

Arizona Public Service Company

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WILLIAM F. CONWAY
EXECUTIVE VICE PRESIDENT
NUCLEAR

102-02721/WFC/RAB/SAB
November 5, 1993

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-37
Washington, DC 20555

Dear Sirs:

**Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 2
Docket No. STN 50-529
Request for Amendment to Technical Specifications
Under Exigent Circumstances
File: 93-056-026**

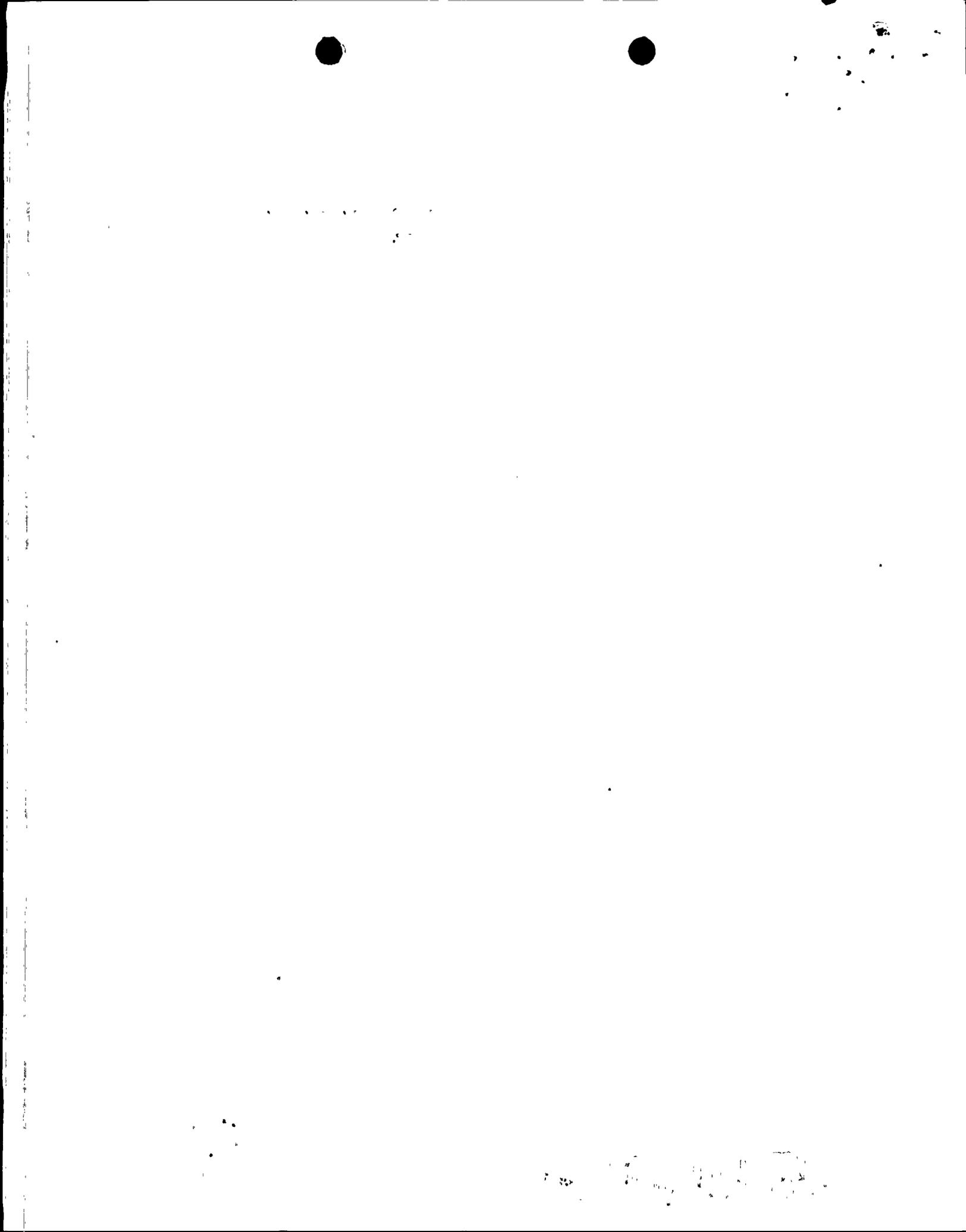
In accordance with 10 CFR 50.90, Application for amendment of license or construction permit, Arizona Public Service Company (APS) requests to amend the following PVNGS Unit 2 Technical Specifications' (TS) Limiting Conditions for Operation (LCO): 3.5.2 - Emergency Core Cooling System (ECCS), 3.6.2.1 - Containment Spray System (CSS), 3.7.1.2 - Auxiliary Feedwater System (AFS), 3.7.3 - Essential Cooling Water System (EWS), 3.7.6 - Essential Chilled Water System (ECS), and 3.7.11 - Shutdown Cooling System (SDCS) under exigent circumstances. The existing LCOs allow one train for each system to be inoperable for a maximum of 72 hours. An additional 72 hours is being requested for each train of these systems on a one-time per train basis to allow Unit 2 to complete sleeving of the EWS heat exchangers to prevent further tube leaks. The EWS is a required support system for the determination of operability of the aforementioned systems. The proposed amendment would allow each train of these systems to be inoperable for up to 72 hours beyond the current allowed outage time.

APS is making preparations to take the Train A and Train B heat exchangers out of service during the weeks of December 6 and November 29, 1993, respectively. Therefore, it is requested that this amendment be processed under exigent circumstances. Compensatory measures, as described in Enclosure 1 to this letter, will be taken during the extended outages of the heat exchangers.

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U. S. Nuclear Regulatory Commission
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Request for Amendment to Technical Specifications
Page 2

Enclosure 1 provides the following information in support of this amendment request:

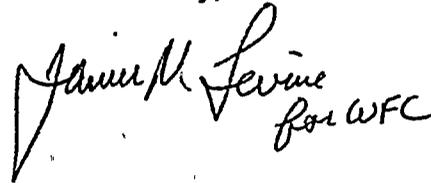
- A. Explanation of the Need for the Amendment and the Exigent Circumstances
- B. Description of the Existing Specifications and the Proposed Amendment
- C. No Significant Hazards Consideration Determination
- D. Compensatory Measures To Be Taken
- E. Environmental Impact Consideration

Enclosure 2 contains the marked-up TS pages for the proposed amendment.

By copy of this letter and enclosures, the Arizona Radiation Regulatory Agency is being notified of this request for a TS amendment, pursuant to 10 CFR 50.91(b)(1).

Should you have any questions, please contact Mr. Richard A. Bernier at (602) 393-5882.

