



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V

1450 MARIA LANE, SUITE 210  
WALNUT CREEK, CALIFORNIA 94596

July 30, 1985

MEMORANDUM FOR: Hugh L. Thompson, Director  
Division of Licensing, NRR

FROM: Dennis F. Kirsch, Acting Director  
Division of Reactor Safety and Projects  
Region V

SUBJECT: REGION V INPUT TO ACRS REQUESTS ON PALO VERDE

Enclosed as Attachment 1 is the review of operating experience for the startup of Palo Verde Unit 1.

*D.F. Kirsch* for D.F. Kirsch

D. F. Kirsch, Acting Director  
Division of Reactor Safety and Projects

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## ATTACHMENT 1

### Review of Startup Experience for Palo Verde Unit 1

Region V undertook an enhanced inspection effort of initial criticality and low power testing by providing around-the-clock inspection coverage of these activities. The Inspection Team's findings are summarized below.

Overall, the licensee's preparation for the implementation of initial startup activities was marked by unusual caution and thoroughness.

Initial criticality was achieved at 0145 on May 25, 1985. Boron concentration at initial criticality was within approximately 11 ppm of that predicted, or approximately 0.1 percent reactivity worth. This compares favorably to similar facilities - particularly for a lead plant design.

No significant problems were experienced in the performance of reactor systems and instrumentation. The licensee took steps, in response to observations by the Inspection Team, to improve the working environment within the main control room (principally with regard to noise levels and effective communications) as well as the attentiveness of the control room operators. Notwithstanding the need for some improvement in these areas, the overall performance of the operating crews was good. A strong discipline was evident in the operating staff's adherence to operating procedures.

The presence and effectiveness of operational Quality Assurance personnel in their monitoring and surveillance of operational activities was particularly evident. Likewise, the presence of senior corporate, as well as site management and supervisory personnel, has been noteworthy, and their involvement in day-to-day operational activities has been substantive and effective.

The licensee experienced several occurrences during the power ascension phase in Unit 1. These occurrences are described below.

- 1) Three different reactor trips. Two resulted from loss of feed flow and subsequent high pressurizer pressure trip. One resulted from an inoperable CEAC causing a local power density and DNBR trip.
- 2) Difficulty in identifying the source of RCS leakage on two different occasions. Unidentified RCS leakage exceeded 1 GPM resulting in plant shutdown per Technical Specification requirements.
- 3) Broken condenser baffle causing two leaking tubes and damage of insulation. This resulted in an extended shutdown period for repair.

These operational events were handled in a conservative and responsible manner by the licensee. The number of trips that occurred was not excessive and resulted from anticipated events.

Seven LER's to date have been initiated by the licensee since initial criticality.

Finally, Region V identified one inoperable aspect of the post-accident sampling system (PASS). The portion devoted to sampling containment atmosphere was found to be inoperable due to licensee calculations showing prohibitively high radiation levels in the sample area after an accident. Prior to licensing, the licensee had informed the Commission that PASS was operable. The licensee is currently taking steps to correct this deficiency.

LOSS OF LOAD EVENT

1. Selected vugraphs from Staff meetings
2. Staff's letter of October 2, 1985
3. Region V CAL of September 20, 1985

CONDITIONS PRIOR TO EVENT OF 9-12-85

1. REACTOR AT 53% FULL POWER
2. TURBINE GENERATOR ONLINE AT 585 MWe
3. PREPARING FOR 50% LOSS OF LOAD TEST

PURPOSE OF 50% LOSS OF LOAD TEST:

1. DEMONSTRATE THAT THE PLANT CAN ACCOMMODATE  
A LOAD REJECTION FROM 50% POWER
2. VERIFY THAT THE TRANSIENT DID NOT INITIATE  
A REACTOR POWER CUTBACK

## SEQUENCE OF EVENTS

- 2208 TEST INITIATED BY REMOTE MANUAL OPENING OF BOTH GENERATOR OUTPUT BREAKERS. (TURBINE-GENERATOR FLUCTUATIONS)
- 2209 REACTOR TRIP (FLOW-PROJECTED DNBR TRIP FROM CPC)
- 2209 TURBINE TRIP (CAUSED BY REACTOR TRIP)
- 2215 NON-SAFETY RELATED AUXILIARY FEEDWATER PUMP STARTED
- 2217 ATMOSPHERIC DUMP VALVES (ONE ON EACH STEAM GENERATOR) OPENED 3%
- 2218 MAIN STEAMLINE DRAINS AUTOMATICALLY REOPENED UPON RESTORATION ON NON-1E ELECTRICAL POWER
- 2222 SIAS AND CIAS INITIATED (1837 PSIA; 540° F)  
SIAS AND CIAS ACTUATIONS WERE VERIFIED AS PER DESIGN WITH HPSI INJECTING APPROXIMATELY 75 GPM TO EACH COLD LEG
- 2223 NOTIFICATION OF UNUSUAL EVENT DECLARED DUE TO COMPLICATED REACTOR TRIP AND INITIATION OF A SIAS
- 2225 AUXILIARY OPERATOR RE-ENERGIZED MOTOR CONTROL CENTER NHN-M-72 UNDER CONTROL ROOM DIRECTION (RE-ENERGIZED CHN UV-501, VCT OUTLET AND UV-536, RWT HIGH SUCTION TO CHARGING PUMPS.)



SEQUENCE OF EVENTS (CONT.)

- 2237 CHARGING HEADER LOW FLOW ALARM (40 GPM)  
INTERMITTANT CHARGING HEADER PRESSURE ALARMS  
FOR THE NEXT 43 MINUTES, OPERATORS WERE  
ATTEMPTING TO REESTABLISH CHARGING PUMP  
SUCTION FROM:  
(1) RWT HIGH SUCTION VIA CH UV 536  
(2) RWT LOW SUCTION VIA CHN V 327  
(3) RWT HIGH SUCTION VIA UV 532 -- BAMP  
CH 514 TO THE CHARGING PUMPS (AFTER  
NON-1E POWER RESTORATION)
- 2320 REESTABLISHED CHARGING FLOW WITH TWO CHARGING  
PUMPS INJECTING 44 GPM TO RCS
- 2358 RESET SIAS AND CIAS (RCS PRESSURE AND INVENTORY  
STABLE AND UNDER CONTROL)
- 0102 9/13/85 TERMINATION OF NOTIFICATION OF UNUSUAL  
EVENT

### SCOPE OF AUXILIARY PRESSURIZER SPRAY SYSTEM

- o AUXILIARY PRESSURIZER SPRAY SYSTEM BEGINS AT BRANCH FROM CHARGING SYSTEM AND ENDS AT PRESSURIZER SPRAY NOZZLES
- o MECHANICAL COMPONENTS CONSIST OF:
  - PIPING
  - TWO SOLENOID OPERATED VALVES (CH-203 & CH-205)
  - CHECK VALVE
- o SCHEMATIC OF AUXILIARY PRESSURIZER SPRAY SYSTEM AND SOURCES OF BORATED WATER (VIA CHARGING SYSTEM) SHOWN IN:
  - FIGURE 2.1-4 OF CEN-239, AND
  - FIGURES 5 & 6 OF APPENDIX B IN NUREG-1044



