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MARTIN,J.B. Region 5 (Post 820201)

SUBJECT: Responds to NRC concerns raised during 910614 exit meeting following completion of 2-wk initial license exam process conducted at facilities between 910603-14.

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EXECUTIVE VICE PRESIDENT
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September 18, 1991

Docket Nos. STN 50-528/529/530

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

Reference: Letter from U. S. Nuclear Regulatory Commission, Region V, R. P. Zimmerman to W. F. Conway, APS, dated July 25, 1991; "Examination Report"

Dear Mr. Martin:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Licensed Operator Examination Report Response
File: 91-005.419.06; 91-056-026

This letter is in response to NRC concerns expressed to Arizona Public Service Company (APS) management at an exit meeting on June 14, 1991, following completion of the two week initial license examination process conducted at PVNGS between June 3 and 14, 1991. These concerns were subsequently enumerated in the referenced letter. During this examination period, 18 Reactor Operator candidates were examined by the NRC examination team. Of these, 16 candidates passed the examination and have been subsequently licensed.

Concerns identified to APS included several matters requiring resolution by PVNGS Management. The concerns include:

(1) The examiners identified that the training materials, particularly the system descriptions, were in some instances inaccurate or misleading, in representing operating procedures and systems interfaces. Also, the simulator materials sent to support the examination development required considerable revision to be acceptable for use in the examination. In particular, the certified simulator malfunctions initially supplied for scenarios development were limited in scope, and did not reflect the actual simulator capabilities.

(2) The examiners observed during the simulator examinations that some of the applicants were not familiar with mitigation of an uncontrolled reactor plant cooldown event, initiated by malfunctions in the secondary plant.

IE-1

3) The examiners observed that the verification of vital electrical power availability during an emergency event, appeared to be of lower priority at PVNGS than that suggested by the Combustion Engineering Owners Group (CEOG) generic guidance. We [The NRC] understand that you [APS] are currently changing PVNGS emergency operating procedures (EOPs) to remove this deviation.

The following discussion provides information, developed after review of these concerns, that is intended to improve both the training provided to initial license candidates (and that provided in the requalification program), and the examination process at PVNGS.

The first concern regards reference materials sent to the NRC for initial license examination preparation. The NRC indicated that System Description Manuals, provided to the NRC as part of the reference material, do not currently reflect the latest procedure and plant modification changes or appropriate systems interfaces to the described plant systems. This condition is acknowledged by APS. Both initial license training plant specific lesson plans and system descriptions are considered necessary for meeting the reference material requirements enumerated by the NRC. Initial Reactor Operator (RO)/Senior Reactor Operator (SRO) plant specific lesson plans continue to be upgraded, as plant changes are made, by way of a formalized Training Change System and a Content Change Log process.

An upgrade project that will review, revise (as necessary), and verify the PVNGS System Description Manuals is scheduled to begin October 1, 1991. Selected training, operations, and engineering personnel will function as a team to facilitate the improvements to the manuals which are used in instruction and examination of initial license candidates. Enclosure 1 provides the scope and schedule of the System Description Manual upgrade project. As the system descriptions are revised and updated, changes will be reviewed for potential impact on the system lesson plans and other training materials. Changes to the system descriptions, that affect the lesson plans, will be identified on Lesson Plan Content Change Logs and implemented into the lesson plans prior to the next instructional use.

APS has sent all requested Licensed Operator Requalification Lesson Plans, Examination Bank questions, Job Performance Measures (JPMs), and Simulator Scenarios to the NRC Lead Examiner for the 1991 NRC requalification examinations. This material will enable the NRC/Utility Examination Team to compile a comprehensive, challenging exam for the 30 designated Operators/Senior Operators. The current condition of the PVNGS system descriptions is not expected to reflect negatively on the upcoming requalification examination. A great deal of coordination has taken place between the Region V Examiners and the PVNGS Examination Team to assure an effective examination. APS anticipates that a continuation of this close coordination will provide a successful requalification examination.