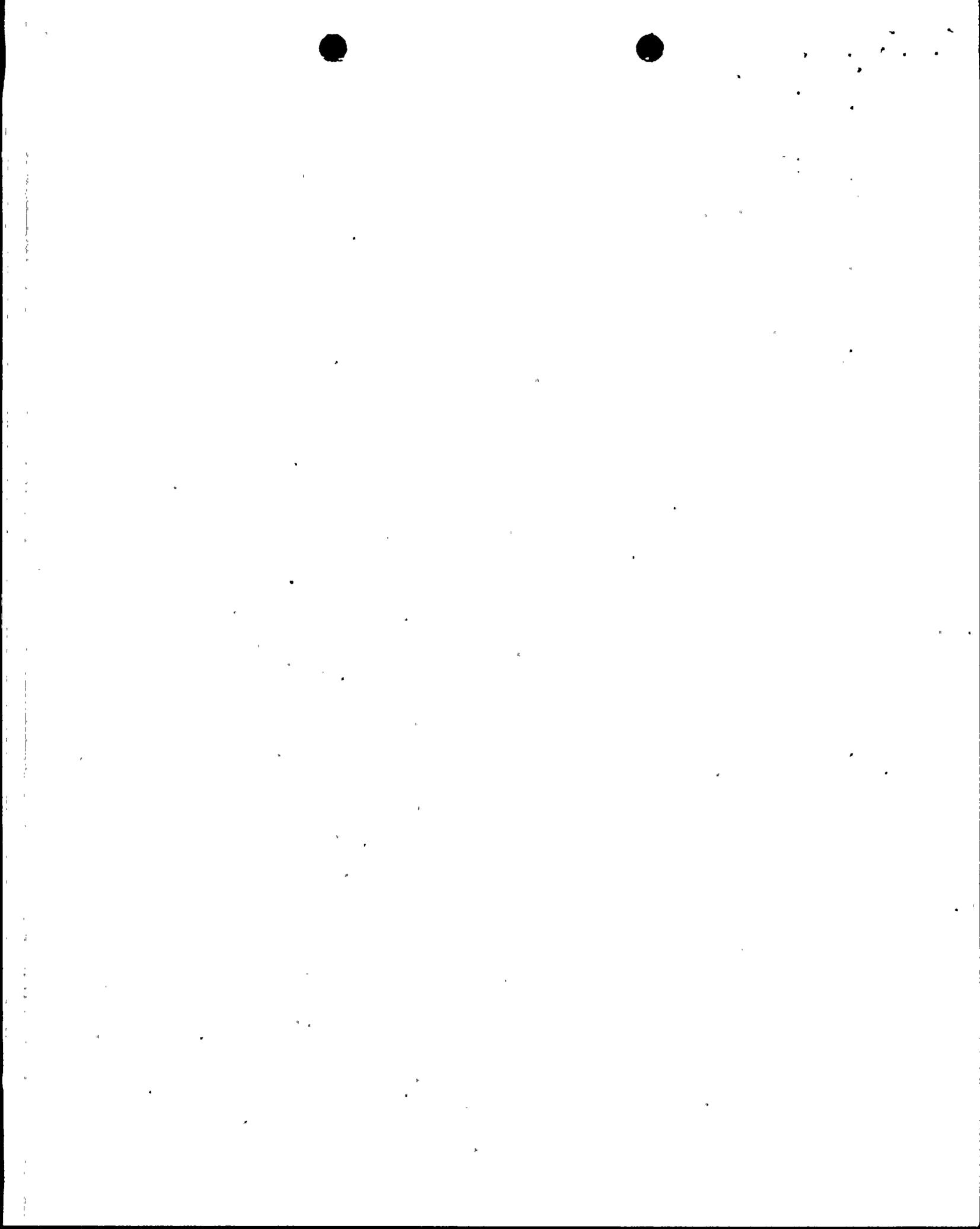
Sincerely,

A handwritten signature in cursive script that reads "James M. Levine" with "for WFC" written below it.

WFC/RAB/SAB/rv

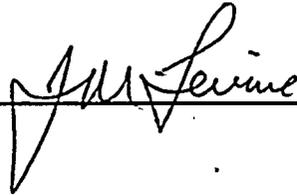
Enclosure

cc: B. H. Faulkenberry
B. H. Holian
J. A. Sloan



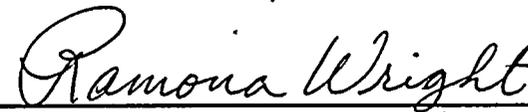
STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, J. M. Levine, represent that I am Vice President Nuclear Production, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true and correct.

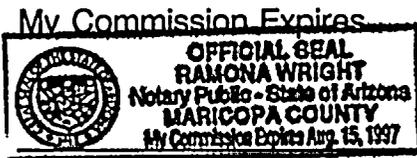


J. M. Levine

Sworn To Before Me This 5 Day Of November, 1993.

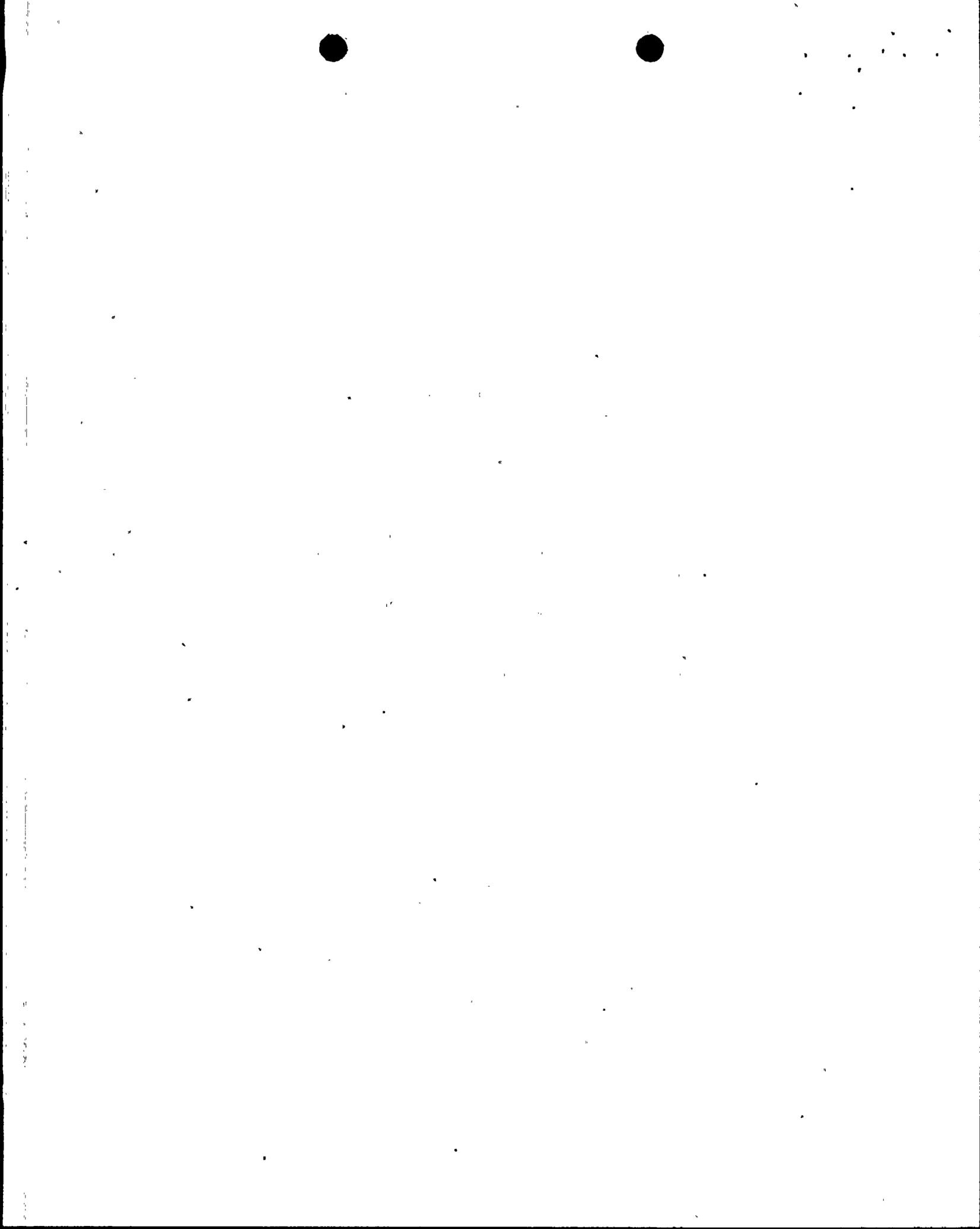


Notary Public



ENCLOSURE 1

**ARIZONA PUBLIC SERVICE COMPANY
REQUEST FOR TECHNICAL SPECIFICATION AMENDMENT**



**REQUEST FOR AMENDMENT OF TECHNICAL SPECIFICATION
LIMITING CONDITIONS FOR OPERATION
3.5.2, 3.6.2.1, 3.7.1.2, 3.7.3, 3.7.6 AND 3.7.11**