FIGURE 2.1-4  
SIMPLIFIED SCHEMATIC OF PALO VERDE CVCS SHOWING AUXILIARY  
SPRAY PORTION AND SOURCES OF BORATED WATER

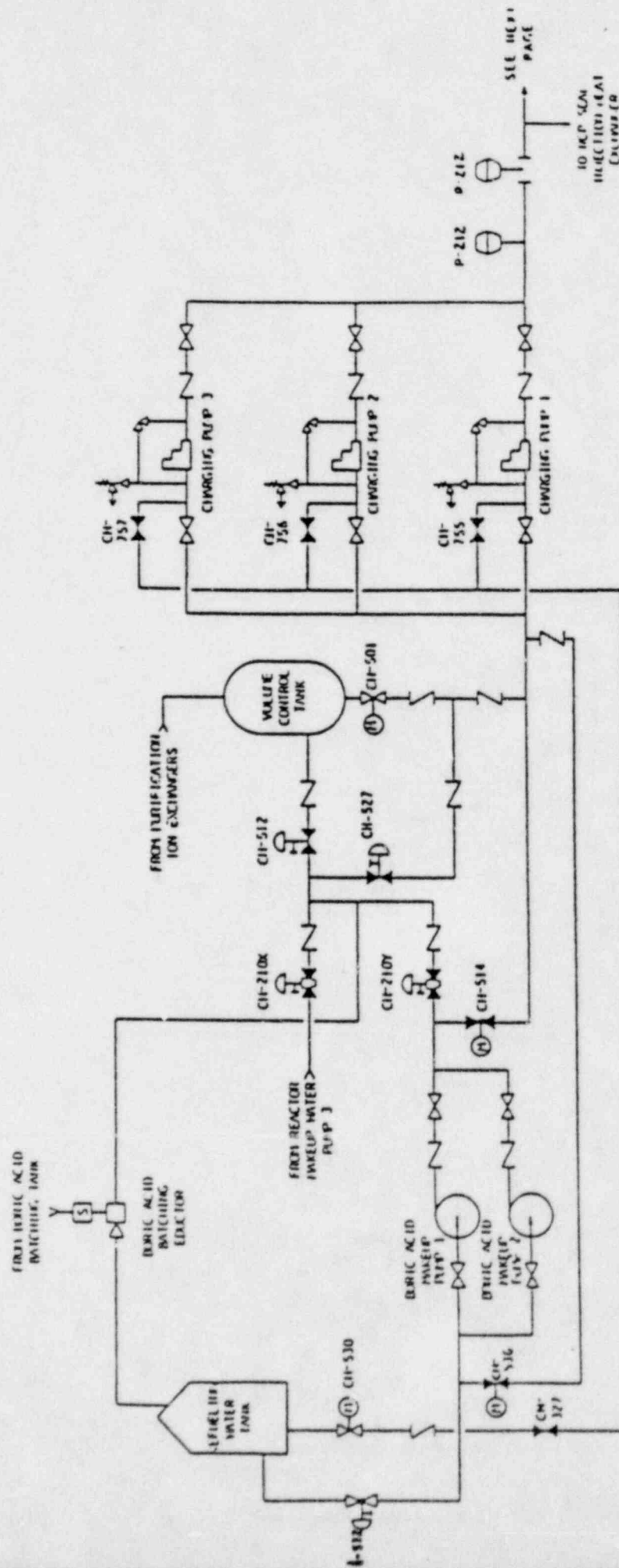
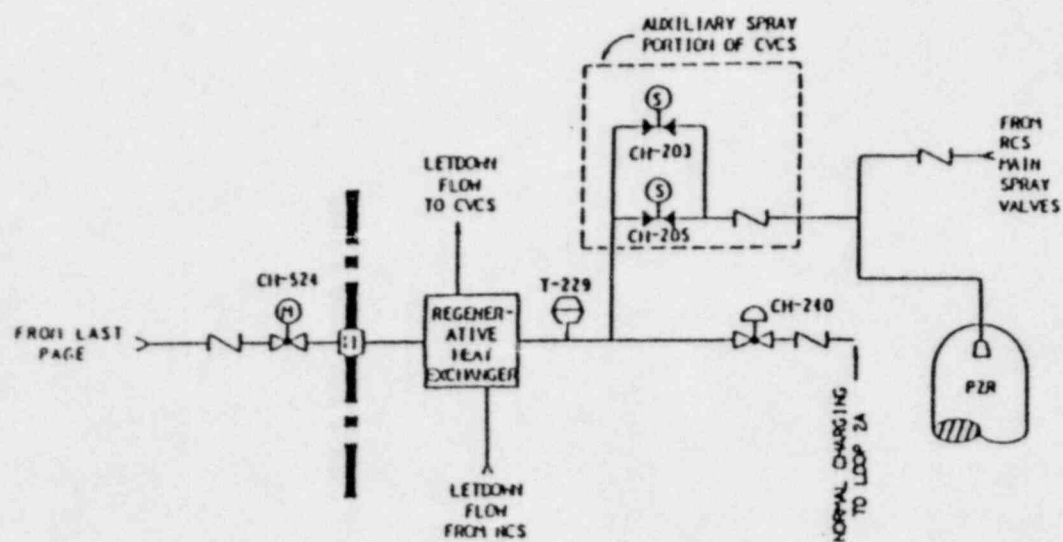


FIGURE 2.1-4 (CONT.)

SIMPLIFIED SCHEMATIC OF PALO VERDE CVCS SHOWING AUXILIARY  
PORTION AND SOURCES OF BORATED WATER



## STEAM GENERATOR TUBE RUPTURE (SGTR) ANALYSES

- o ORIGINAL ANALYSIS INCLUDED IN CESSAR-F (TENDERED IN 1978):
  - BASED ON CATEGORIZATION MATRIX OF CHAPTER 15 (IN ACCORDANCE WITH REG. GUIDE 1.70, REV.2)
  - TUBE RUPTURE ONLY
  - AUXILIARY PRESSURIZER SPRAY WAS NOT CREDITED FOR ANALYSIS TO CALCULATE OFFSITE DOSES
- o ANALYSIS REVISED TO BE CONSISTENT WITH STANDARD REVIEW PLANS (1981/1982):
  - SGTR WITH AND WITHOUT LOSS OF OFFSITE POWER
  - AUXILIARY PRESSURIZER SPRAY WAS NOT CREDITED FOR ANALYSIS TO CALCULATE OFFSITE DOSES
  - CREDIT WAS TAKEN FOR THREE SECOND TIME DELAY BETWEEN REACTOR TRIP AND LOSS OF OFFSITE POWER
- o NRC STAFF REQUIRED RE-ANALYSIS WITH ADDED SINGLE FAILURE AND RECOGNITION OF EMERGENCY OPERATING PROCEDURES PER CEN-152 (APRIL 1983)
- o SEPARATE ANALYSES WERE PERFORMED FOR CESSAR AND PALO VERDE (1984). BOTH ANALYSES RECOGNIZED USE OF AUXILIARY PRESSURIZER SPRAY (AS AN OPERATOR ACTION)
- o NEW PALO VERDE ANALYSIS IS BEING PERFORMED, WHICH DOES NOT USE AUXILIARY PRESSURIZER SPRAY IN THE FIRST TWO HOURS

