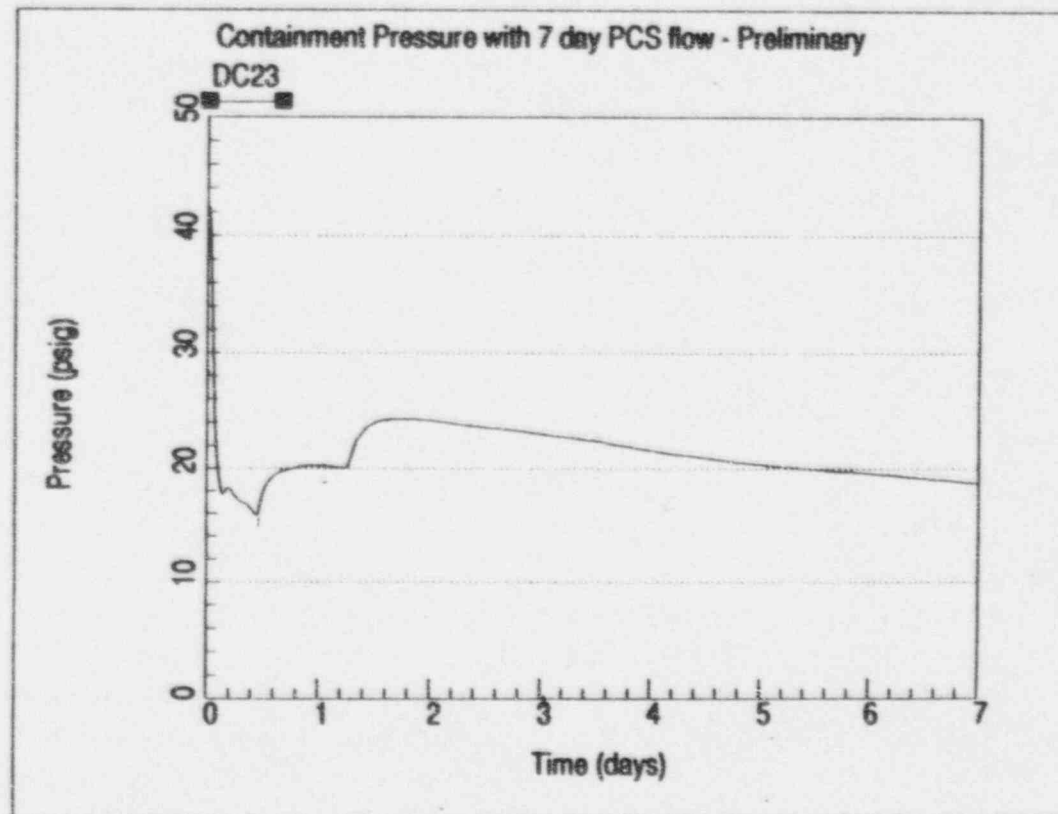
AP600 PCS Design Changes



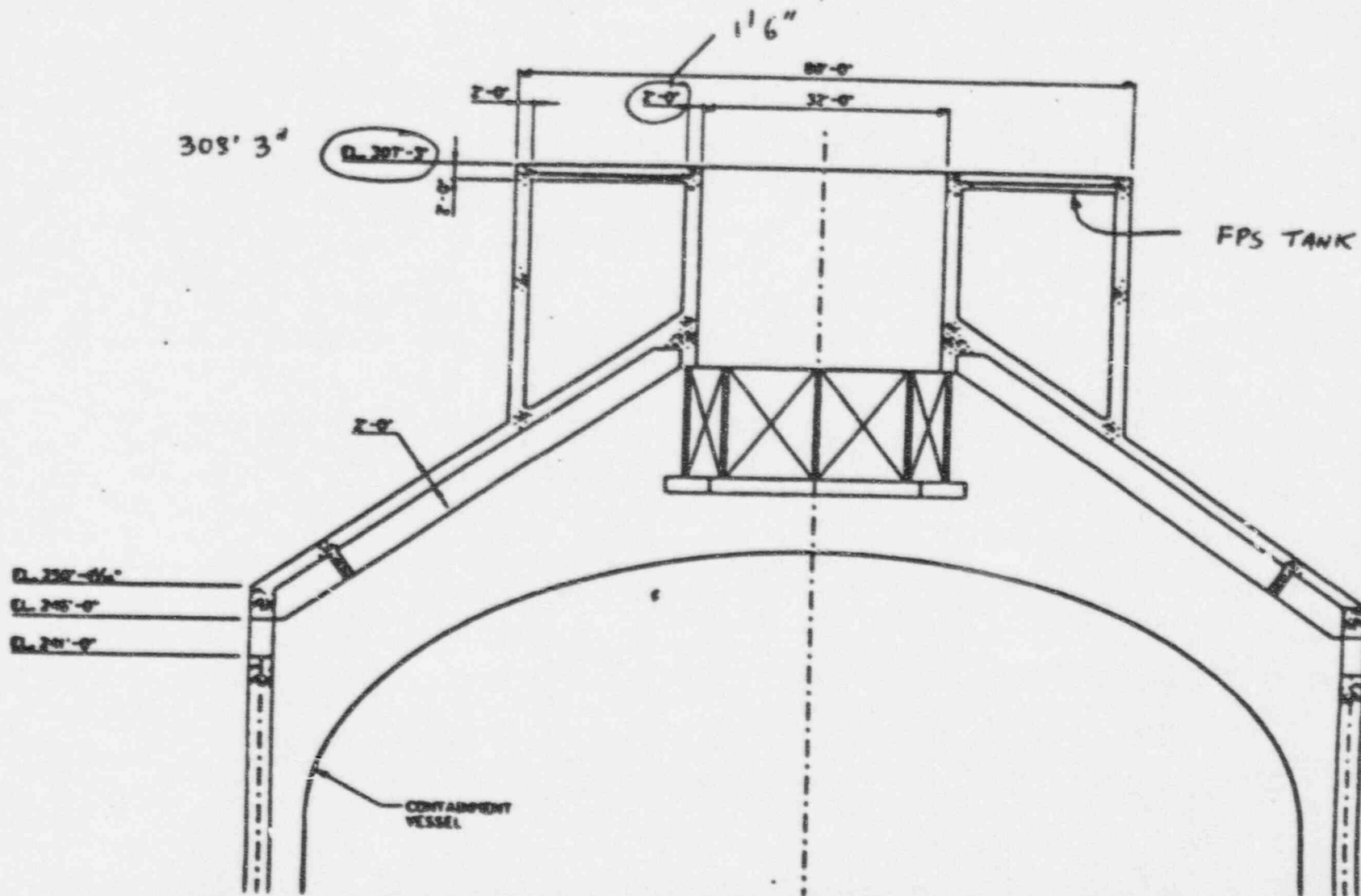
AP600 PCS Design Changes



7daysced
Fri Jan 31 16:07:29 1997
GOTHIC Version W-gothic 4.0 - Wed May 8 14:22:49 EDT 1996



AP600 Evaluation of Shield Building Roof Structural Changes



AP600 Shield Building Roof Structural Changes



- Maximum water level in PCS tank increased 5 feet from elevation of 298' to 303'. Top of tank is raised 1 foot resulting in freeboard above maximum water level of 39 inches which is sufficient to prevent water sloshing due to SSE from impacting the underside of the roof.
- Supplemental fire water inventory (18,000 gallons) included in small tank integral with PCS tank roof. This tank is maintained full.