A. EXPLANATION OF THE NEED FOR THE AMENDMENT AND THE EXIGENT CIRCUMSTANCES

The Essential Cooling Water System (EWS) heat exchangers in Unit 2 of the Palo Verde Nuclear Generating Station (PVNGS) are tube and shell heat exchangers. These heat exchangers have experienced numerous tube leaks resulting in repeated outages of the cooling loops. Since March of 1992 these heat exchangers have required repairs on eight separate occasions. On four of these occasions, the Technical Specification Action Statement had to be entered and a temporary waiver of compliance was required on one occasion to complete the necessary repairs. From experience to date, cracks have progressed from non-detectable to through-wall in less than three months. To date, 130 tubes have been plugged in the Train A heat exchanger and 59 tubes have been plugged in the Train B heat exchanger. Eddy current examination of one heat exchanger in each of Units 1 and 3 has not identified the existence of the same problem.

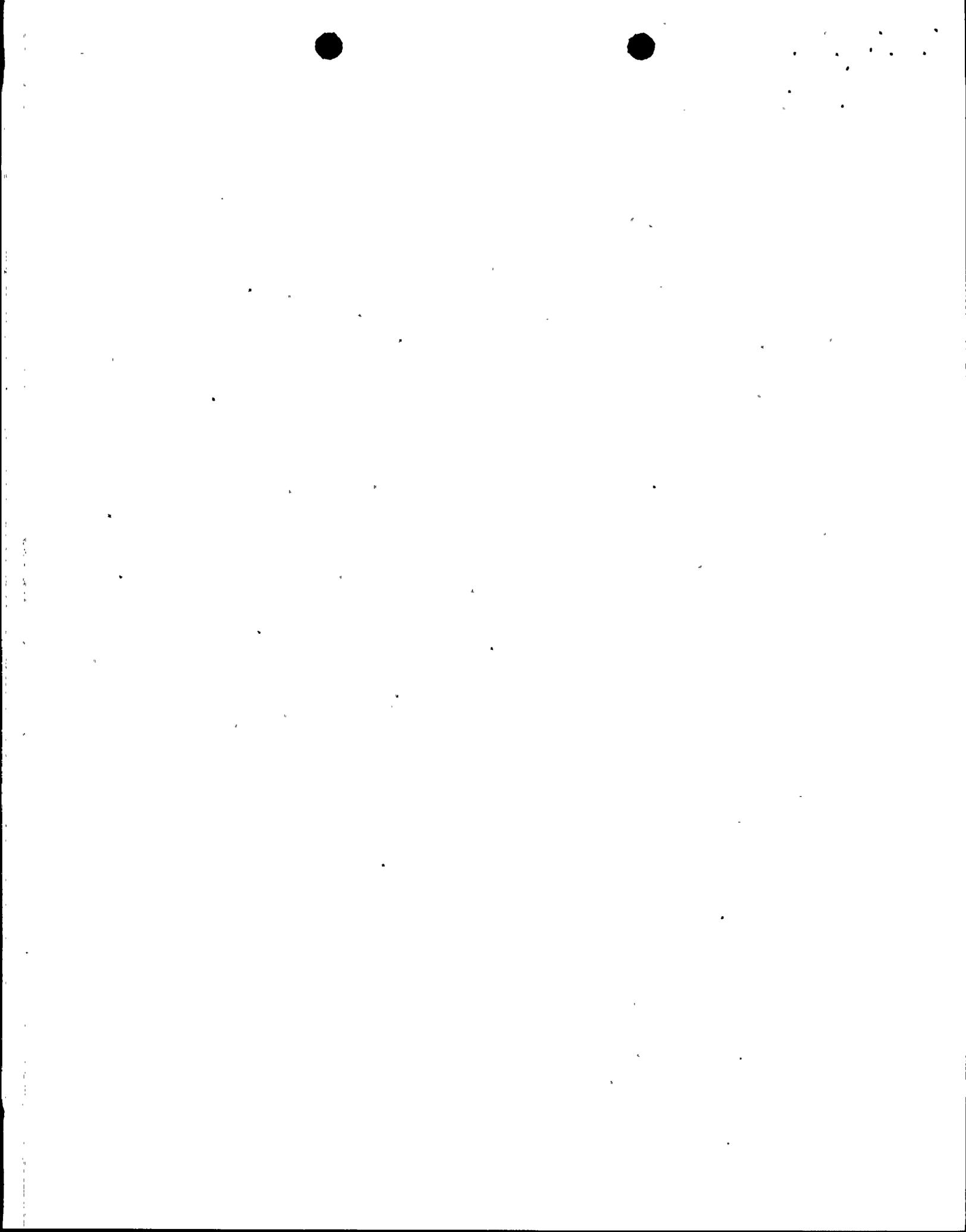
A root cause of failure evaluation was performed based on eddy current examinations of the tubes and tube samples removed from the heat exchangers and it was determined that the failures are the result of stress corrosion cracking in the roll transition portion of the tubes near each of the tube sheets. In order to eliminate the recurring tube failures, sleeves will be installed in all operational tubes in both the inlet and outlet of the heat exchangers.

The requested amendment would allow the repair modifications to be performed while the unit remains on line. Performing the modifications on line is justified for two primary reasons:

- 1) Based upon a Probabilistic Risk Assessment (PRA), the risk of performing the modifications while on line is significantly less than performing the modifications while in Modes 2 through 5, and
- 2) Performing the modifications during the upcoming mid-cycle outage would add 10 to 12 days to the length of the outage resulting in significant replacement power costs (approximately \$572,000 per day).

As such, Arizona Public Service Company (APS) is requesting approval of a one-time amendment to the PVNGS Technical Specifications (TS) to allow the heat exchanger modifications to be performed while the plant is operating.

The permanent repair of the EWS heat exchangers is necessary to eliminate the potential for further inoperability of a significant safety system. Performing the repairs prior to the upcoming mid-cycle outage is warranted because of the increased safety significance of



the EWS while shutdown. During the mid-cycle outage, the plant will be operated at mid-loop with a hot core for approximately 6 days for steam generator nozzle dam installation and removal. Ensuring a high degree of reliability of the EWS during that period warrants the performance of the sleeving prior to this condition in accordance with the proposed schedule.

The extension of the subject Limiting Conditions for Operation (LCOs) for up to 72 hours beyond the allowed outage time is necessary for completion of sleeving of both ends of the heat exchanger. This extension includes the time needed to remove the heat exchanger from service, perform the sleeving, conduct post-modification testing and restore the heat exchanger to service. The extension also includes a margin of 10 percent to account for unforeseen conditions or problems.