PVNGS-FSAR (APPENDIX 15A)

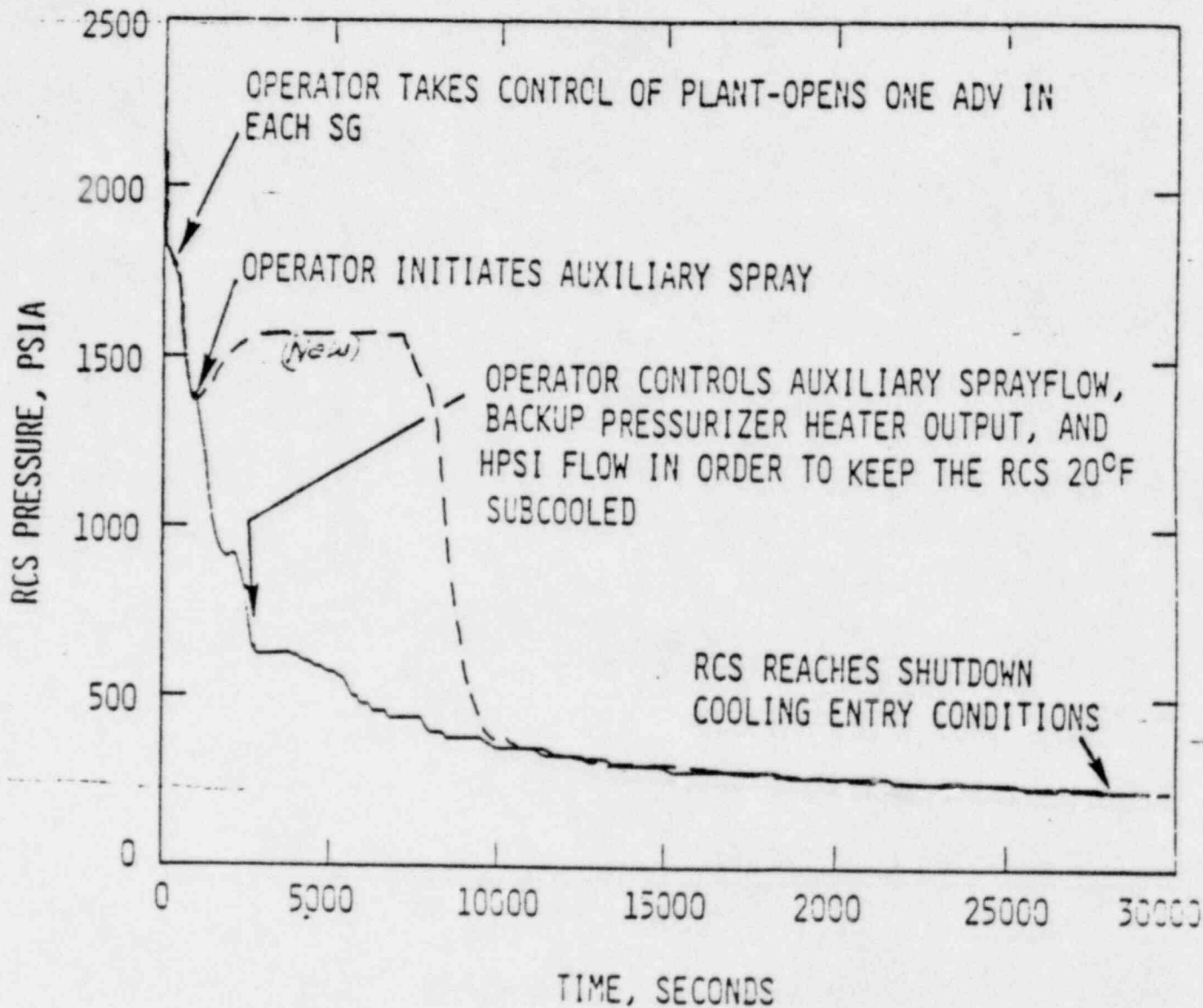
SGTR ANALYSIS RESULTS

<u>EVENT</u>	<u>TIME</u> (SECONDS)	FSAR * <u>THYROID DOSE</u> (REM)	REVISED ANALYSIS* <u>THYROID DOSE</u> (REM)
SGTR & STUCK OPEN ADV	0	0	0
LOP	51	0	0
AFAS	132	0	0
ADV OPENS	460	0	0
MSIS	513		
SIAS	581		
AFW OVERPIDE	655		
AUX SPRAY	<sup>(1)</sup> 1015/ <sup>(2)</sup> 7200	115	115
TUBES RECOVERED	<sup>(1)</sup> 1385/ <sup>(2)</sup> 1347	182	186
2 HP DOSE @ EAB	7200	200	208