AP600 Shield Building Roof Structural Changes



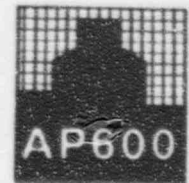
- PCS tank roof construction revised from 24 inch thick reinforced concrete to 15 inches reinforced concrete on top of 9 inch deep stainless steel fire tank. The fire tank has stainless plates top and bottom plus radial beams. This construction meets SSAR commitment for protection from tornado missiles and meets SRP guidelines for minimum thickness.
- Inner wall of tank (chimney side) decreased from 24 inches to 18 inches - this meets SRP guidelines for minimum thickness for tornado missile protection.

AP600 Evaluation of Shield Building Room Structural Changes



	Current Design	Proposed	Units	Percent Increase
WEIGHT OF STRUCTURE ABOVE ELEVATION 260	9630	9100	kips	
WEIGHT OF PCS/FPS WATER	3757	4907	kips	
TOTAL WEIGHT (FULLY EFFECTIVE FOR VERTICAL SEISMIC)	13387	14007	kips	+4.6
EFFECTIVE HORIZONTAL SEISMIC WEIGHT OF WATER (30%)	1127	1440	kips	
TOTAL EFFECTIVE WEIGHT FOR HORIZONTAL SEISMIC	10757	10540	kips	-2.0

AP600 Evaluation of Shield Building Roof Structural Changes



- For horizontal seismic, mass decreases by 2%, for vertical seismic, mass increases by 5%. These changes are small enough that they will have negligible effect on the global seismic analyses of the nuclear island.
- The changes in loads will have small effect on the structural design of the shield building roof. The design calculations for the shield building roof including the local seismic analyses are being updated. These documents have been reviewed by NRC staff during recent audits of the critical sections. A summary will be provided to NRC showing the effect of the design change. This includes:

AP600 Evaluation of Shield Building Roof Structural Changes



- 3D finite element analysis of roof used to develop the equivalent stick model used in the global nuclear island seismic analyses
- Dynamic sloshing analysis with increased inventory
- Design calculation of shield building roof
- Concrete outline and reinforcement drawings
- Seismic margin evaluation of roof structures

AP600 Spent Fuel Pool Cooling



- SECY-96-128, June 12, 1996 review based upon previous design:
 - AP600 Does not comply with SRP or GDC 2
 - SFS should be Seismic I, or
 - Pool makeup water source, building, and HVAC should be Seismic I
 - Additional on site SFP cooling capability should be added
 - AP600 should be capable of sustaining design basis events for 7 days without offsite support



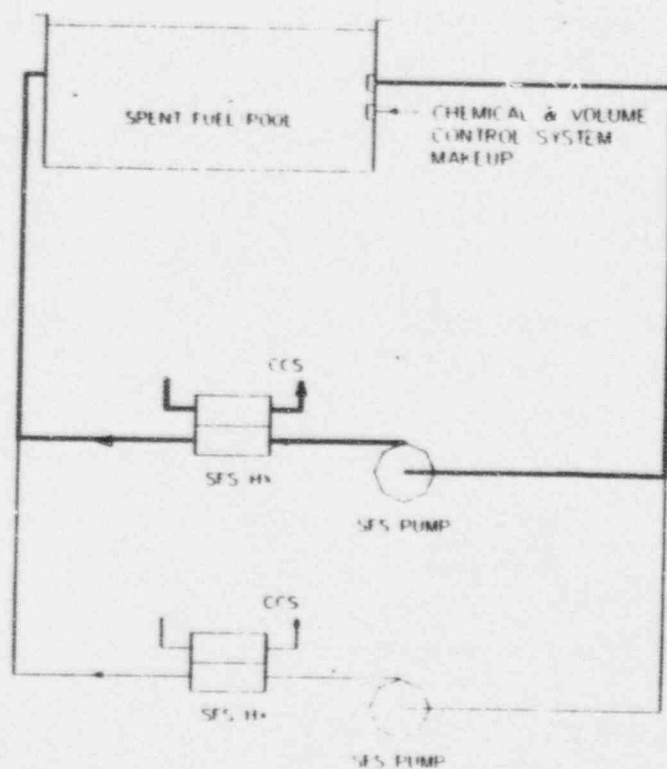
AP600 Spent Fuel Pool Cooling

- **AP600 SFS Design Changes**
 - Significantly Enhance Spent Fuel Pool Cooling Capabilities
 - Meets NRC Position on Spent Fuel Pool Cooling in SECY-96-128
 - Meets SRP and URD Criteria for Full Core Offload as Normal Refueling Practice

AP600 Spent Fuel Pool Cooling



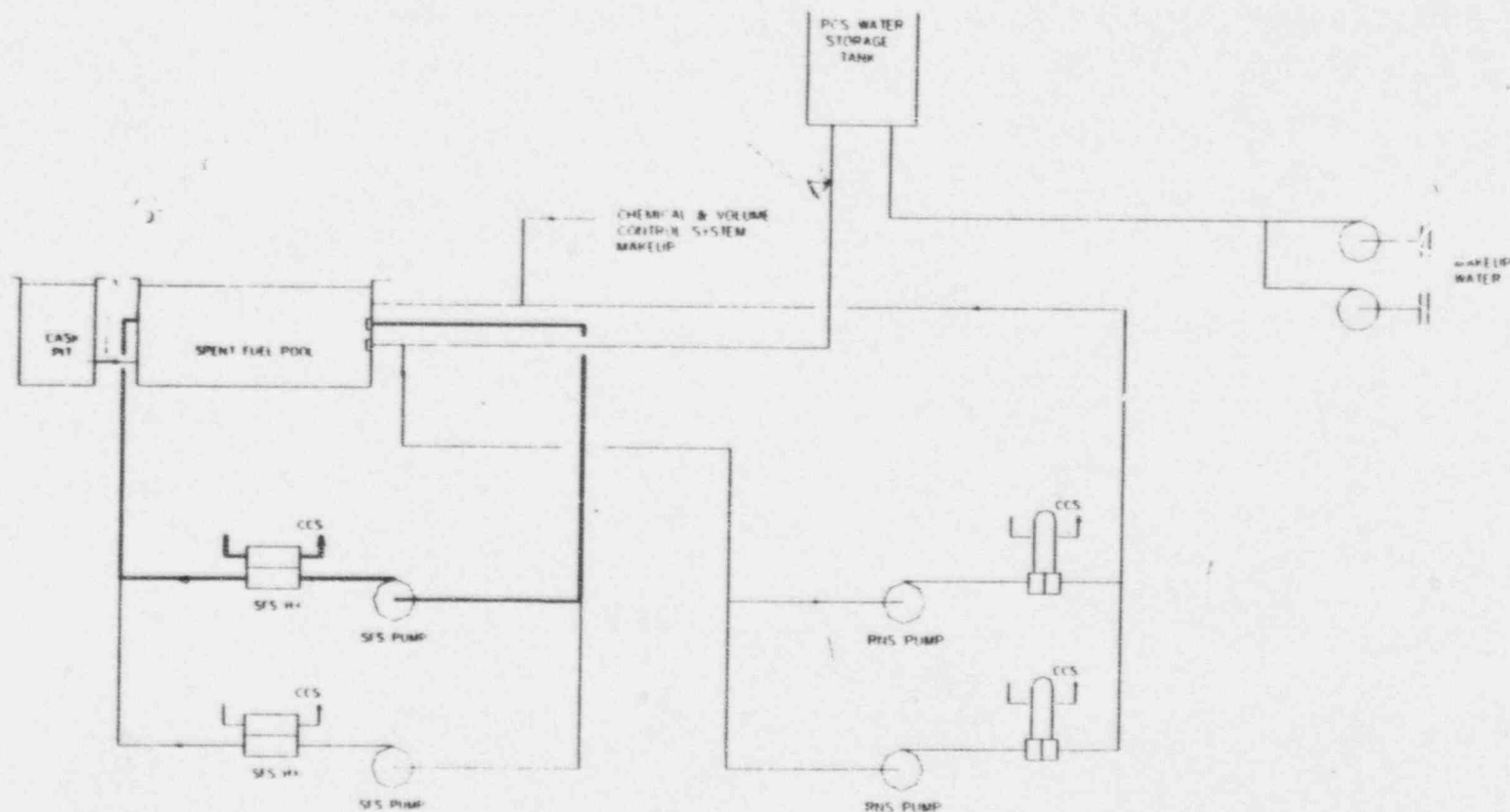
AP600 SPENT FUEL POOL COOLING SYSTEM BEFORE CHANGES