The amendment is being requested on an exigent basis because sufficient time does not exist to process the amendment under normal circumstances and still allow the necessary repairs to be made in advance of the mid-cycle outage in accordance with the established schedule. APS had originally proceeded to obtain the necessary extension of the TS allowed outage time under the provisions of 10 CFR Part 2, Appendix C for a Notice of Enforcement Discretion based, in part, on the use of a Temporary Waiver of Compliance for previous repairs. This approach was under discussion with the NRC for several weeks before APS was informed that a one-time TS amendment would be the appropriate vehicle for obtaining the needed relief. This decision was not made in time to support processing the amendment under normal circumstances. Because the modification improves plant safety, APS believes it is prudent to process the change under exigent circumstances.

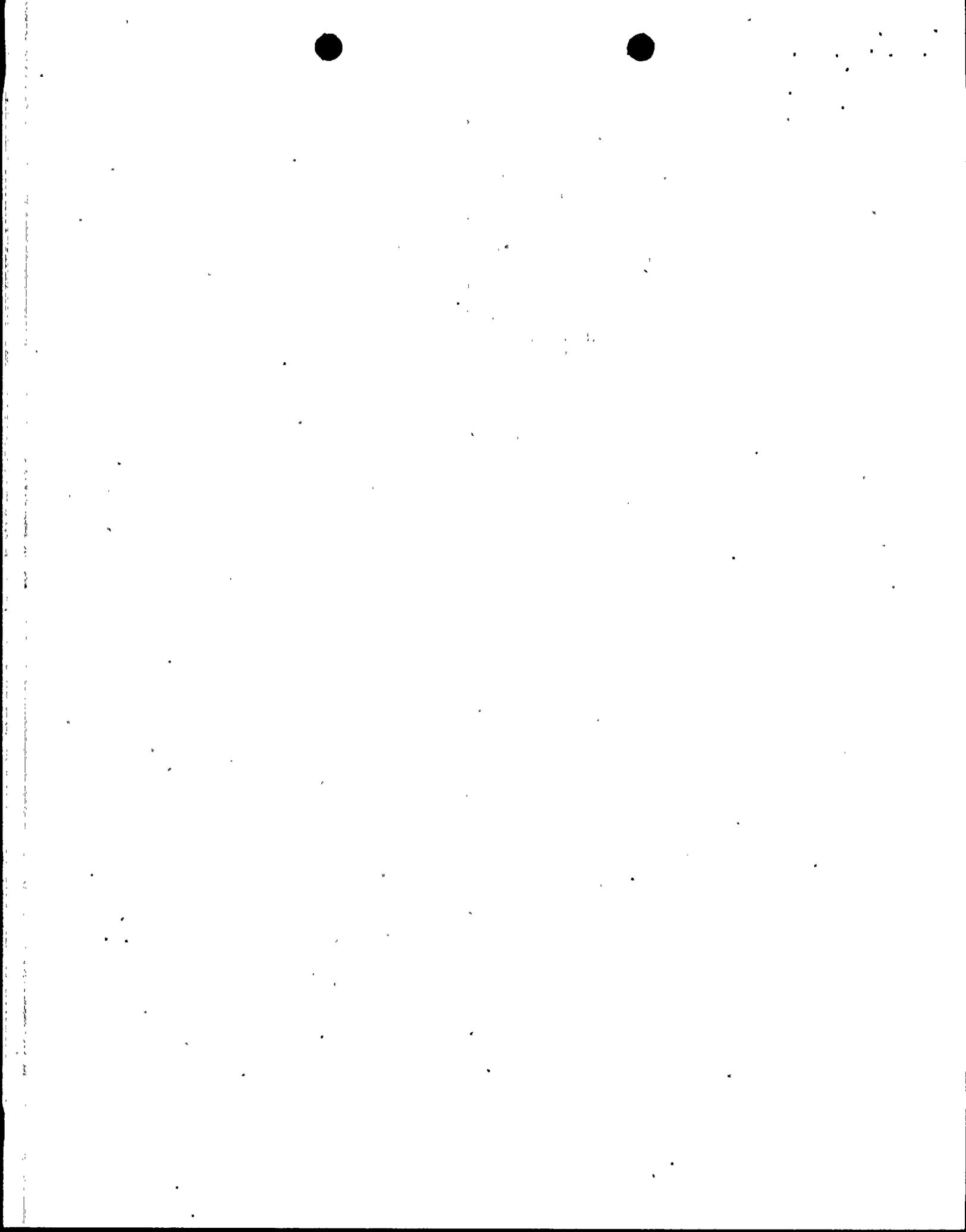
The proposed sleeving modifications are scheduled for the week of December 6, 1993, for the Train A heat exchanger and the week of November 29, 1993, for the B Train heat exchanger. As such, approval of this amendment is requested to support this schedule.

B. DESCRIPTION OF THE EXISTING TECHNICAL SPECIFICATIONS AND THE PROPOSED AMENDMENT

Limiting Condition for Operation 3.5.2; Emergency Core Cooling System

LCO 3.5.2 specifies that at least two Emergency Core Cooling System (ECCS) subsystems shall be operable while in Modes 1, 2, and 3. With one ECCS subsystem inoperable, action is required to restore at least two subsystems to operable status within 72 hours or be in at least hot standby within the next 6 hours and in hot shutdown within the following 6 hours.

The operability of two separate and independent ECCS subsystems, with the reactor coolant system (RCS) temperature greater than or equal to 350 °F, ensures that sufficient emergency core cooling capability will be available in the event of a loss of coolant accident (LOCA) assuming loss of one subsystem through any single failure



consideration. Either subsystem operating in conjunction with the safety injection tanks is capable of supplying sufficient core cooling. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

Arizona Public Service Company (APS) requests a one-time amendment for each train of the ECCS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the ECCS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time due to the inoperability of essential room cooling capability. An amendment to LCO 3.5.2 is required to support the proposed sleeving modification.

Limiting Condition for Operation 3.6.2.1; Containment Spray System

LCO 3.6.2.1 specifies that at least two independent Containment Spray Systems (CSS) shall be operable during Modes 1, 2, 3, and 4. With one CSS inoperable, action is required to restore the inoperable spray system to operable status within 72 hours or be in at least hot standby within the next 6 hours; restore the inoperable spray system to operable status within the next 48 hours or be in cold shutdown within the following 30 hours.