\* REGULATORY DOSE LIMIT IS 300 REM

(1) - Current FSAR

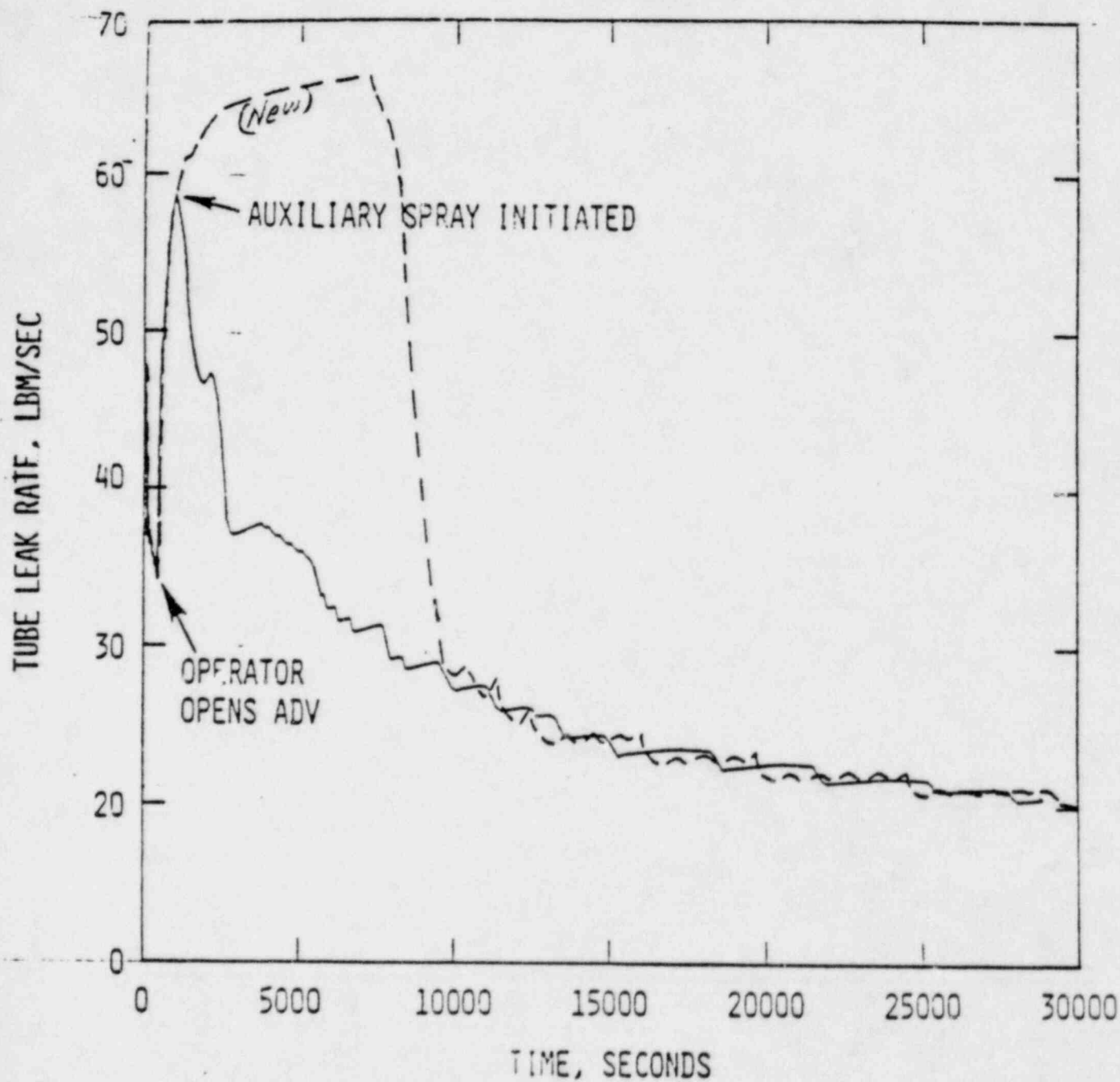
(2) - New Analysis




Palo Verde Nuclear Generating Station  
FSAR

STEAM GENERATOR TUBE RUPTURE WITH LOSS  
OF OFFSITE POWER AND A FULLY STUCK  
OPEN ATMOSPHERIC DUMP VALVE  
RCS PRESSURE VS TIME

Figure 15A-3 (Sheet 2 of 2)

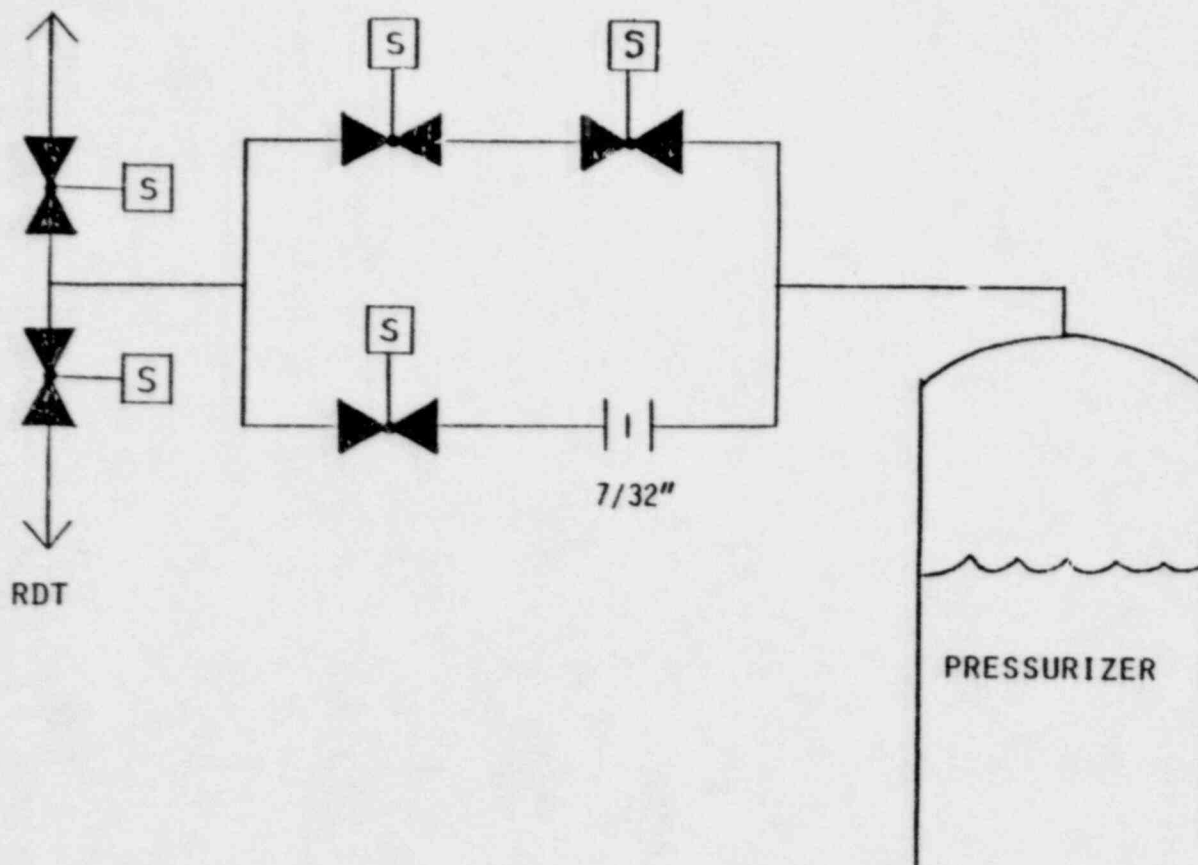


 Palo Verde Nuclear Generating Station  
FSAR

STEAM GENERATOR TUBE RUPTURE WITH LOSS  
OF OFFSITE POWER AND A FULLY STUCK  
OPEN ATMOSPHERIC DUMP VALVE  
TUBE LEAK RATE VS TIME  
Figure 15A-11 (Sheet 2 of 2)