AP600 Spent Fuel Pool Cooling



AP600 SPENT FUEL POOL COOLING SYSTEM
AFTER CHANGES



AP600 Spent Fuel Pool Cooling



- **AP600 SFS Design Changes (continued)**
 - Cross connections added to normal residual heat removal system (RNS)
 - RNS can provide 100% of SFP cooling when normal RHR is not in use for RCS
 - RNS pressure boundary is Seismic I
 - Seismic I makeup water line added from safety-related PCS water storage tank
 - Seismic I makeup water line added from cask wash down pit (CWP)



AP600 Spent Fuel Pool Cooling

- **AP600 SFS Design Changes** (continued)
 - Number of safety-related SFP level instruments increased from two to three (diverse power divisions)
 - Seismic I qualified drain lines and isolation valves for fuel transfer canal and CWP moved to secure, vital area.
 - Level instrument added to cask wash down pit
 - “Normal Refueling” redefined as Full Core Offload
 - Calculations demonstrate compliance with SRP and URD requirements for normal refueling with full core offload

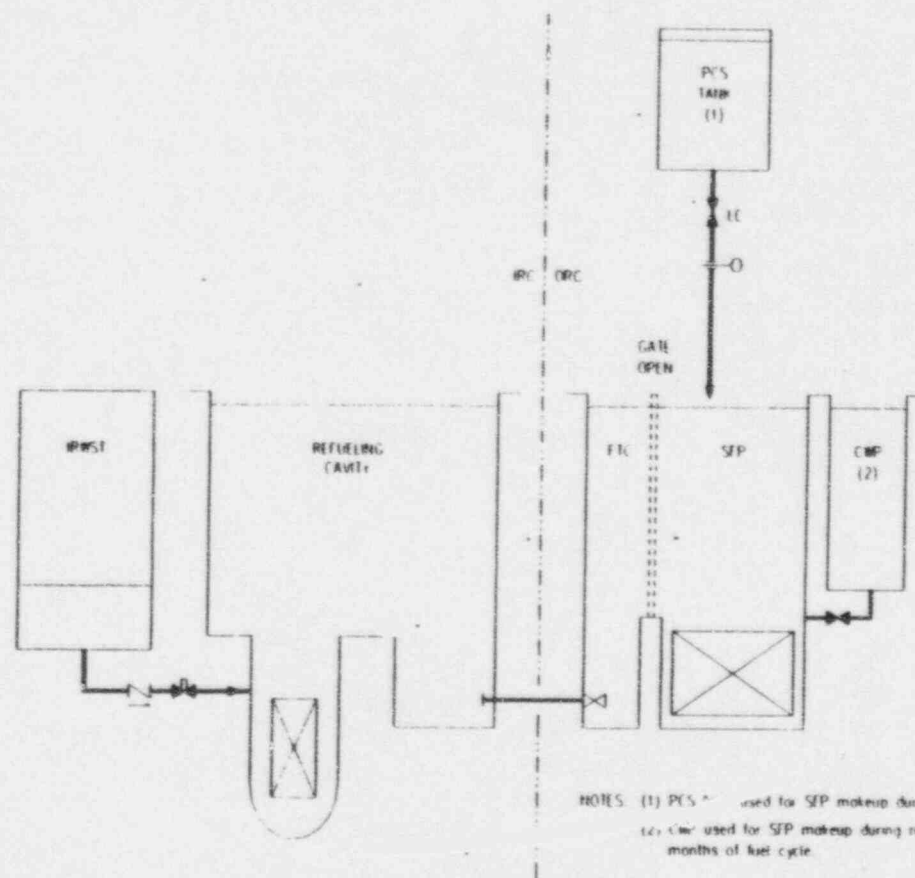
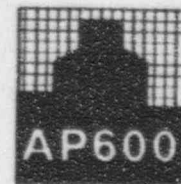
AP600 Spent Fuel Pool Cooling



- **AP600 SFP Cooling Capabilities**

- Seismic I, safety-related passive makeup to SFP available for more than 7 days
- Normal Residual Heat Removal System provides 100% backup SFP cooling during full core offload and during power operation
- Seismic I, safety-related makeup path to SFP is available from RCS tank which is supplied from on-site pumps for post 7 day makeup (post 72 hour design changes) with water from offsite

AP600 Passive Spent Fuel Cooling



PASSIVE SPENT FUEL COOLING CAPABILITIES

Design Basis Case:

Events All DBA (including external)
 Basis / Assumptions Safety-related, SSE
 Timing of Offsite Support After 7 days

Case	Condition (1)	Offload Fuel In SFP	Water Supplies				Time to Saturation Hours (2)	Fuel Cover @ 7 days, feet (3)	Uncover Time, days (4)
			S F R	F T C	C W P	P C S			
1	Emergency full core offload	1 core @ 150 hr, 1/3 core @ 17 days	x	x	x	x	5.1	8.3	10.3
2	Refueling	1 core @ 150 hours	x	x	x	x	6.0	8.3	12.6
3	Refueling	1/3 core @ 150 hours	x	x	x		16.3	2.1	7.7
4	Power	1/3 core @ 17 days	x	x	x		22.5	6.4	9.2
5	Power	1/3 core @ 4 months	x	x			46.0	12.2	16.3
6	Power	1/3 core @ 1 year	x				52.4	14.7	18.7

Notes:

- (1) All scenarios assume 10 years of spent fuel in the pool.
- (2) Time after loss of normal cooling when SFP reaches saturation temperature.
- (3) Depth of water covering spent fuel after 7 days of loss of normal cooling. Makeup is from on-site safety-related water supplies as indicated.
- (4) Time after loss of normal cooling when spent fuel starts to uncover. Makeup is from safety-related water supplies as indicated.