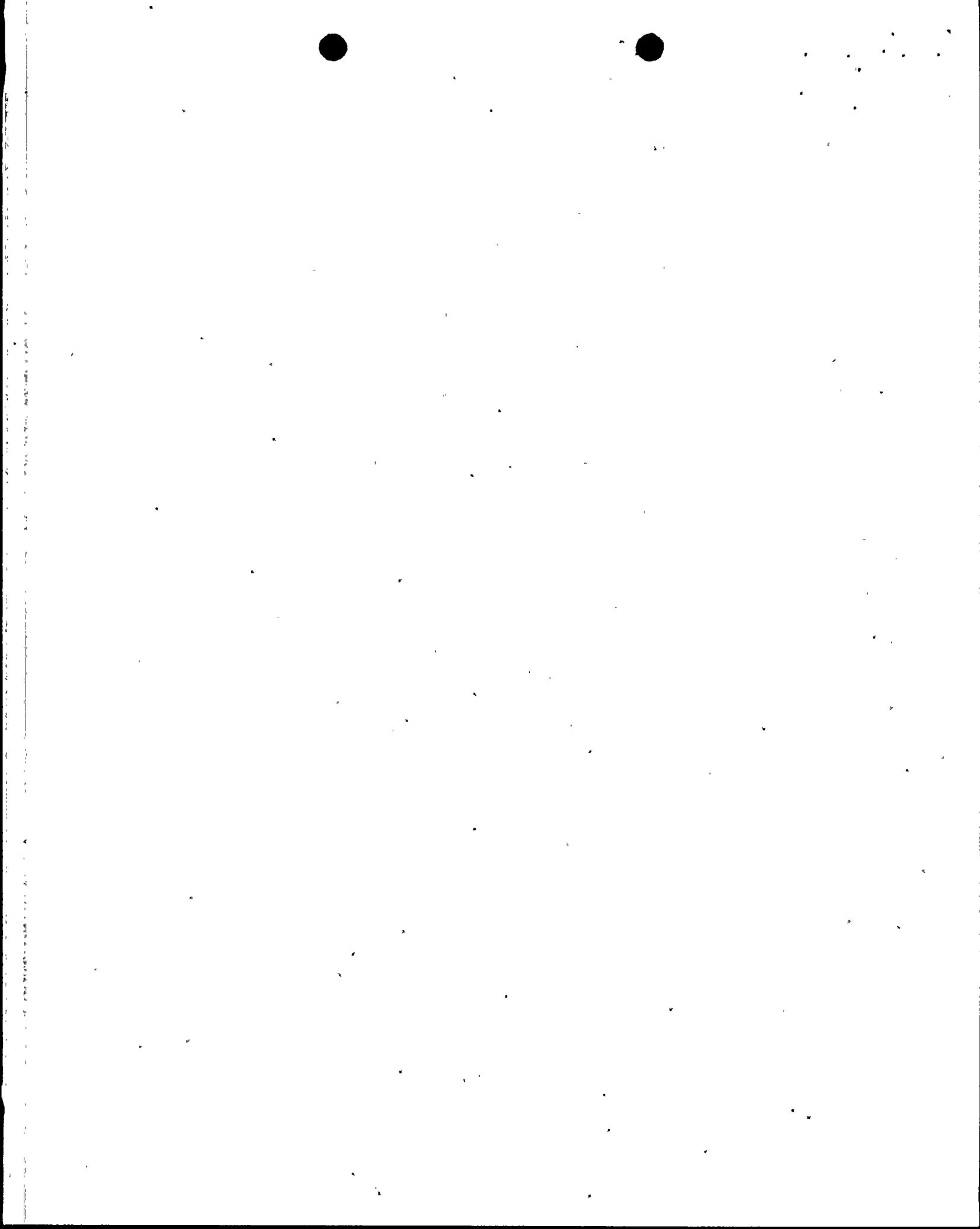
The operability of the CSS ensures that containment depressurization and cooling capability will be available in the event of a loss of coolant accident. The CSS and the containment cooling system are redundant to each other in providing post-accident cooling of the containment atmosphere. The CSS also provides a mechanism for removing iodine from the containment atmosphere.

APS requests a one-time amendment for each train of the CSS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the CSS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time. An amendment to LCO 3.6.2.1 is required to support the proposed sleeving modification.

Limiting Condition for Operation 3.7.1.2; Auxiliary Feedwater System

LCO 3.7.1.2 specifies that at least three independent steam generator auxiliary feedwater pumps in the Auxiliary Feedwater System (AFS) and associated flow paths shall be operable during Modes 1, 2, 3, and 4. With one AFS pump inoperable, action is required to restore the required auxiliary feedwater pumps to operable status within 72 hours or be in at least hot standby within the next 6 hours and in hot shutdown within the following 6 hours.

The operability of the AFS ensures that the RCS can be cooled down to less than 350 °F from normal operating conditions in the event of a total loss of offsite power.



APS requests a one-time amendment for each train of the AFS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the AFS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time due to the inoperability of essential room cooling capability. An amendment to LCO 3.7.1.2 is required to support the proposed sleeving modification.

Limiting Condition for Operation 3.7.3; Essential Cooling Water System

LCO 3.7.3 specifies that at least two independent EWS loops shall be operable while in Modes 1, 2, 3, and 4. With only one EWS loop operable, action is required to restore at least two loops to operable status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

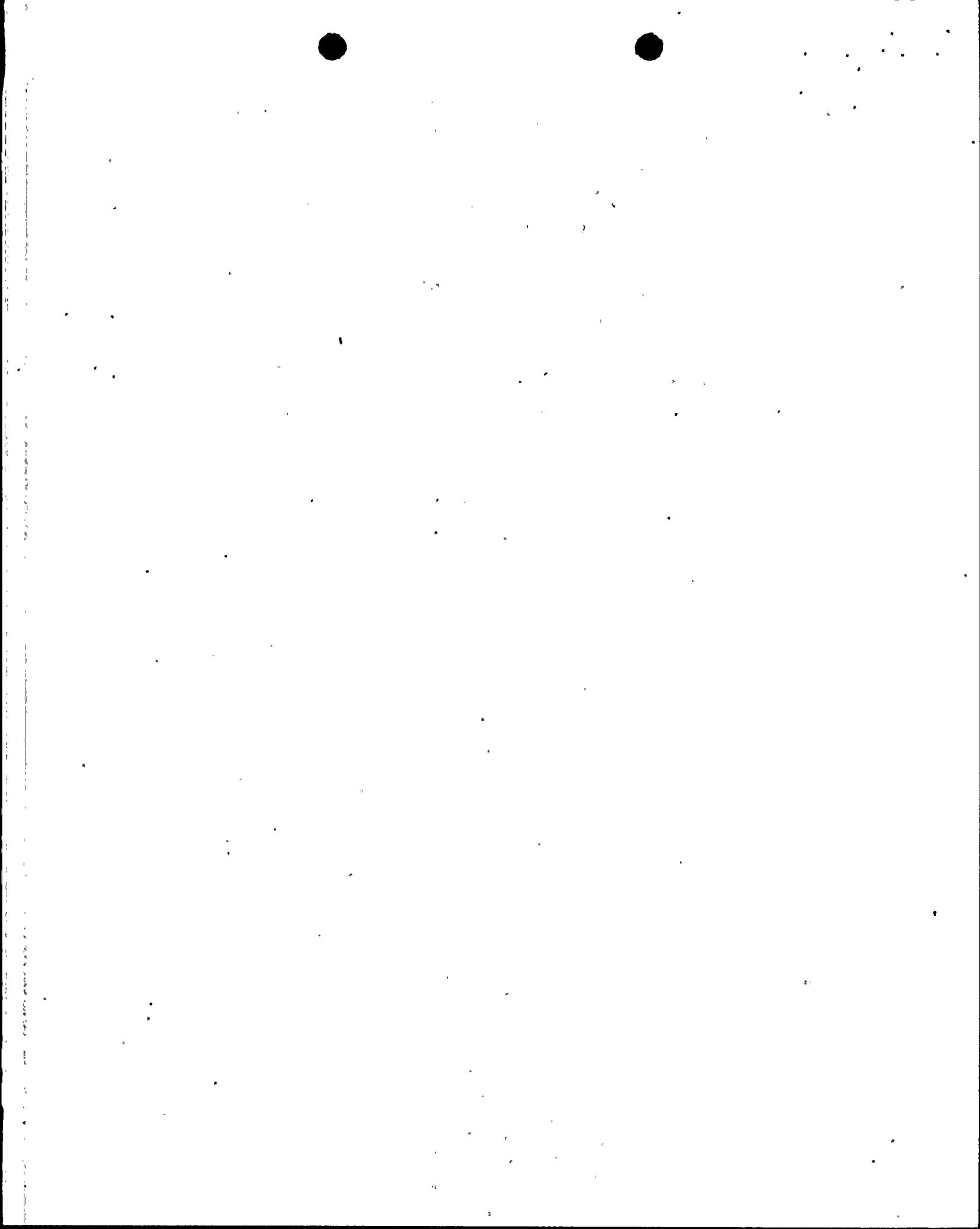
The operability of the EWS ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The design of the system includes two separate, independent, redundant, closed loop, safety-related trains. Either train of the EWS is capable of supporting 100 percent of the cooling functions required for a safe reactor shutdown or following a loss of coolant accident.