The first concern also regards the simulator material that was sent to the NRC by APS to support the examination development. The NRC determined that this simulator material required considerable revision to be acceptable for use in the examination. The scenarios submitted to the NRC in early April 1991 for use in developing the examination were based upon existing software prepared to support certification of the simulator. Upgrades to the simulator were made in the ensuing six to eight week time period before the June 1991 initial examination validation process. These upgrades caused the enhanced simulator software data base (which had been subsequently upgraded by resolving discrepancy reports, adding modifications, and other activities that were beyond the specific simulator certification requirements) to differ from the submitted scenarios. APS had planned to update the simulator scenarios prior to the NRC Examination Team validation week. Efforts were made by the instructor development group to upgrade these scenarios as the Initial License Training Program was brought to a close, but not all upgrades were finalized until the validation week in late May 1991.

As a part of the reference material to support examination development, APS sent to the NRC a copy of the recently completed 1991 Certification Submittal. This Certification Submittal contains information supporting certification of the PVNGS Unit 1 Simulator in pursuant to 10 CFR 55.45, but only documents a fraction of the full capability of the simulator. To provide a compilation of all simulator capabilities, both certified and uncertified, APS has prepared a "Simulator Capabilities Manual" that specifies all capabilities of the present, certified PVNGS Unit 1 Simulator. This manual annotates all simulator malfunctions and overrides available, not just those that were included in the certification documentation. This includes some 362 malfunctions with their attendant cause and effects documentation. A list of remote functions has been included as well as a description of each. Panel overrides, such that the instructor/examiner can manipulate any switch, meter, lamp, or potentiometer on the panels, have been listed in the most user-friendly manner possible.

There are, however, certain known exclusions to the override concept. The PVNGS Unit 1 Simulator is unable to override keypads (quality safety parameter display system, plant computer, radiation monitoring system, etc.); unable to override digital readouts (boronometer, rod displays, core protection calculator, etc.); and unable to override the synchroscopes due to those devices not being processed through the computer input/output system. This Simulator Capabilities Manual also includes a section addressing the annunciator Crywolf features. A description of the Crywolf function has been included. This function allows Crywolf at the input to the annunciator system and makes thousands of points available in the Crywolf processor. The best source of information for Crywolf is the series of Annunciator Response Procedures numbered 41AL-1RK1A through 41AL-1RK7C. The Simulator is able to Crywolf at any of the points listed in the above set of procedures. Additionally, this manual includes a description of the capability and a listing of the breaker override functions on the simulator. A select set of breakers can be manipulated or failed through this capability, and most major pumps and components are included in this list.

Although not fully functional on the simulator at this time, the Simulator Capabilities Manual included a section addressing transmitter overrides. This section includes a discussion of the capabilities of specific transmitters, and a schedule for implementation. A subset of the transmitter overrides section will be the radiation monitoring system (RMS) overrides. Although RMS transmitters are conceptually the same as other transmitters, the functionability of the radiation detectors is significantly different, warranting a separate processor for this purpose. The nature of the RMS override is the same as the transmitter override and hence, the same information has been supplied.

This manual has been previously transmitted to the Region V Chief Examiner for the 1991 requalification examination and to the NRC contractor, EG&G, for the upcoming initial license reexamination. Enclosure 2 provides the table of contents for this Simulator Capabilities Manual.

The second concern regards a scenario on Excessive Reactor Cooldown which involved failure of 4 of 18 RO candidates to recognize the need to isolate the main steam path to the turbine following a reactor trip and a main steam isolation signal (MSIS) failure. Following discussions with the operator candidates and the stand-in SRO Control Room Supervisors (CRSs) involved, APS has determined that the RO candidates demonstrated less than desired reaction time to isolate a path of excessive cooldown. APS has also determined that the existing Emergency Operating Procedures (EOPs) are adequate to mitigate the excessive cooldown events if the candidates had acted in a more timely manner. The present RO Initial Training Program does include training on the concept of excessive cooldown, including practice with different types of excessive cooldown scenarios in the simulator. However, the Initial Training Program could have more fully emphasized the circumstances surrounding this scenario, including ensuring that MSIS trip setpoints are regularly checked to ensure knowledge of the relationship between reactor trip and MSIS actuation. This scenario will be added to the training program for all future RO license candidates to allow all future candidates to have full benefit of this instruction. The fully qualified SROs, serving in the role of CRSs for the RO candidates, performed satisfactorily during this scenario. The PVNGS Licensed Operator Requalification Program will include several excessive steam demand scenarios in the next six months using the present and future EOPs. APS, therefore, believes that no adjustment to the present Licensed Operator Requalification program is required.