AP600 Spent Fuel Pool Cooling

• Offsite Release Assessment

- Off site dose analysis for boiling pool shows compliance with 10CFR20 with no mitigating HVAC filtration or processing
- SRP is met by providing Seismic I, safety-related coolant inventory and makeup water system. HVAC provision of SRP is not applicable (no HVAC filtering is credited for dose mitigation)

AP600 Spent Fuel Offsite Doses



- **Loss Normal Spent Fuel Cooling**
 - LPZ dose is 1% of NRC limit, 0.1 rem TEDE (10 CFR 20)
 - No iodine removal in nonsafety HVAC or in building
 - All activity assumed to be I-131
 - Boil-off rate based on full core off-load
 - Iodine partition factor .01 (same as SGTR)
 - Conservative atmospheric factors



AP600 Spent Fuel Offsite Doses

- **Fuel Drop Accident**

- Site boundary dose is $< 32\%$ of NRC limit, 6.25 rem TEDE
- LPZ dose is less than site boundary dose
 - No iodine removal in nonsafety HVAC or in building
 - All activity assumed to be I-131
 - No boiling during site boundary dose calculation (2 hour)
 - Heatup/boil-off rate based on full core off-load
 - Iodine partition factor .01 (same as SGTR)
 - Conservative atmospheric factors



Open Items Resolution

- Changes described today are considered by Westinghouse as resolution for the following Open Items:

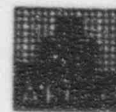
- # 4170 Spent Fuel Pool Cooling
- # 1018 Post 72 Hours
- # 4149 Post 72 Hours
- # 4163 Post 72 Hours

AP600 Main Control Room Habitability



- MCR is pressurized by MCR Habitability System (VES) for at least 72 hours
- Analysis shows that MCR stays within habitability limits by using natural ventilation after 72 hours
 - Heat loads very low
 - Operator dose remains within 10CFR20 limit (5 rem TEDE)

AP600



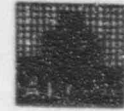
POST-72-HOURS DESIGN CHANGES

February 4, 1997

TOM HAYES
AP600
PLANT ENGINEERING



AP600

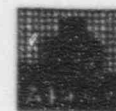


POST-72-HOURS DESIGN CHANGES

OBJECTIVE: Make design changes to the AP600 design so that the site is capable of sustaining all design basis events with onsite equipment and supplies

Replenishment of consumables after 7 days is expected. The equipment required after 72 hours will not be in automatic mode but will be protected from natural phenomena.

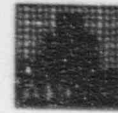




POST-72-HOURS DESIGN CHANGES

- CRITERIA:**
- The functions required for long term safety of the plant include:
 - Core cooling and reactivity control
 - Containment cooling and ultimate heat sink
 - Main control room (MCR) habitability
 - Post-accident monitoring
 - Spent fuel pool cooling
 - Equipment and a 7-day supply of consumables is stored onsite.
 - Provisions for connection of temporary equipment for PCCWST fill and PAMS electrical supply will be retained. *Temporary connections provide a back-up for onsite equipment.*





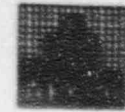
POST-72-HOURS DESIGN CHANGES

CRITERIA: (cont.)

- The onsite equipment provided for post-72 hours is at least classified as non-seismic, Equipment Class D and is protected from credible natural events. *The equipment is analyzed or evaluated to show that it will withstand an SSE and located above the site maximum flood level.*
- The buildings that contain this equipment are at least classified as AP600 Class D and seismic Category 2. *The buildings will be analyzed to show they will withstand an SSE and a 145 mile-per-hour wind.*



AP600



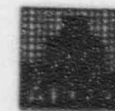
POST-72-HOURS DESIGN CHANGES

CRITERIA: (cont.)

- Control of equipment required for post-72 hours is local at the components.
- Redundancy is provided for active components. *Separation of redundant components is not required.*
- The functions provided by this equipment will be tested during plant startup testing.
- The functions provided by this equipment will be covered by Tier I descriptions and ITAACs.
- System level ISTs will be defined to show system operation every 10 years.



AP600



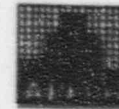
POST-72-HOURS DESIGN CHANGES

CRITERIA: **(cont.)**

- Operating procedures will be provided to require this equipment to be available during specified plant operating modes, to operate the equipment on a specified frequency to show that it is available and to return it to operation if it is found to be unavailable.
- The equipment provided to perform these functions will be included in the RAP program.



AP600

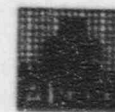


POST-72-HOURS DESIGN CHANGES

- FEATURES:**
- Two ancillary ac diesel generators provide ac power for PAMS, MCR lights, and pump power. -- *PAMS requirements are limited to variables identified as Class 1E in SSAR Table 7.5-1 and required for long term monitoring.*
 - Passive containment cooling system modified to provide cooling for 7 days with onsite water. Provisions added for refilling using onsite equipment.
 - Main control room habitability requirements are met with control room pressurization to 72 hours and natural ventilation after 72 hours.



AP600



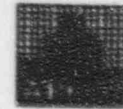
POST-72-HOURS DESIGN CHANGES

FEATURES: **(cont.)**

- Spent fuel pool cooling modified to provide makeup from onsite safety-related water sources that are adequate for at least 7 days.
- Containment makeup is not required for more than 30 days.



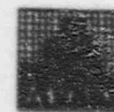
AP600



POST-72-HOURS DESIGN CHANGES

SUMMARY: The proposed AP600 plant design modifications completely address the NRC staff position which was endorsed by the commission. No equipment is required to be brought to the site and no water or consumable is required for at least 7 days.





POST-72-HOURS DESIGN CHANGES

ANCILLARY AC DIESEL GENERATORS

- Two independent 15 kW units and fuel source located together in annex building.
- Located in south-east corner of annex building.
 - *New room with large outside door*
 - *Protected from SSE and 145 mph winds*
 - *Located above site maximum flood level*
- Packaged unit (skid-mount)
- Equipment Class D
 - Rugged design, will withstand SSE
 - Seismic anchors



