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 AUTH. NAME AUTHOR AFFILIATION
 CONWAY, W.F. Arizona Public Service Co. (formerly Arizona Nuclear Power
 RECIP. NAME RECIPIENT AFFILIATION
 MARTIN, J.B. Region 5 (Post 820201)

SUBJECT: Forwards info provided to INPO re two major contributors to
 core damage frequency in PRA discovered during individual
 plant exams per Generic Ltr 88-20. Plant change requests
 initiated to address reduction in transient effects.

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WILLIAM F. CONWAY
EXECUTIVE VICE PRESIDENT
NUCLEAR

April 2, 1991

Mr. John B. Martin
Region V Regional Administrator
U. S. Nuclear Regulatory Commission
1450 Maria Lane, Suite 210
Walnut Creek, California 94596-5368.

Dear Mr. Martin:

Enclosed is a copy of the information we provided INPO so that it could be transmitted via their information network.

I indicated we would do so during the meeting with you and members of your staff on March 15, 1991.

Sincerely,



WFC/lbs

Enclosure

9104160376 910402
PDR ADOCK 05000528
P. PDR

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12-01

SUBJECT: PROBABLISTIC RISK ASSESSMENT IDENTIFIED TWO MAJOR
CONTRIBUTORS TO CORE DAMAGE FREQUENCY

PLANT : PALO VERDE 1, 2, & 3 (PWR/CEs) EVENT DATE : N/A
SOURCE : ARIZONA PUBLIC SERVICE CO. LOG# : OE 4476

EVENT:

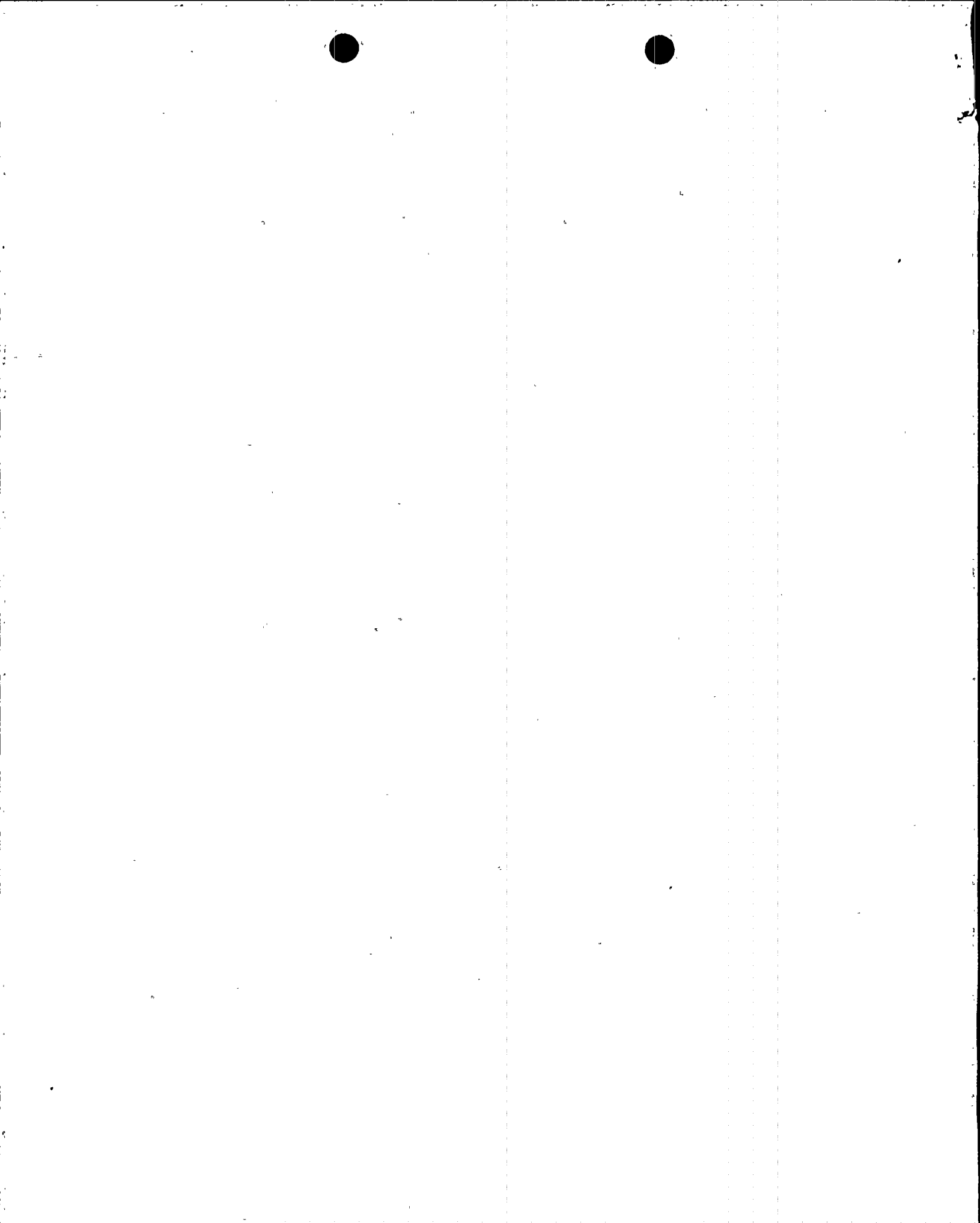
During the performance of our Individual Plant Examination (IPE), per Generic Letter 88-20, Palo Verde Nuclear Generating Station's Probablistic Risk Assessment (PRA) identified two major contributors to core damage frequency (CDF). The combined CDF for these two events without taking credit for operator recovery is 8×10^{-4} /Rx year. The two initiating events resulting in the CDF contributions are: Loss of Class 1E DC Control Power Channel 'A', and Loss of Ventilation (cooling) to the Class 1E DC equipment rooms. The high CDF results from both the potential transient impact on the plant and the loss of the plant's capability to mitigate the transient effects.