The third concern regards the prioritization of the vital auxiliaries safety function in the setup and implementation of PVNGS EOPs. Enclosure 3 provides a justification for acceptability of maintenance of vital auxiliaries in the current (and future) EOPs. The APS position is that the current EOPs correctly implement the hierarchy of safety functions required by CEN-152. The future EOPs will also address the safety functions in the required order.

With these changes and upgrades, as detailed in the discussion of each concern, APS is confident that the PVNGS Operator Training Programs will improve in order to better meet expectations in the instruction and examination of Licensed Operators. APS has a strong commitment to resolving these concerns as quickly and prudently as possible, and I am available to discuss our response at your convenience.

Sincerely,

James M. Levine for WFC

WFC/GEC/gec

Enclosures

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ENCLOSURE 1

REFERENCE MATERIAL UPGRADE SCHEDULE

The System Description Manual upgrade project will consist of three specific phases. The following is a brief description of each phase and the associated completion dates:

Phase 1: Those system descriptions required, at a minimum, in order for the NRC and APS to provide an accurate and comprehensive initial license examination will be reviewed, revised (as necessary), and verified by April 1, 1992. This date will support submittal of revised system descriptions for the next initial license examination scheduled for June 1992. The following is a listing of System Description Manual sections (individual system descriptions, with system designation) that will be completed in Phase 1:

SG	Main Steam
MT	Main Turbine System
CD	Condensate System
FW	Feedwater System
ED	Feedwater Heater Extraction Steam, Drains, and Vent System
AF	Auxiliary Feedwater System
DW	Demineralized Water Makeup System
CT	Condensate Transfer and Storage
RC	Reactor Coolant System
SI	Safety Injection System
CH	Chemical and Volume Control System
SC	Secondary Chemical Control System
SS	Nuclear Sampling System
GS	Turbine Steam Seal and Drain System
LO	Lube Oil System
GH	Generator Hydrogen and CO_2 System
SO	Generator Seal Oil System
CE	Stator Cooling System
AR	Condenser Air Removal System
CO	Main Turbine Control Oil System
CW	Circulating Water System
TB	Cooling Tower Makeup and Blowdown System
PW	Plant Cooling Water System
TC	Turbine Cooling Water System
NC	Nuclear Cooling Water System
SP	Essential Spray Pond System
EW	Essential Cooling Water System
AS	Auxiliary Steam System
FT	Steam Generator Feedwater Pump Turbine System
WC	Normal Chilled Water System
HF	HVAC - Fuel Building

ENCLOSURE 1 (Continued)

REFERENCE MATERIAL UPGRADE SCHEDULE

EC	Essential Chilled Water System
HJ	HVAC - Control Building
HA	HVAC - Auxiliary Building
HD	HVAC - Diesel Generator Building
HC	HVAC - Containment Building
HP	Containment Hydrogen Control System
CP	Containment Purge System
GR	Gaseous Radwaste System
DF	Diesel Fuel Oil and Transfer System
IA	Instrument and Service Air System
FP	Fire Protection System
DS	Domestic Water System
GA	Service Gases
DG	Diesel Generator System
MA	Main Generation
MB	Excitation and Voltage Regulation
PB	Class IE 4.16-kV Power System
PE	Class IE Standby Generation System
PG	Class IE 480V Power Switchgear System
PH	Class IE 480V Power MCC System
PK	Class IE 125 V-dc Power System
PN	Class IE Instrument AC Power System
NA	Non-Class IE 13.8-kV Power System
NB	Non-Class IE 4.16-kV Power System
NG	Non-Class IE 480V Power Switchgear System
NH	Non-Class IE 480V Power MCC System
NK	Non-Class IE 125 and 48 V-dc Power System
NN	Non-Class IE Instrument AC Power System
NQ	Non-Class IE Uninterruptable AC Power System
QA	Normal Lighting and 208/120V Power System
QB	Essential Lighting System
QD	Emergency Lighting System
QF	In-Plant Communications
ES	Safety Equipment Status System
RJ	Plant Computer System
RK	Plant Annunciator System
SA	Engineered Safety Features Actuation
SB	Reactor Protection System
RI	In-Core Reactor Instrumentation
SE	Ex-Core Neutron Monitoring System
SF	Reactor Control System
SH	Qualified Safety Parameter Display System
SQ	Radiation Monitoring System