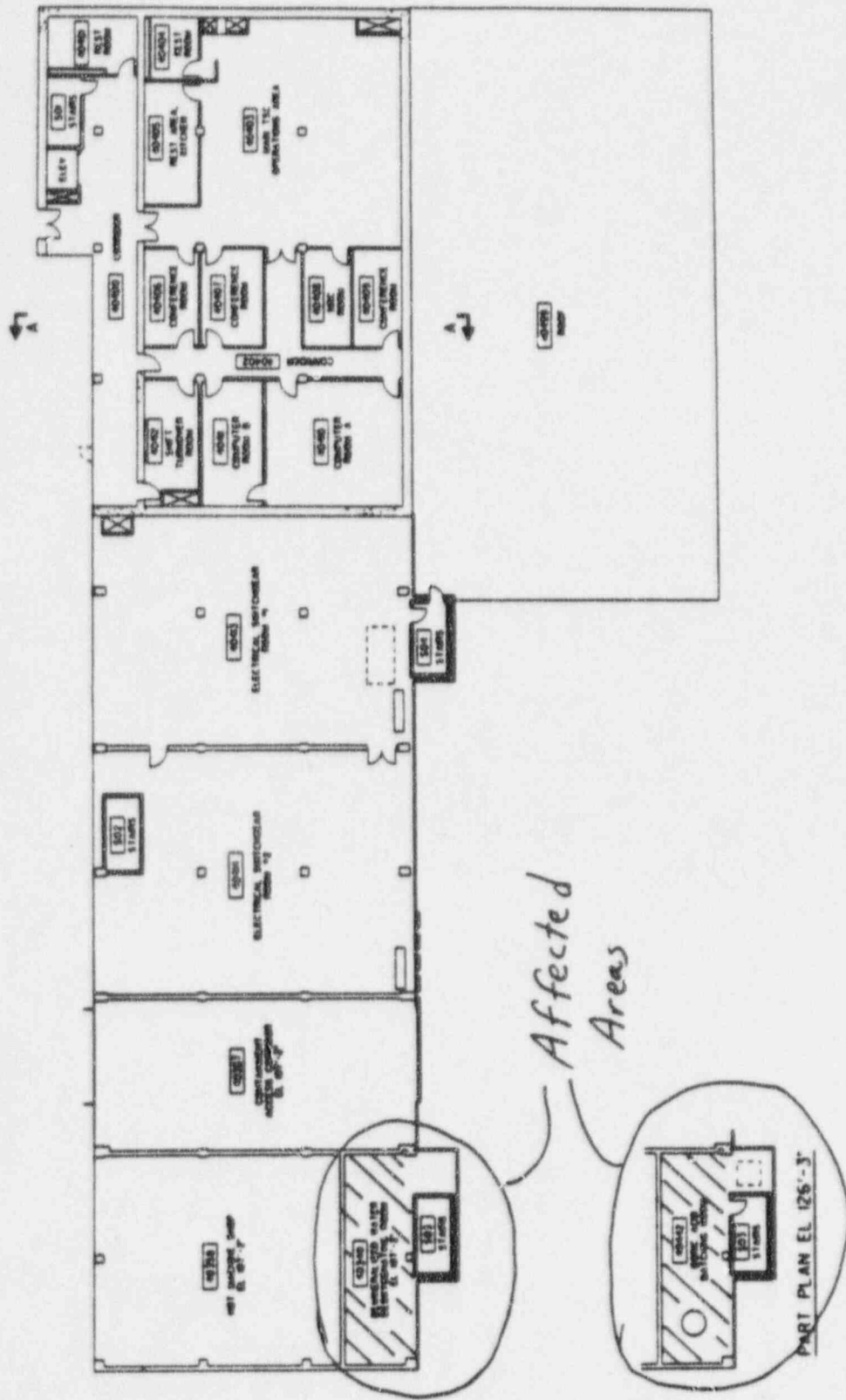
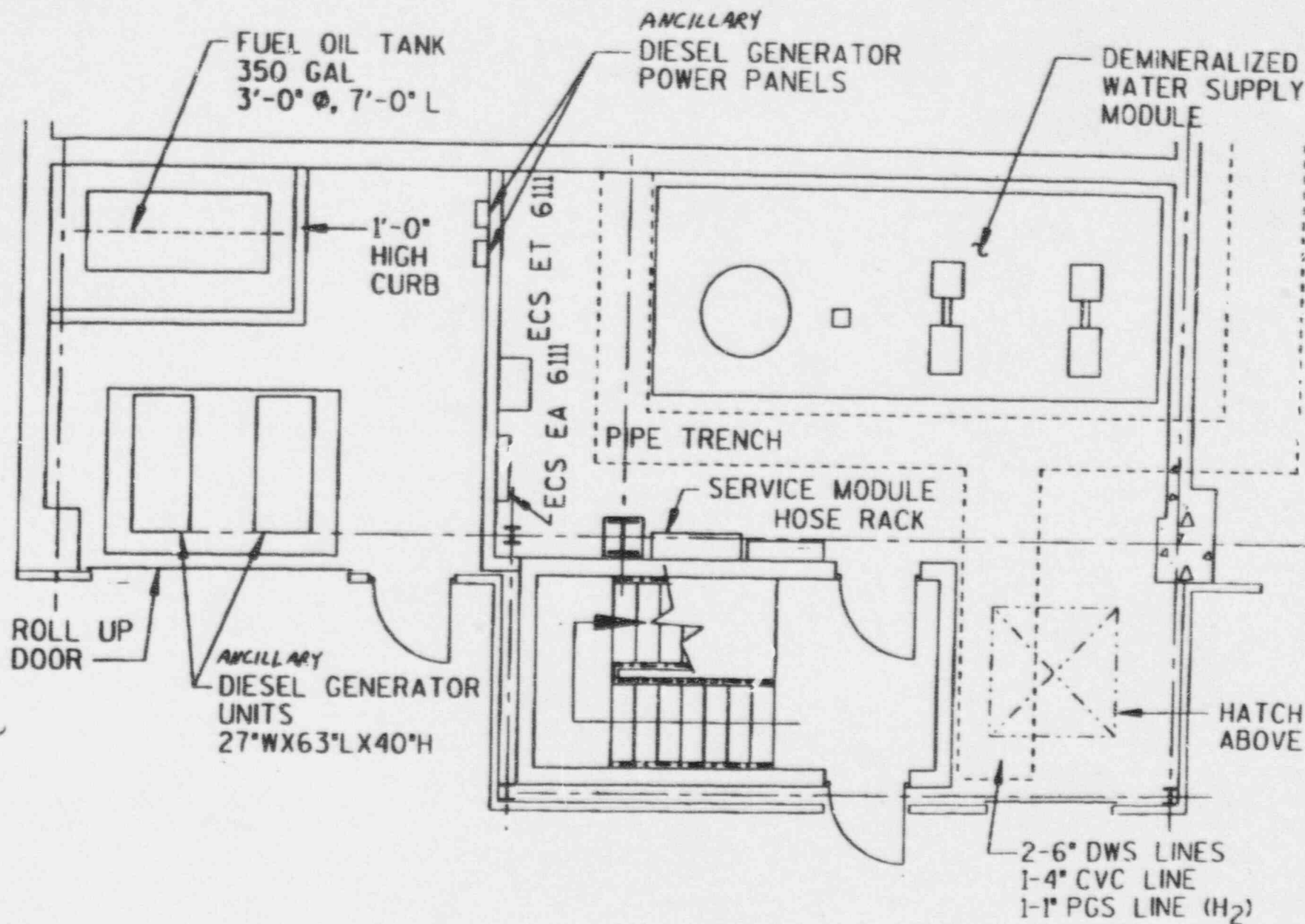


Figure 1.2.19

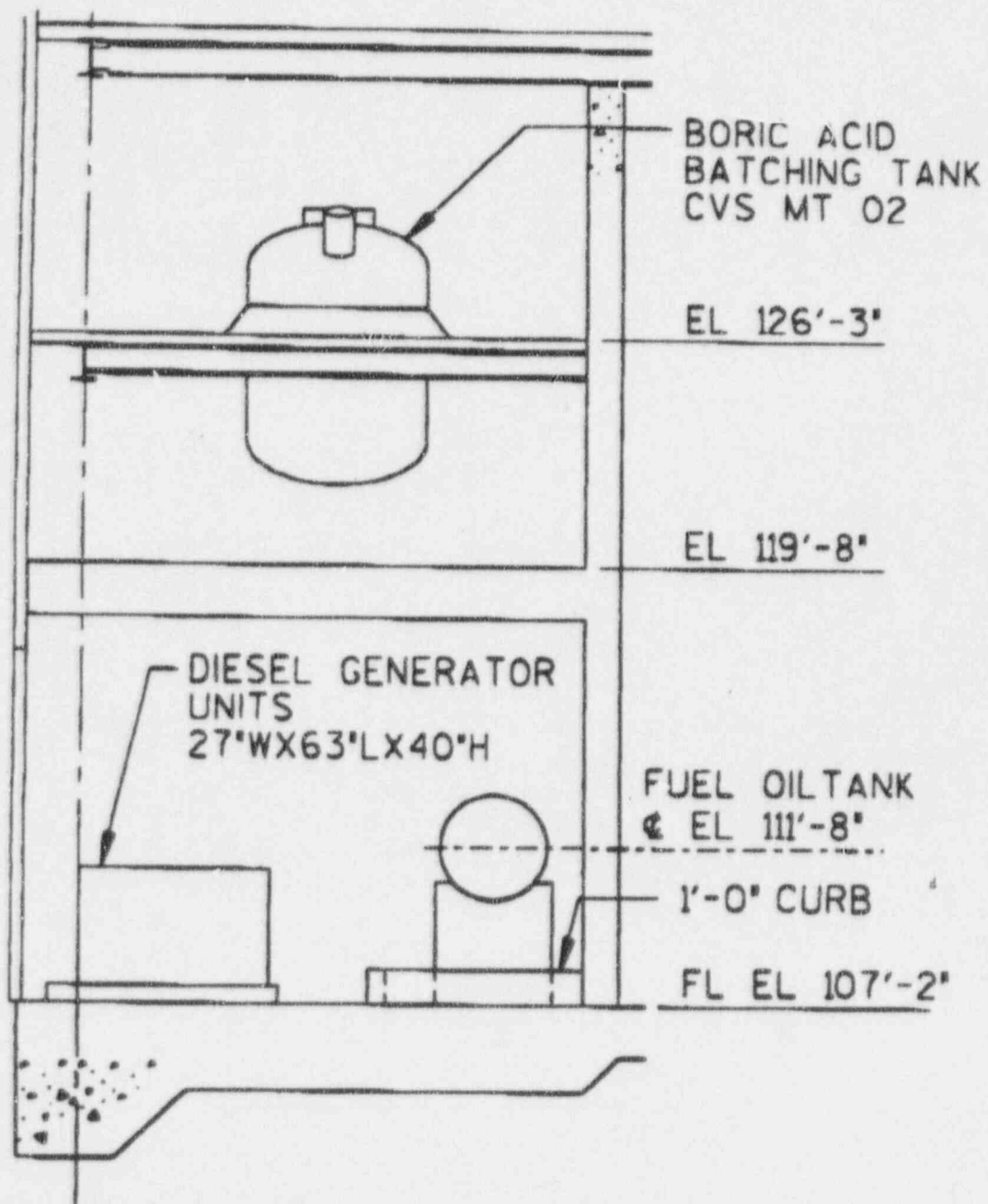
Annex Building General Arrangement
Plan at Elevation 117'-6" & 126'-3"