CONTAINMENT  
ATMOSPHERE



PRESSURIZER VENT PATHS

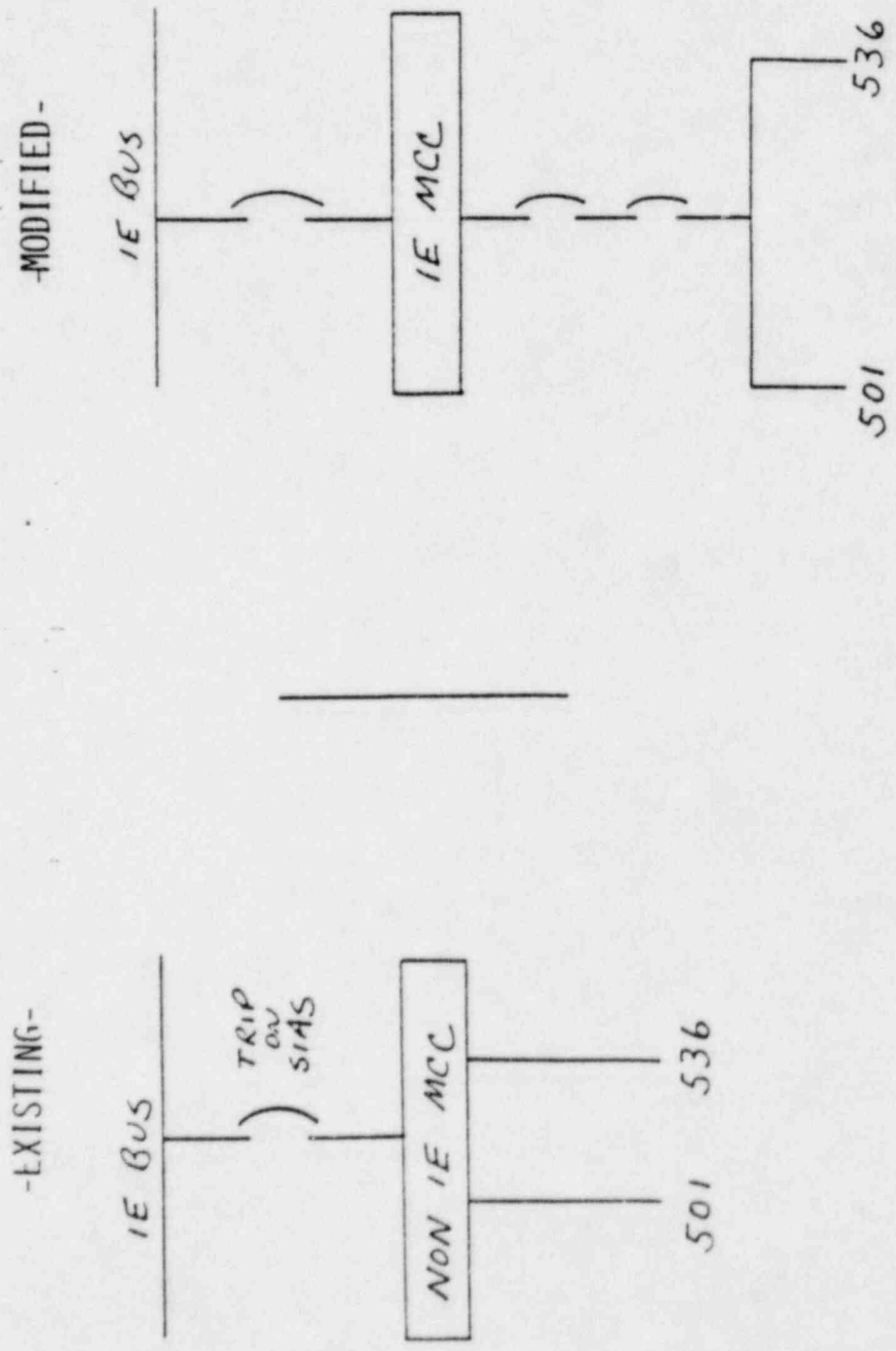
PRESSURIZER VENT SYSTEM  
DEPRESSURIZATION DURING SGTR

- REDUNDANT CLASS 1E QUALIFIED VENT PATHS
- LIMITING PATH (7/32 INCH ORIFICE)
  - DEPRESSURIZATION RATE OF 3 PSI/MIN (vs 18 PSI/MIN WITH AUXILIARY PRESSURIZER SPRAY)
  - PROVIDES ACCEPTABLE DEPRESSURIZATION PERFORMANCE
- EMERGENCY OPERATING PROCEDURES ADVISE OPERATOR OF AVAILABILITY OF VENT TO BACKUP PRESSURIZER AUXILIARY SPRAY

## CVCS ENHANCEMENT

- o REPORT OF ACTIONS UNDERTAKEN TO ADDRESS SEPTEMBER 12, 1985  
EVENT ( PER SEPTEMBER 20, 1985 MEETING )
- o THREE MODIFICATIONS PLANNED
  - ENSURE CONTINUED CONTROL OF V501 AND V536  
FOLLOWING LOP AND SIAS
  - ADD SECOND, DIVERSE REFERENCE LEG FOR VCT  
LEVEL MONITORING WITH ALARM
  - AUTOMATIC REALIGNMENT OF V501 AND V536