The design of the Main Steam and Feedwater Isolation valves at Palo Verde is configured to actuate closed when a single channel of DC control power is lost. This results in a simultaneous load rejection and loss of feedwater.

The plant's ability to mitigate this potential transient is impacted by the initiator. One entire train of safety equipment (ECCS pumps, Auxiliary Feedwater and support systems including the field flash for the Train 'A' EDG) would be disabled. In the case of Channel 'A' DC power loss, two of the three Auxiliary Feedwater pumps are impacted. Auxiliary Feedwater is required to remove decay heat. A random failure in the remaining train of Auxiliary Feedwater would lead to complete loss of a safety function. Operator action, both inside and outside the Control Room, is required to mitigate postulated consequences.

Plant Change Requests (PCRs) have been initiated to address both the reduction in the transient effects of these initiators and the plant's ability to mitigate them.

Interim compensatory measures are being taken before permanent plant changes are implemented. These measures include staging temporary ventilating equipment to be used in the event of loss of ventilation to the DC equipment rooms; operator training to sensitize the operators to the importance and complexity of addressing these events; and changes to the emergency operating procedures, including the Function Recovery Procedure, to ensure local, manual action can occur early enough to avoid postulated core uncover. This included a new instruction for local manual operation of the steam-driven Auxiliary Feedwater pump without DC control power.



As stated in GL 88-20, licensees are expected to move expeditiously to correct any identified vulnerabilities that warrant correction. The scenarios identified by the PRA team were determined by APS to be significant and immediate actions are being taken to ensure reliable and safe operation of the Palo Verde Units.

With the compensatory measures in place and an aggressive plant change implementation schedule, APS is confident that plant risk has been reduced. These findings further demonstrate that the IPE process is an effective tool in identifying dependent failures and subtle event scenarios that may contribute significantly to calculated core damage risk.

APS has discussed the measures being taken with NRC. This Operating Experience (OE) report alerts all other licensees to similar event scenarios at their plants and the need to take expeditious measures to reduce calculated core damage risk if any significant scenario is identified through the IPE process.

If you would like more detailed information on this issue, please contact the individual listed below.

INFORMATION CONTACT: Chuck Stevens, (602) 340-4081