Revision: 7
August 30, 1996
1.2.63



JAN 18 '97 10:51 FR BURG & ROE

201 966 4459 TO 8054600019141237 P.02





POST-72-HOURS DESIGN CHANGES

ANCILLARY AC DIESEL GENERATORS (cont.)

- 12 Vdc automotive-type starting system with lead-acid battery and float charger -- *Charger is Equipment Class E*
- Local controls and instruments
 - fuel level
 - output voltage, current, frequency (shaft speed)
 - engine temperature and oil pressure
 - starting system voltage
- Exhaust outlet separated from normal building air intakes to allow for diesel testing. -- *Exhaust piping required for operation of ancillary generators is protected (seismic, wind, flood).*



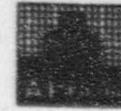


POST-72-HOURS DESIGN CHANGES

ANCILLARY AC DIESEL GENERATORS (cont.)

- Onsite fuel storage
 - 350 gallon capacity tank (*4 days @ 50 gallons/day to meet PAMS and MCR lighting loads + margin for sludge and testing and protection against overfilling*)
 - #2 diesel fuel -- *same as standby power source*
 - Located in same room as ancillary generators
 - Tank, piping, valves will be analyzed to show they will withstand an SSE
 - Refill capability
 - Local indication of fuel level
 - Manual normally-closed valves