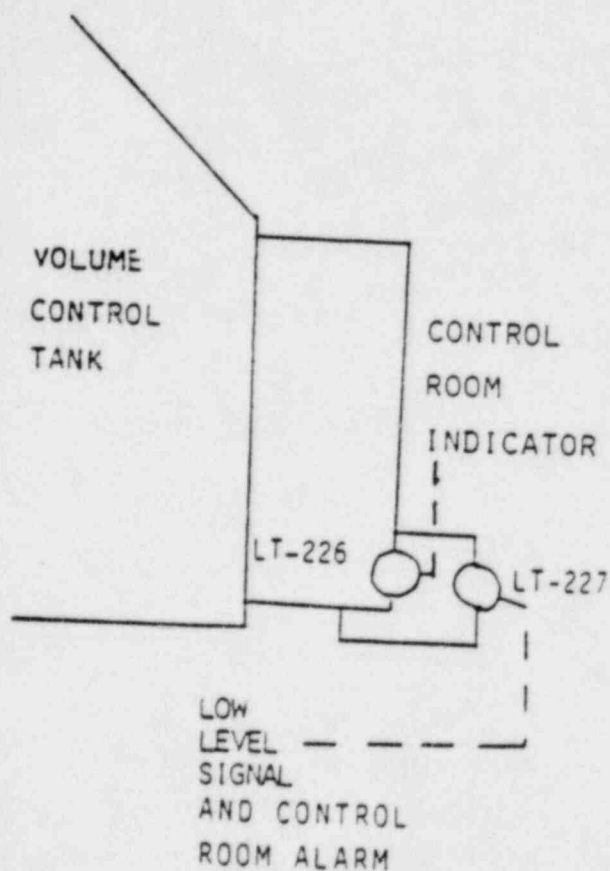
# VALVE POWER SUPPLY CHANGE



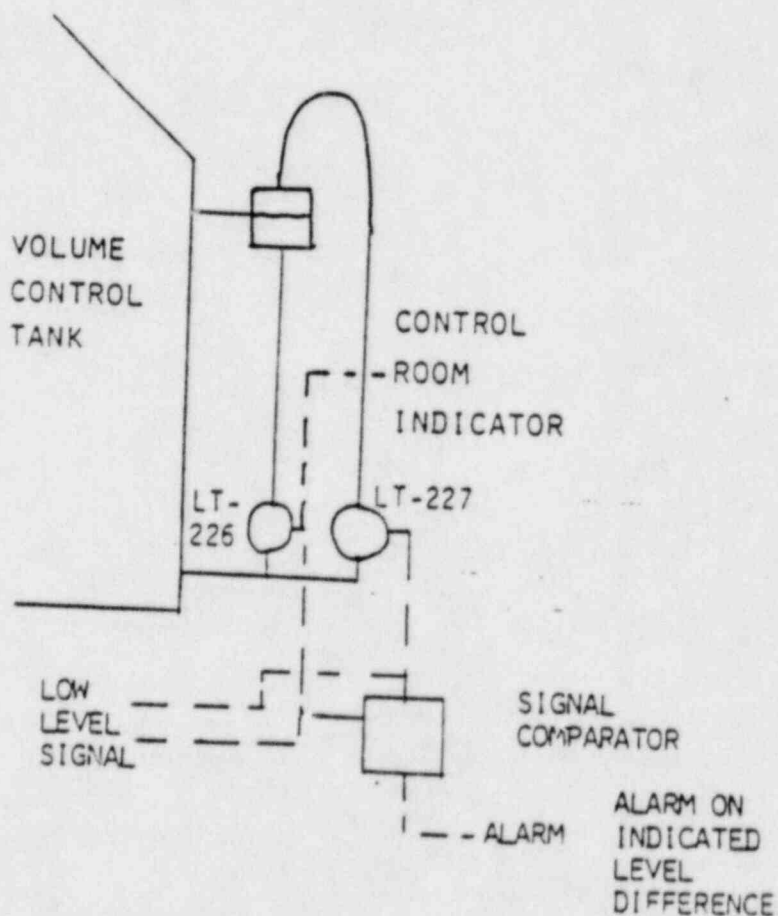
CHANGE ENSURES OPERABILITY FROM CONTROL ROOM AFTER SIAS AND LOP SUCH THAT SUCTION COULD BE ALIGNED TO RWT FROM VCI.

# VOLUME CONTROL TANK LEVEL INDICATION

## EXISTING

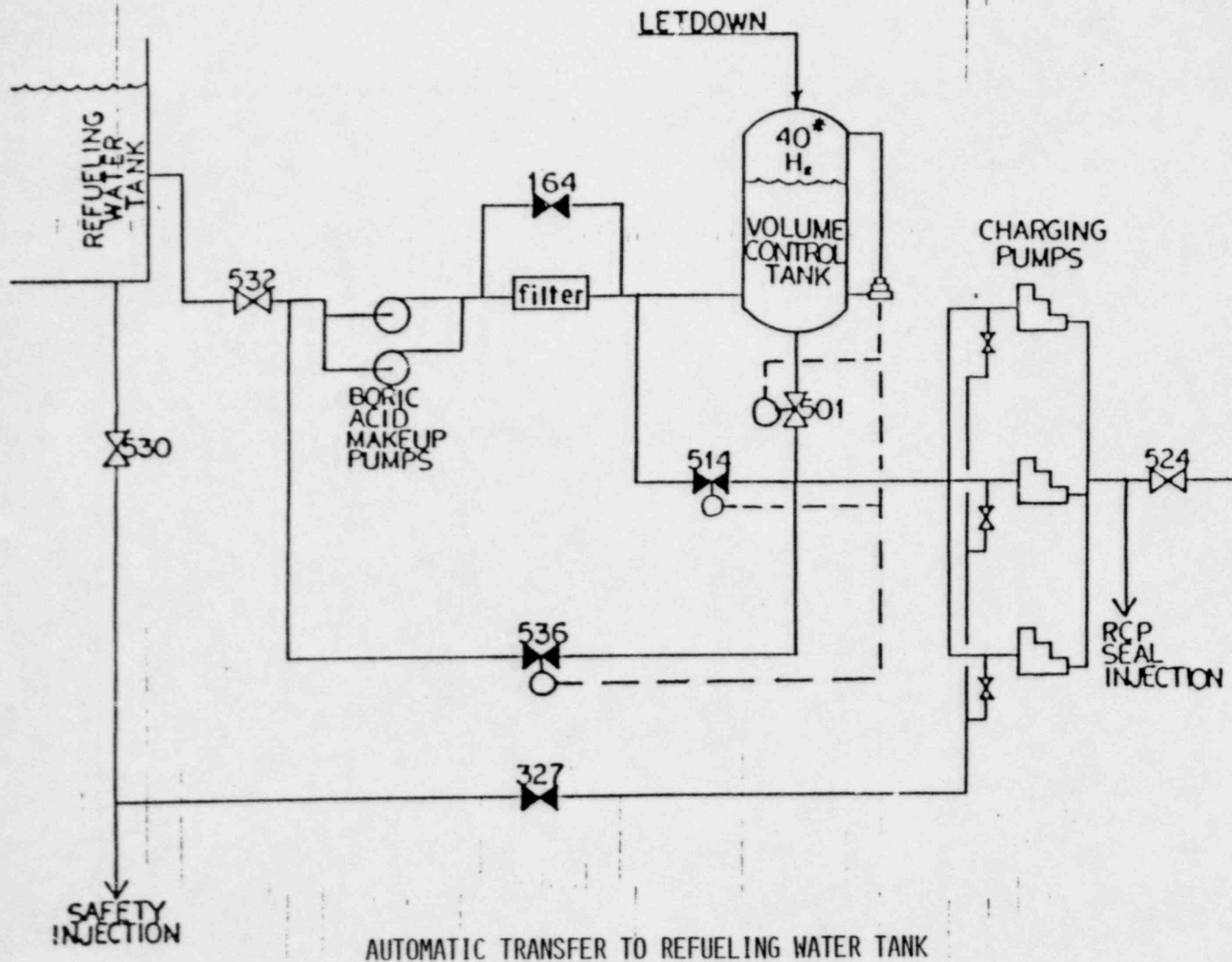


## MODIFIED



## IMPROVEMENTS

1. SEPERATE REFERENCE LEG TO EACH TRANSMITTER
2. ONE WET AND ONE DRY LEG TO PROVIDE DIVERSE REFERENCE
3. COMPARATOR ALARM PROVIDES INDICATION OF POSSIBLE LOSS OF CORRECT REFERENCE TO ONE OF THE TRANSMITTERS





### ENHANCEMENT EVALUATION

- o BORATED WATER SOURCE REMAINS AVAILABLE TO CONTROL ROOM OPERATOR FOLLOWING LOP AND SIAS
  
- o INACCURATE VCT LEVEL IS ALARMED IN CONTROL ROOM
  
- o OPERATOR WORK LOAD REDUCED BY AUTO TRANSFER OF V501 AND V536



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

OCT 2 1985

Docket Nos.: 50-528, 50-529,  
and 50-530

Mr. E. E. Van Brunt, Jr.  
Executive Vice President  
Arizona Nuclear Power Project  
Post Office Box 52034  
Phoenix, Arizona 85072-2034

Dear Mr. Van Brunt:

On September 12, 1985, Arizona Nuclear Power Project (ANPP) conducted a loss-of-load test on Palo Verde Nuclear Generating Station Unit 1 from approximately 55% power. The plant did not perform as expected. The test resulted in an event involving loss of all offsite power to non-essential loads (including the reactor coolant pumps), turbine trip and reactor trip. During the recovery phase of the event, overcooling of the reactor coolant system (RCS) occurred to the extent that the emergency core cooling systems were automatically initiated, followed by the associated automatic initiation of containment isolation.