APS requests a one-time amendment for each train of the EWS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the EWS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time. An amendment to LCO 3.7.3 is required to support the proposed sleeving modification.

Limiting Condition for Operation 3.7.6; Essential Chilled Water System

LCO 3.7.6 specifies that at least two independent Essential Chilled Water System (ECS) loops shall be operable while in Modes 1, 2, 3, and 4. With only one essential chilled water loop operable, action is required to restore at least two loops to operable status within 72 hours or be in at least hot standby within the next 6 hours and in cold shutdown within the following 30 hours.

The operability of the essential chilled water system insures that sufficient cooling capacity is available for continued operation of equipment and control room habitability during accident conditions. Either train of the essential cooling water system is capable of providing the necessary cooling capacity required of this system. The ECS in conjunction with respective emergency heating, ventilation and air conditioning (HVAC) units, provides heat removal to maintain the various Engineered Safety Features (ESF) room design temperatures below the associated equipment qualification limits.



APS requests a one-time amendment for each train of the ECS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the ECS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time. An amendment to LCO 3.7.6 is required to support the proposed sleeving modification.

Limiting Condition for Operation 3.7.11; Shutdown Cooling System

LCO 3.7.11 specifies that at least two independent Shutdown Cooling Systems (SDCS) shall be operable, with one operable low pressure safety injection pump, and an independent operable flow path capable of taking suction from the Reactor Coolant System (RCS) hot leg and discharging coolant through the shutdown cooling heat exchanger and back to the RCS through the cold leg injection lines during Modes 1, 2, and 3. With one SDCS inoperable, action is required to restore the inoperable subsystem to operable status within 72 hours or be in at least hot standby within 1 hour and be in at least hot shutdown within the next 6 hours and in cold shutdown within the following 30 hours.

The operability of two separate and independent shutdown cooling subsystems ensures that the capability of initiating shutdown cooling in the event of an accident exists even assuming the most limiting single failure. The shutdown cooling system is one means of providing long-term post-accident reactor cooling. One shutdown cooling subsystem, capable of supporting the entire heat load, would be initiated during the accident recovery period with the RCS temperature less than 350 °F.

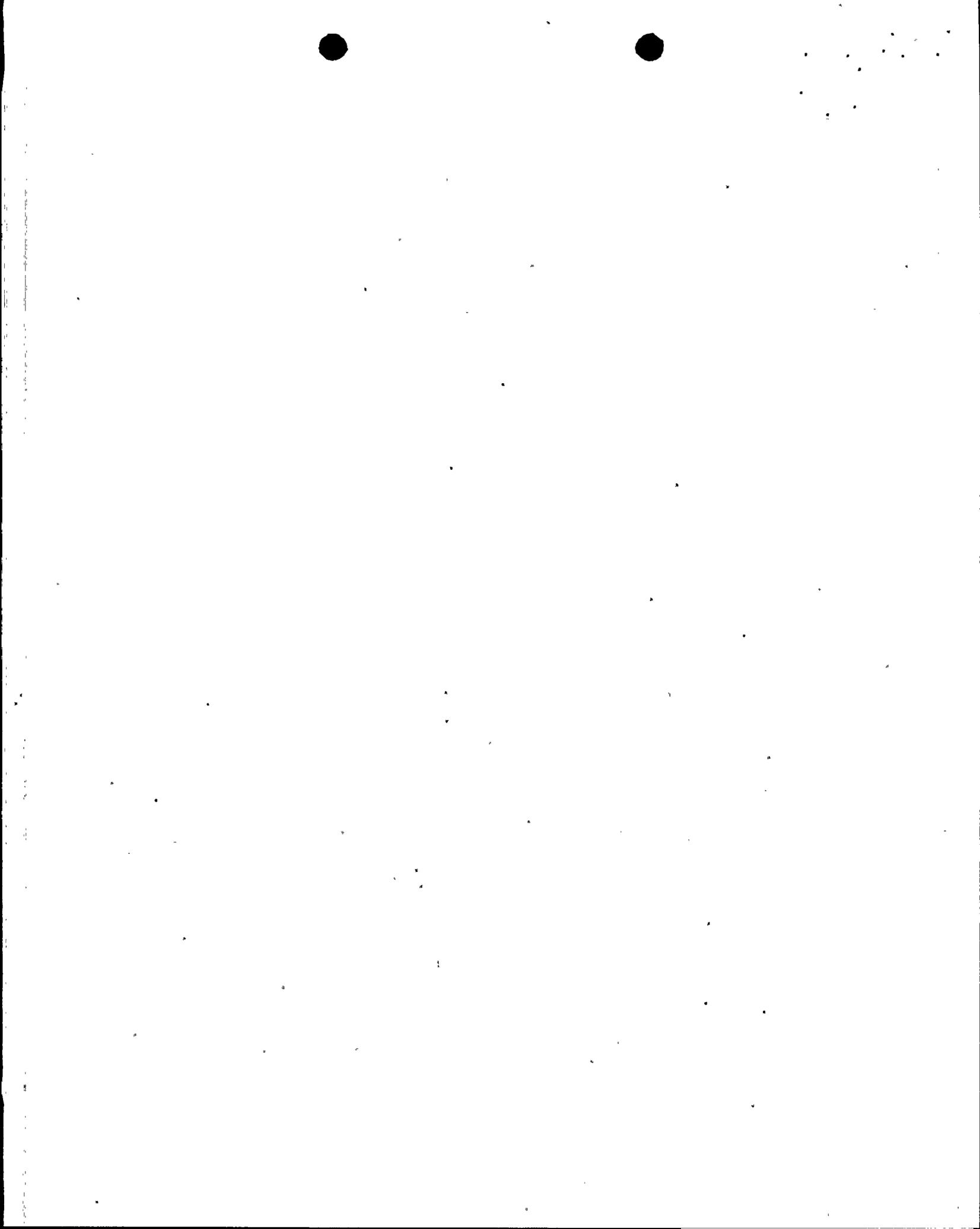
APS requests a one-time amendment for each train of the SDCS to extend the allowed outage time for a single train from 72 hours to 144 hours. APS' proposed sleeving modification to the EWS heat exchangers will render each train of the SDCS inoperable on separate occasions for up to 72 hours beyond the current allowed outage time. An amendment to LCO 3.7.11 is required to support the proposed sleeving modification.

C. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

In accordance with the requirements of 10 CFR 50.92, this license amendment request involves no significant hazards considerations based on the following:

Standard 1- Does the proposed license amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

During normal plant operation, the EWS, ECCS, CSS, AFS, SDCS, and ECS are not operating. The redundancy of these systems allows testing of one train of each system without a loss of the safety function of the system. When one train of the EWS is taken out of service and the 72 hour action statement is entered, the action statements for the



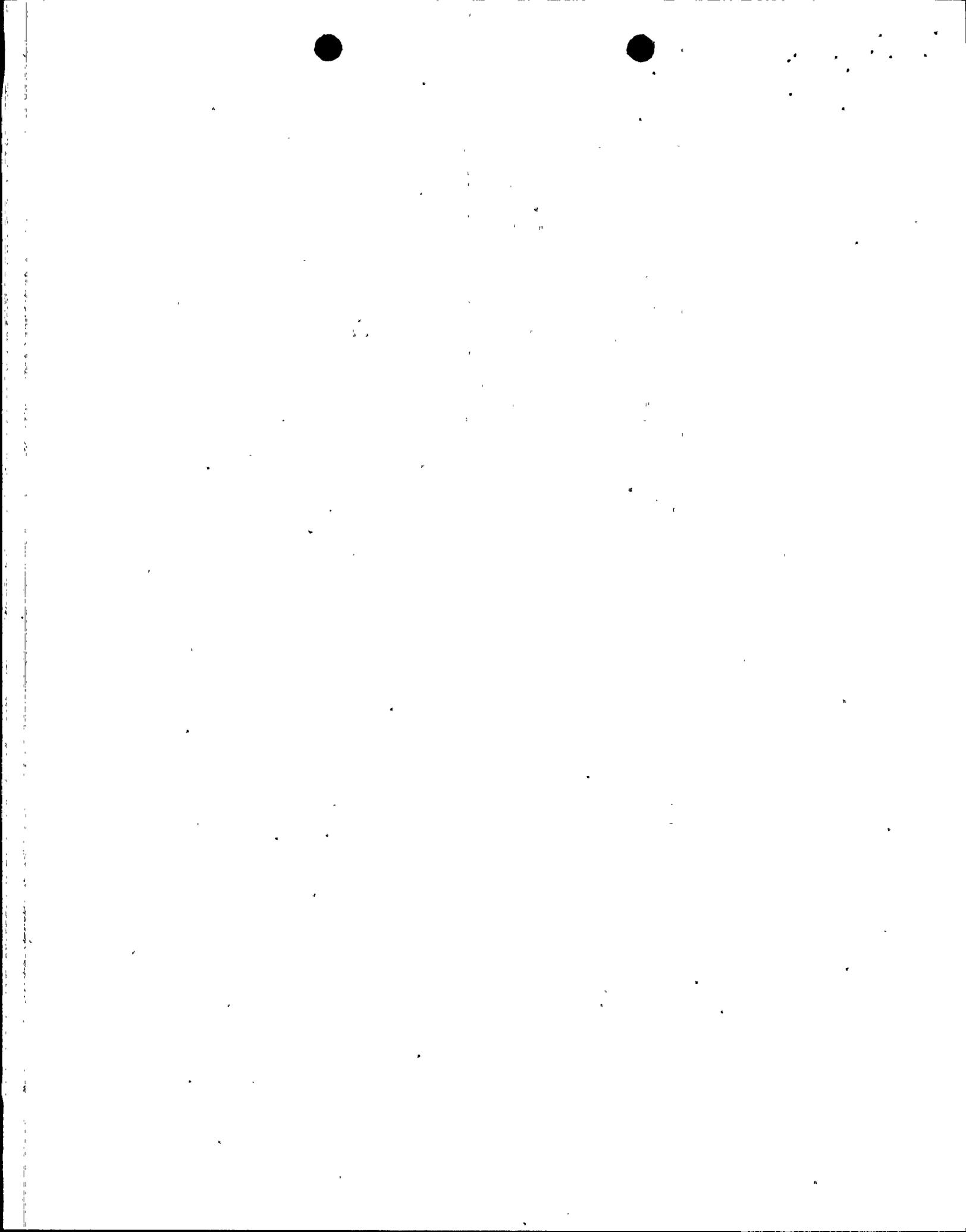
other systems must be entered since these systems are operable only if the necessary support systems are operable.

The allowed outage times for the Technical Specifications are based upon an acceptable probability that a single failure will not occur simultaneously with an accident while system redundancy is lost. Therefore, in order to demonstrate that the proposed increase in the allowed outage time does not involve a significant increase in the probability of an accident previously evaluated, a PRA was performed to determine the impact on Core Damage Probability (CDP) associated with the proposed one-time extension of the EWS LCO allowed outage time. This analysis determined that the CDP for the extended allowed outage time for Train A of the EWS is $3E-6$ and $7E-6$ for Train B. Based on these CDPs, the risk associated with the proposed extended outages of the EWS heat exchangers on a one-time basis is deemed to be acceptable and the proposed amendment does not involve a significant increase in the probability of an accident previously evaluated.

These CDPs can be compared to the accepted increased risk associated with removing the Train A Auxiliary Feedwater pump from service for the Technical Specification-allowed outage time of 72 hours of $1E-5$. Since the risk associated with removing the Auxiliary Feedwater pump from service for the approved action statement time of 72 hours is acceptable and is greater than the risk associated with the proposed extended outages of the EWS heat exchangers, the risk associated with the proposed outages of the EWS trains on a one-time basis is deemed to be acceptable.

The PRA also evaluated the option of performing the proposed sleeving modification during plant shutdown (Mode 5). This analysis assumed that other equipment was not removed from service to perform elective maintenance during the time period in which the EWS heat exchanger was out of service. This analysis yielded CDPs of $2E-3$ for each train of the EWS. This result clearly indicates that the increased risk associated with the proposed modification is much higher during Mode 5. A comparative assessment concluded that the risk of performing the proposed modification in Modes 2, 3, or, 4 is comparable to the risk of performing the modification in Mode 5.

The PRA analysis assumes that all trains of Auxiliary Feedwater, offsite power, Emergency Diesel Generators and Essential Spray Ponds, remain functional and will not be removed from service to perform elective maintenance while either EWS heat exchanger is out of service. During normal operation, cooling to Train A and B component spaces is provided by the normal chilled water system (a non-safety-related system not affected by the outage of the EWS). Essential chilled water is utilized to maintain essential equipment room temperatures below the equipment qualification temperature when the ESF pumps are running, or when normal chilled water is lost (e.g., following a loss of offsite power). For non-LOCA scenarios, the critical spaces requiring cooling are the DC equipment rooms and the AFS pump rooms. However, engineering analyses performed to support the Palo Verde PRA indicate that these room temperatures would not increase to the point where essential equipment would be expected to fail for a period of 12 hours following a total loss of chilled water (normal and essential). These analyses are



conservative for the current seasonal temperatures at PVNGS. Additionally, these room temperature limits would not be exceeded in cases where normal chilled water remains available. The PRA results discussed above indicate that the probability of a sustained loss of normal chilled water during the proposed EWS heat exchanger outage windows, concurrent with failures in the opposite train which would result in core damage is acceptably small as quantified above.

If an event were to occur requiring operation of shutdown cooling, an alternate means is available if the Low Pressure Safety Injection (LPSI) and CSS pumps become unavailable in the operable train. The SDCS pumps (CSS or LPSI) from the inoperable train can be cross-connected to use the operable train's SDCS heat exchanger. This lineup is described in PVNGS procedure 42AO-2ZZ22, "Loss of Shutdown Cooling." Flow through the cross-connect is adequate to remove decay heat loads existing when it would become necessary to continue the cooldown via the SDCS.