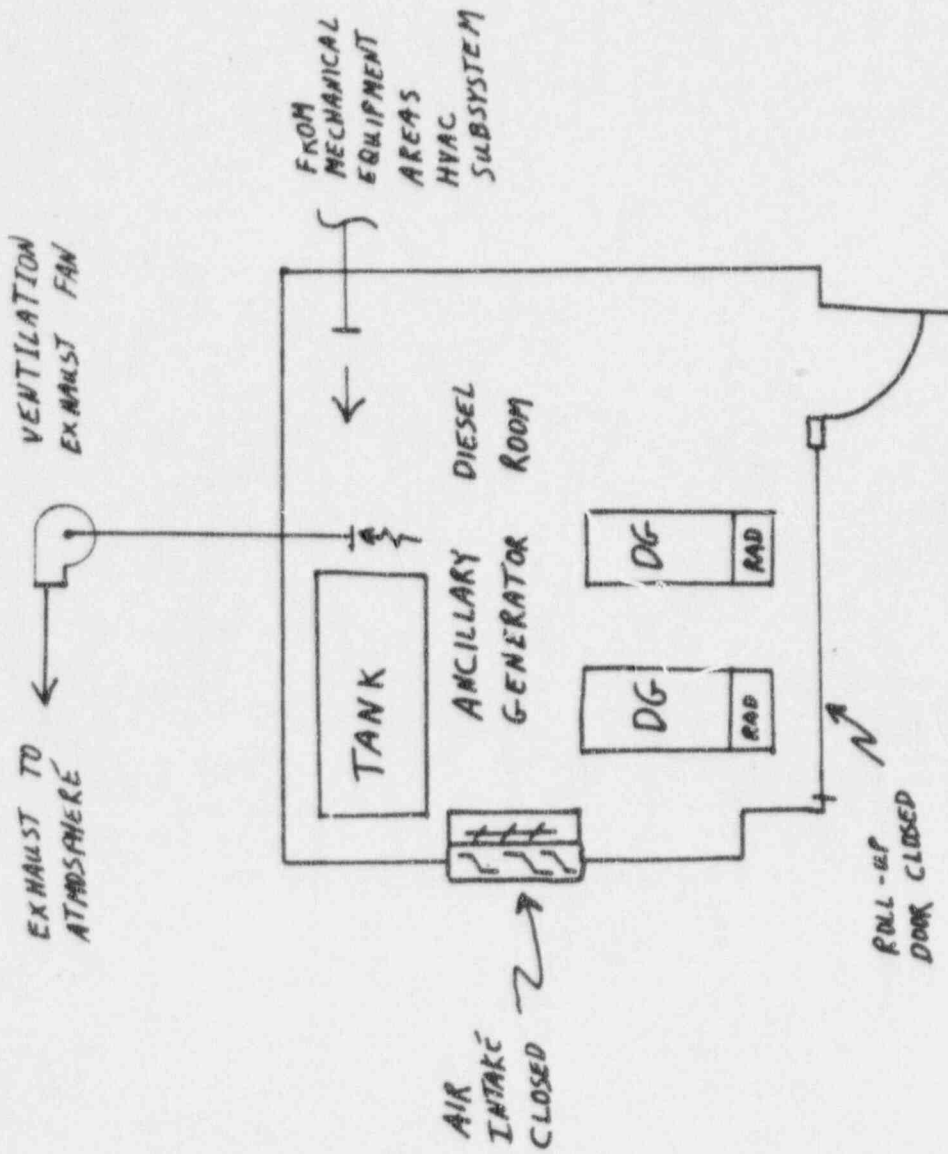


POST-72-HOURS DESIGN CHANGES

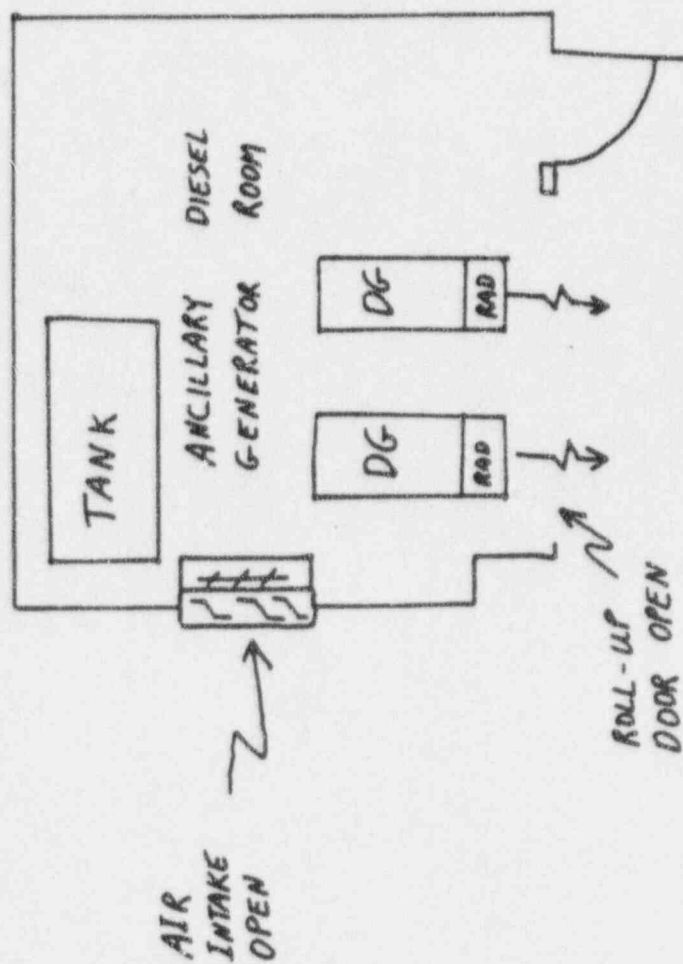
ANCILLARY AC DIESEL GENERATORS (cont.)

- HVAC
 - During normal plant operation air supply is from existing annex building HVAC
 - Normal ventilation exhaust fan to prevent buildup of fumes from fuel
 - During engine operation roll-up door is opened making the room essentially outside -- *During cold weather door may be partially opened to retain some heat in room -- Tank heaters are provided to keep fuel warm.*

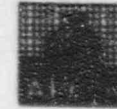




NORMAL VENTILATION



VENTILATION - ANCILLARY DIESEL OPERATION

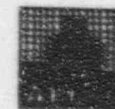


POST-72-HOURS DESIGN CHANGES

ANCILLARY AC DIESEL GENERATORS (cont.)

- **Fire Protection**
 - Ancillary generators and fuel tank are separated from rest of building by a three-hour rated fire barrier.
 - Automatic dry-pipe sprinkler system
 - Hose stations
 - Portable fire extinguishers





POST-72-HOURS DESIGN CHANGES

ANCILLARY AC DIESEL GENERATORS (cont.)

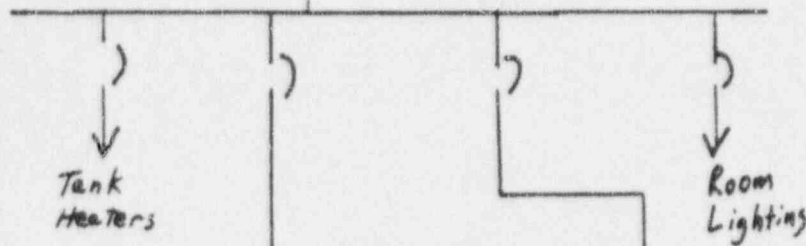
- Electrical connections
 - Local distribution panel -- *one source breaker, four load breakers*
 - Permanently installed cables to loads
 - Class 1E voltage regulating transformer
 - PCS recirculation pump
 - Fuel tank heater
 - Local lighting
 - No provision for parallel operation or cross-connect
 - *"Bumpless" transfer for PAMS loads provided by maintenance bypass switch in Class 1E inverter*



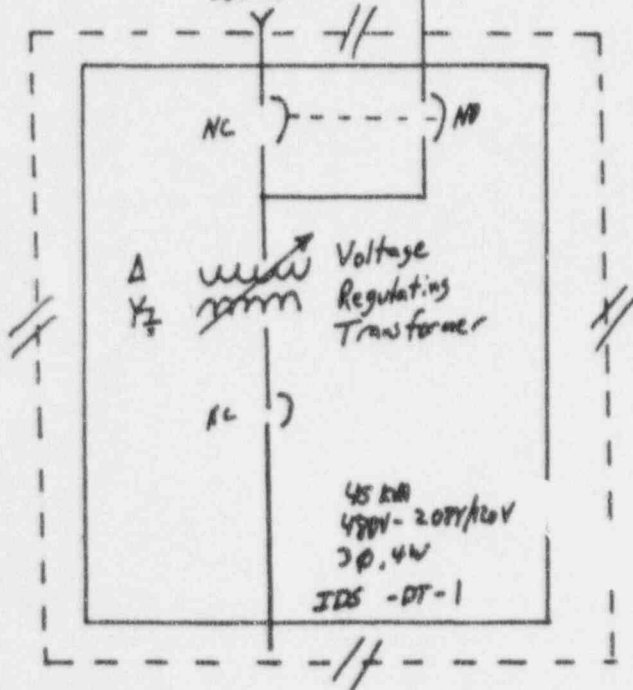
Transportable AC Generator Skid



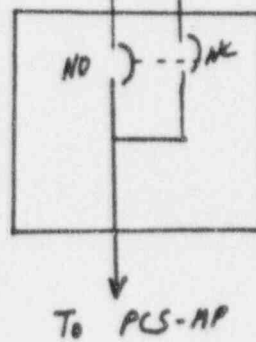
AC Generator #
15 kW, 480 V, 0.8 pf
3Ø, 60 Hz



Normal Source



Normal Source



NOTES

1. THIS LINE DRAWING IS A REPRESENTATION OF THE ELECTRICAL SYSTEM AND DOES NOT SHOW THE PHYSICAL LOCATION OF THE EQUIPMENT.
2. THE EQUIPMENT IS IDENTIFIED BY THE LETTERS A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, AND THE NUMBERS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.
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REFERENCE DRAWINGS