The following two sequences occurred during the event that caused the loss of all three charging pumps:

- (1) When the safety injection actuation signal (SIAS) occurred, power to certain suction valves for the charging pumps was lost since the motor control center for these valves was classified as non-essential and, accordingly was designed to be automatically shed from the safety related electric buses.
- (2) Because of a malfunction of the single water level instrument channel for the volume control tank (VCT), automatic control action was lost which would have transferred the suction of the charging pumps from the VCT to other water sources. Also, after the containment isolation signal was received, all makeup flow to VCT was isolated.

Due to the above sequences, the VCT emptied, the charging pumps became bound on VCT hydrogen cover gas and the pumps were tripped. This produced a potentially hazardous situation when, to re-establish charging pump flow, the lines from the pumps were vented to remove gas.

One of the charging pumps is required to provide auxiliary spray to the pressurizer. In addition, the charging system may be needed to satisfy General Design Criteria (GDC) 26 and 33. To assure that specified acceptable fuel design limits are not exceeded, (1) GDC 26 requires that the plant design include a redundant reactivity control system (e.g., boron addition) and (2)

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GDC 33 requires that a system be provided to supply reactor coolant makeup for protection against small breaks in the reactor coolant pressure boundary (i.e., when the reactor coolant system is at operating pressure).

As a result of this event, the Region V Office of the NRC issued a Confirmatory Action Letter, dated September 17, 1985, confirming an ANPP commitment not to restart Palo Verde Unit 1 until the issue of appropriate design criteria for the auxiliary spray system was resolved to the satisfaction of the NRC staff. Your letter of September 18, 1985 discussed the September 12, 1985 event and briefly addressed concerns relating to the auxiliary spray system. At a meeting on September 20, 1985, your staff provided a more indepth discussion of the events and further discussed the auxiliary spray system.

At the conclusion of the September 20, 1985 meeting, ANPP committed to certain additional short term compensatory measures which justified continued operation of the facility while the long term corrective actions were developed. The staff found these compensatory measures sufficient to allow restart of Palo Verde Unit 1 pending the resolution of the design criteria issue for the auxiliary spray system. On the basis of your commitments to the agreed to compensatory measures, the Region V Office of the NRC issued a followup Confirmatory Action Letter, dated September 20, 1985, describing the commitments and stating that adequate short term compensatory measures are in place for restart of Palo Verde Unit 1. The letter also stated that long term measures to assure the reliability of the auxiliary spray system would be the subject of future correspondence.

In a November 3, 1982 letter, you stated that the safety-grade auxiliary spray system provides a depressurization capability of the primary system when the reactor coolant pumps are not running. In a July 28, 1983 letter, you stated that the safety grade auxiliary spray system is used to depressurize the plant to shutdown cooling entry conditions following a steam generator tube rupture (SGTR) accident without exceeding offsite dose limits. As discussed in NUREG-1044, "Evaluation of the Need for a Rapid Depressurization Capability for Combustion Engineering Plants", the staff's acceptance of the auxiliary spray system in lieu of PORVs was based on its understanding that the auxiliary spray system was safety grade.

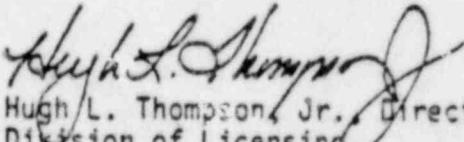
Because of the above considerations, we are concerned about the pressurizer auxiliary spray system for the following reasons and are requesting additional information as discussed in the enclosure:

- (1) The degree to which the design, installation and operational capabilities of the auxiliary spray system meets its licensing basis.
- (2) The Palo Verde accident analyses, in particular the SGTR analysis, takes credit for the auxiliary spray system.

- (3) The Palo Verde plant design also relies on the auxiliary spray system as a means of rapid depressurization of the primary system under certain accident scenarios since the plant does not include PORVs. Staff evaluation on the need for PORVs in the CE System 80 design was based on the understanding that a safety grade auxiliary spray system would be part of the design. In order for the staff's conclusion to remain valid, we require that the auxiliary spray system be highly reliable. Our original review equated this high reliability with meeting safety grade requirements.
- (4) The September 12, 1985 event demonstrated the operators' concern with getting the charging pumps operable.

Pursuant to 10 CFR 50.54(f), you are requested to furnish in writing, under oath or affirmation within 20 days of the date of this letter, your plans, program and schedule to bring the auxiliary spray system into conformance with the plant's licensing basis. Your submittal should address the resolution of the concerns identified above and respond to the specific questions in the enclosure. If you desire, we are prepared to meet with you to discuss your response when it is sufficiently developed to make such a meeting useful.

Sincerely,

  
Hugh L. Thompson, Jr., Director  
Division of Licensing  
Office of Nuclear Reactor Regulation

Enclosure: As stated

cc: See next page

ENCLOSURE

REQUEST FOR ADDITIONAL INFORMATION CONCERNING THE

SEPTEMBER 12, 1985 EVENT AT PALO VERDE UNIT 1

1. The Palo Verde design includes a safety grade auxiliary pressurizer spray system. As a result of the September 12, 1985 event at Palo Verde Unit 1, it is our view that the auxiliary pressurizer spray system does not meet safety grade standards and that the Palo Verde design is not consistent with the docketed information describing the system design. Therefore, describe the design modifications you intend to make to upgrade the auxiliary spray system to safety grade standards and provide the schedule by which this effort will be accomplished. A justification for operation until the modifications have been completed should be provided.
2. The auxiliary spray system was stated to be safety grade on the Palo Verde docket and then later determined to have single failure vulnerabilities and other deficiencies. Provide a detailed explanation of how the QA process, which should include an independent review and verification of design adequacy, did not detect these deficiencies in the auxiliary spray system. Also provide a description of the corrective actions you intend to take to remedy any weaknesses identified in the QA process.
3. Provide a detailed description of what you consider to be safety grade design requirements and how you apply these requirements to systems and components that are specified as safety related. In particular, discuss how these requirements were applied to the auxiliary spray system and whether the identified deficiencies in auxiliary spray system were due to a failure to apply them to the system.





UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION V

1450 MARIA LANE, SUITE 210  
WALNUT CREEK, CALIFORNIA 94596

SEP 20 1985

Docket No. 50-528  
License No. NPP-41

CONFIRMATORY ACTION LETTER

Arizona Nuclear Power Project  
Post Office Box 52034  
Phoenix, Arizona 85072-2034

Attention: Mr. E. E. Van Brunt, Jr.  
Executive Vice President

Subject: Return of Palo Verde 1 to Power Operations from Current Outage

Gentlemen:

In my letter to you of September 17, 1985, I confirmed Arizona Nuclear Power Project's (ANPP) agreement that prior to restart of the Unit from its current shutdown, you would ensure that the issue of appropriate design criteria for the auxiliary spray system was resolved to the satisfaction of the NRC staff.

By letter dated September 18, 1985, you discussed the unscheduled shutdown of September 12, 1985 and briefly addressed NRC concerns relating to the auxiliary spray system and interfacing equipment. In response to these concerns, you proposed certain short term compensatory measures for continued operation of the facility.

In a meeting with the NRC staff on September 20, 1985, you provided a more in-depth description of the September 12, 1985 event, including the sequence of events, design characteristics of the auxiliary spray system, and a further discussion of the short term compensatory measures for continued operation. At the conclusion of the meeting, Mr. J. Haynes, Vice President for Nuclear Production, ANPP, committed to the following short term compensatory measures:

- (1) Monitor the reference leg of the volume control tank level indicator on a daily basis. If the data obtained justify a less frequent monitoring interval, ANPP may propose a different interval to the NRC staff.
- (2) Revise the appropriate procedures to require alignment of the refueling water tank to charging pump suction promptly on loss of offsite power.
- (3) Institute procedural cautions on restart of the charging pumps.

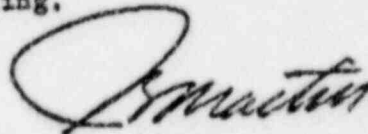
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- (4) Examine the post-trip review process in light of the September 12, 1985 event to assure that off-normal events are adequately evaluated, particularly with respect to their potential safety significance.
- (5) Examine the process for vendor reviews of the remaining power ascension tests to assure that, for equipment particularly sensitive to the test being conducted, appropriate vendor input has been provided in the test development.
- (6) Review the shift complement for the remaining power ascension tests to determine if additional staffing may be appropriate.

On the basis of the above commitments, we are satisfied that adequate short-term compensatory measures are in place for restart of the Unit from its current shutdown. Long term measures to assure the continued reliability of the auxiliary spray system will be the subject of future correspondence.

If our understanding concerning the above measures is not correct, you should promptly notify this office in writing.



J. B. Martin  
Regional Administrator

Distribution:  
Standard  
J. Axelrad, IE  
J. Lieberman, OELD

LOSS OF OFFSITE POWER EVENT

1. Vugraph from Staff meeting
2. Preliminary Notification Notice of Switchyard Distribution Malfunction (PNO-V-85-69) dated October 8, 1985.

PALO VERDE LOSS OF OFFSITE POWER  
OCTOBER 3, 1985 (J. T. BEARD, NRR)

- PROBLEM

- SIMULTANEOUS LOSS OF BOTH OFFSITE POWER CIRCUITS  
CAUSING PLANT TRIP
- LOSS OF SWITCHYARD INSTRUMENTATION
- LOSS OF CONTROL ROOM OPERATION OF SWITCHYARD  
BREAKERS

- SIGNIFICANCE

- EVENT MAY HAVE BEEN CAUSED BY MALFUNCTION  
OF A SINGLE COMMON MULTIPLEXING MONITOR SYSTEM;  
STILL UNDER INVESTIGATION

- CIRCUMSTANCES

- PLANT AT 82% POWER IN ABNORMAL ELECTRIC POWER  
CONFIGURATION (NO LOADS ON AUX. TRANSFORMER)
- SIMULTANEOUS LOSS OF BOTH S/U TRANSFORMERS
- EDGS AUTO STARTED, LOADED
- PLANT TRIP ON LOSS OF RCPs -- LO DNBR PROJECTION
- AFW AUTO STARTED, MAINTAINED PROPER S/G LEVEL
- SWITCHYARD MULTIPLEXER LOST; CAUSED LOSS OF  
INDICATIONS AND REMOTE CONTROL
- OFFSITE POWER RESTORED LOCALLY IN 24 MINUTES
- RE-START OF RCPs DELAYED BY RCP MOTOR LOCKOUTS ON  
MAIN GENERATOR COASTDOWN.

- FOLLOW-UP

- UTILITY STILL EVALUATING
- NRR/ORAB MONITORING

PRELIMINARY NOTIFICATION OF EVENT OR UNUSUAL OCCURRENCE--PNO-V-85-69  
Date: 10/08/85

This preliminary notification constitutes EARLY notice of POSSIBLE safety or public interest significance. The information presented is as initially received without verification or evaluation and is basically all that is known by Region V staff on this date.

FACILITY: Arizona Nuclear Power Project  
Palo Verde Unit 1  
Docket Nos. 50-528, 50-529  
Emergency Classification  
☒ Notification of Unusual Event  
☐ Alert  
☐ Site Area Emergency  
☐ General Emergency  
☐ Not Applicable

SUBJECT: SWITCHYARD ELECTRICAL DISTRIBUTION MALFUNCTION (PNO-V-85-68 UPDATE)

Following the October 3 loss of normal electric power the licensee initiated an investigation to determine the cause of the opening of the normal feeder breakers to the 13.8 KV busses (S05 and S06), located in the plant switchyard. Troubleshooting identified several problems associated with the plant multiplexer, which provides control and indication of the above breakers from the Control Room. On October 8 at 7:58 PM, with the plant in Hot Standby, a repeat loss of normal electric power was experienced shortly after replacing a microprocessor card in the Local Multiplexer Terminal. A reactor trip occurred (shutdown banks were withdrawn before the trip) following the loss of reactor coolant pumps. The diesel generators started and supplied the essential busses. An Unusual Event was declared at 8:03 PM, and was terminated at 8:44 PM following restoration of forced circulation and stable plant conditions. The licensee is currently proceeding with a design change to hard-wire control for the S05 and S06 normal and alternate feeder breakers in lieu of the existing multiplexer system. In the interim, the multiplexer has been disconnected from the trip coil for the S05 and S06 normal feeder breakers and alternate feeder breakers. The Resident Inspector responded to the October 3 event and continues to monitor the licensee activities including restart criteria. The licensee notified local media upon declaration of the Unusual Event.

This information is current as of 2:00 PM (MST) October 8, 1985.

CONTACT: R. Pate  
FTS 462-3868  
R. Zimmerman  
(602) 396-5260

C/R Distribution: Chm, Cnrs,  
PE, GC, CA, ACRS, Historian,  
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