If neither train of EWS is available for performing SDCS functions, the Nuclear Cooling Water System (NCWS) is available and can be cross-connected to the desired EWS train to provide a heat sink for shutdown cooling. Additionally, if the above alternate method fails, the EWS trains could be cross-connected through the common NCWS connection using the operable EWS pump. These flow paths would only be used as a last resort as they are not analyzed or contained in procedures; however, they involve relatively simple valve alignments which can be accomplished under the direction of qualified, licensed personnel.

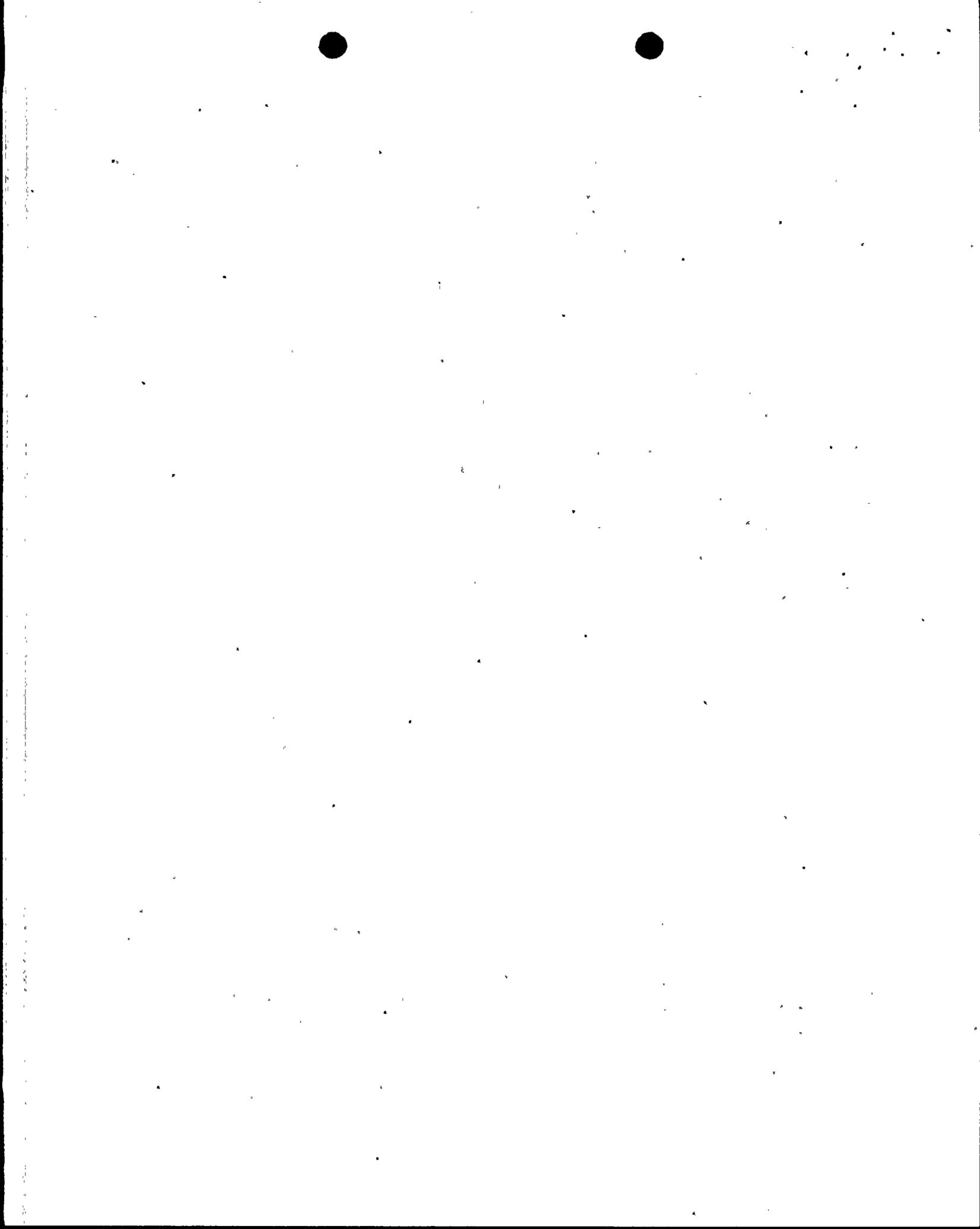
The proposed amendment only impacts the time allowed for the safety trains to be inoperable and does not change the equipment which is allowed to be inoperable. Therefore, the proposed license amendment does not involve a significant increase in the consequences of an accident previously evaluated.

Standard 2- Does the proposed license amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Increasing the allowed out-of-service time of the aforementioned LCOs for an additional 72 hours on a one-time only basis for the purpose of completing sleeving modifications does not create the possibility of a new or different kind of accident from any accident previously evaluated. No new accident scenarios are created by extending the allowed outage time of the subject safety systems.

Standard 3- Does the proposed license amendment involve a significant reduction in a margin of safety?

Extension of the allowed outage time does not involve a significant reduction in a margin of safety because there are no new or common failure modes being created by the extension. The performance of the associated safety systems will not be degraded by the extended out-of-service time.



D. COMPENSATORY MEASURES TO BE TAKEN

Unit 2 Operations will maintain operability of the Essential Spray Pond System and Emergency Diesel Generator in the affected train while in these LCO action statements. Additionally, the affected AFS train will remain functional. Prior to the commencement of work, safe-shutdown components in the operable train and the non-essential Auxiliary Feedwater Pump will be verified to be operable through a review of plant documentation. These components will be maintained fully operable during the extended allowed outage time and no routine work will be performed on these components while in the LCO action statements.

The requirements of Action b. of Technical Specification LCO 3.7.6 for the operable train of ECS, will be performed prior to removing the opposite train EWS heat exchanger from service. Upon positive verification that the normal HVAC system is providing space cooling to the vital power distribution rooms that depend on the inoperable train of the ECS in accordance with Action b.1, no further cascading of the Unit 2 Technical Specifications will be performed (i.e., the 2-hour action statement of LCO 3.8.2.1 for loss of direct current sources will not be applied once the normal HVAC system is verified).

Switchyard (525 kV and startup yards) activities are normally performed under the cognizance and direction of the Unit 1 Shift Supervisor. Temporary instructions will be provided to the Unit 1 control room to direct that offsite power supplies to Unit 2 should not be interrupted while the sleeving modification is being performed. APS and Salt River Project responsible control centers will be notified of the work being performed in Unit 2 in order that appropriate precautions may be taken for the outside distribution system. All maintenance activities in the switchyard and in the vicinity of the Unit 2 incoming lines and associated 13.8 kV buses (NAN-SO3/5, NAN-SO4/6) will be suspended. No other work will be performed or vehicular access allowed in the switchyard without specific review and approval by the Unit 1 Shift Supervisor and the Unit 2 Plant Manager. Any emergent work in the switchyard will be evaluated for potential affect on the supply of offsite power to Unit 2 and will only be conducted if authorized by the Unit 2 Plant Manager.

E. ENVIRONMENTAL IMPACT DETERMINATION

APS has determined that the proposed amendment involves no change in the amount or type of effluent that may be released offsite, and that there is no increase in individual or cumulative occupational radiation exposure. As such, operation of PVNGS Unit 2 in accordance with the proposed amendment, does not involve an unreviewed environmental safety question.