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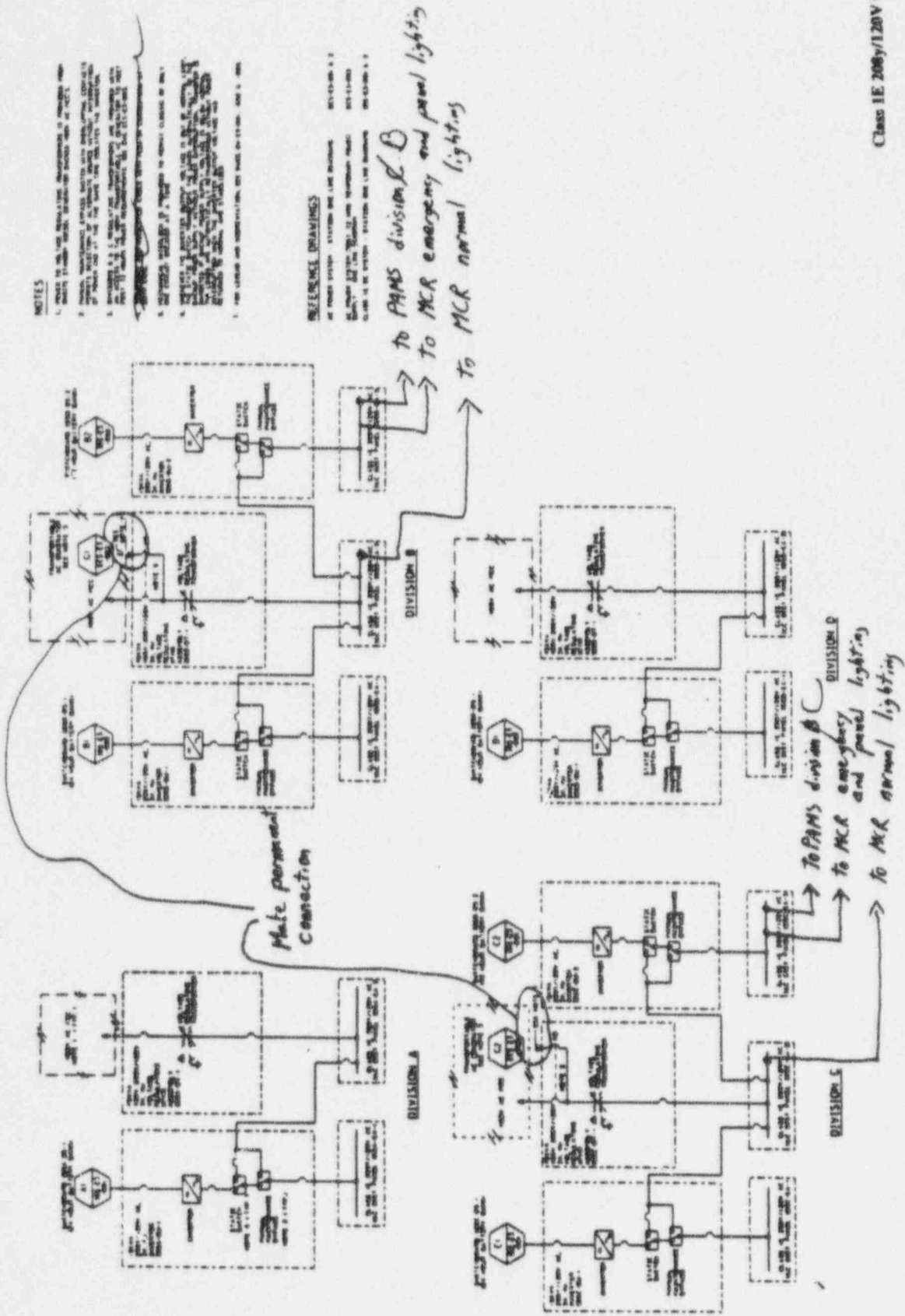
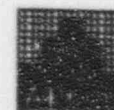


Figure 8.3.2.2

Class 1E 200y/120V UPS One Line Diagram

Revision: 6
March 29, 1996
8.3-65



POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 1 - Revise containment heat removal design basis from 3 days to 7 days.

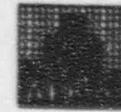
Revise control room habitability and I&C equipment room environmental control post-72 hours design bases from using temporary equipment to natural circulation of air.

Revise figures 1.2-xx to show plant layout changes.

Add onsite equipment provided for post-72 hour support to §1.9.5.4.

Revise spent fuel pool makeup to include 7-day capability.





POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 3 - 3.1.1(Criterion 38) - Change "3 days" to "7 days" (2 places).

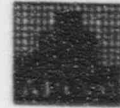
Tables 3.2-3, 3.9-16, & 3.11-1 - Revise classification of valves and add/delete valves.

Figure 3.7.2-12 - Revise PCCWST dimensions. Revise to show doorway change in Waste Monitor Tank Room B.

Table 3.9-17 - Add system level testing to demonstrate system operation every 10 years.



AP600



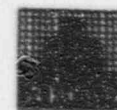
POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 5 - Add spent fuel pool cooling back-up function to normal residual heat removal system.

Revise figure 5.4-7 to show spent fuel pool connections.





POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 6 - Add function for PCS to provide makeup water to the spent fuel pool in the event of a prolonged loss of normal spent fuel pool cooling. Add a description of connection from PCCWST to spent fuel pool.

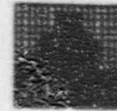
Increase PCCWST volume allocated to passive containment cooling. Second recirculation pump added. Revise passive containment cooling flow rates to reflect 7 day profile.

Revise basis for post-72 hours MCR habitability and I&C room environment to natural circulation

Add fuel oil storage in annex building to table 6.4-1.



AP600



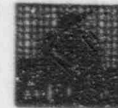
POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 7 - Revise number of spent fuel pool level PAMS instruments from 2 to 3.

Table 7.5-1, Note 1 - Revise from three to four branch flow devices.





POST-72-HOURS DESIGN CHANGES

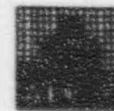
PROPOSED SSAR CHANGES

Chapter 8 - Add description of ancillary diesel generators.

Revise to show new loading for ancillary diesel generators (i.e., delete requirements for ventilation units, add requirements for passive containment cooling system pumps, tank heaters, and diesel room lights).

Revise figures 8.3.1-3 & 8.3.2-2 to show ancillary diesel generator configuration.





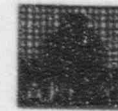
POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 9 - Revise to describe full core off-load as the normal refueling basis heat load and provisions for back-up cooling by the normal residual heat removal system. Add function for passive containment cooling system to provide makeup water to the spent fuel pool in the event of a prolonged loss of normal spent fuel pool cooling. Describe new configuration for spent fuel pool cooling.

Add description of HVAC associated with ancillary diesel generator room.





POST-72-HOURS DESIGN CHANGES

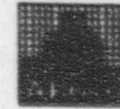
PROPOSED SSAR CHANGES

Chapter 9 - Add fire analysis of ancillary diesel generator area and fuel storage tank. Add fire area 4035 AF 01 containing ancillary diesel generators and fuel tank.

Add description of fuel supply for ancillary diesel generators.

Revise figure 9A-1 to show doorway change in Waste Monitor Tank Room B.



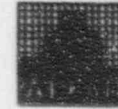


POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

- Chapter 12- Revise figures to show ancillary diesel generator room and doorway change in Waste Monitor Tank Room B.
- Chapter 14- Add tests of ancillary diesel generators and added fluid system functions/connections.
- Chapter 15- Opening the control room will be included in the Chapter 15 dose analysis currently being performed.





POST-72-HOURS DESIGN CHANGES

PROPOSED SSAR CHANGES

Chapter 16- Increase Tech Spec required PCCWST storage volume.

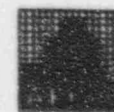
Add Tech Spec section for minimum PCCWST level during full core off-load.

Add Tech Spec section for Cask Washdown Pit Water Level.

Add the equipment required for post-72 hours to the Reliability Analysis Program.



AP600

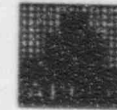


POST-72-HOURS DESIGN CHANGES

PROPOSED ITAAC CHANGES

- 2.2.2 (PCS) - Add test of PCCWST refill function. Add test for spent fuel pool make-up.
- 2.3.3 (DOS) - Add test for ancillary diesel generator fuel tank.
- 2.3.6 (RNS) - Add test for spent fuel pool cooling.
- 2.3.7 (SFS) - Add tests for new RNS cooling and PCCWST refill functions and for new level instruments in SPF and cask washdown pit.
- 2.6.1 (ECS) - Add ancillary diesel generators.





POST-72-HOURS DESIGN CHANGES

PROPOSED SCHEDULE

- 1/30 Submit summary paper to NRC staff for review
- 2/4 Presentation of design changes to NRC staff
- 2/11 Receive feedback from NRC staff
- 2/18 Markups of SSAR text and tables for chapters 1, 3, 5, 6, 7, 8, 9, 12.
- 2/28 Next revision of SSAR containing new text, tables and figures for chapters 1, 3, 5, 6, 7, 8, 9, 12.

Changes to Chapters 14, 15, & 16, and ITAACs will be included in the next scheduled revision for these documents.