ENCLOSURE 1 (Continued)

REFERENCE MATERIAL UPGRADE SCHEDULE

Phase 2: An additional number of system descriptions will be reviewed, revised (as necessary), and verified by June 1, 1993 to complete updating of those system descriptions of which operators are expected to be cognizant. The following is a listing of System Description Manual sections (individual system descriptions, with system designation) that will be completed in Phase 2:

OS	Lube Oil Storage, Transfer and Purification System
CI	Chlorine Injection
PC	Fuel Pool Cooling and Cleanup System
HN	HVAC - Ancillary Buildings
HT	HVAC - Turbine Building
HS	HVAC - Miscellaneous Site Structures
HR	HVAC - Radwaste Building
CL	Containment Leak Test System
LR	Liquid Radwaste System
SR	Solid Radwaste System
RL	Radioactive Laundry and Decontamination Facility
RD	Radioactive Waste Drain Facility
RE	Radiation Exposure and Maintenance System
RF	Radioactive Filter Handling System
RS	Interim On-Site Low-Level Radioactive Waste Storage Facility
FH	Fuel Handling and Storage System
QG	Grounding System (Electrical Portion)
QH	Cathodic Protection System
QJ	Freeze Protection System
QK	Fire Detection and Alarm System
SM	Seismic Instrumentation
SV	Loose Parts and Vibration Monitoring System

Phase 3: Beginning early in Phase 1 will be a process of determining the root cause or causes, that has or have contributed to APS not properly maintaining the system descriptions in a current condition. Following the determination of the root cause or causes, APS will undertake corrective action (continuing through Phase 2) to ensure that all system descriptions that have been revised as part of the Phase 1 or Phase 2 activities are fully up to date at the end of the project. At the end of Phase 2, a process will be in place to ensure continued updating of the System Description Manuals. Completion of this Phase 3 is scheduled for June 1, 1993, coincident with the completion of Phase 2.

ENCLOSURE 2

SIMULATOR CAPABILITIES MANUAL
TABLE OF CONTENTS

I INTRODUCTION

II INITIAL CONDITIONS

III MALFUNCTIONS

III-A-1 CERTIFIED - LIST
III-A-2 CAUSE AND EFFECT

III-B-1 TESTED - LIST
III-B-2 CAUSE AND EFFECT

III-C-1 UNTESTED - LIST
III-C-2 CAUSE AND EFFECT

IV REMOTE FUNCTIONS

V PANEL OVERRIDES

V-A LAMPS
V-B METERS
V-C POTENTIOMETERS
V-D SWITCHES

VI CRYWOLF

VII BREAKER OVERRIDES

VIII TRANSMITTER OVERRIDES

IX RMS OVERRIDES

ENCLOSURE 3

Justification for Acceptability of Maintenance of Vital Auxiliaries in the Current EOPs

The Concern:

CEN-152, Revision 2, considers Maintenance of Vital Auxiliaries (MVAs) immediately after Reactivity Control requirements have been addressed. The flowcharts used by the Primary Operator (PO) and Secondary Operator (SO) do not follow this hierarchy in an obvious manner. The SO verifies that required Emergency Safety Feature (ESF) actuations have occurred before checking that the turbine and generator are tripped; whereas, the PO does not address vital auxiliaries until the Safety Equipment Status System (SEAS) check at the bottom of the PO flowchart. The PVNGS Emergency Procedure Technical Guidelines (EPTGs) do not document deviations to CEN-152 in this area.

Information:

1. A particular hierarchy is required only for the safety functions. CEN-152 does not require that the substeps within a safety function be performed in the order presented in CEN-152.

2. Maintenance of vital auxiliaries in CEN-152 refers to AC and DC power availability. Of the four substeps to verify this safety function, three refer to AC power. Plant specific methods in substep 3.d would logically include the maintenance of 125 V-DC and 120 V-AC instrument power, because none of the first three steps refer to DC power. Refer to the following that is excerpted from page 4 of 11 of Revision 2 of CEN-152, "Standard Post Trip Actions":

Maintenance of Vital Auxiliaries
(AC & DC Power)

Instructions	Contingency Actions
3. Verify plant electrical power requirements are satisfied by the following:	3. If electrical power requirements are not satisfied, Then do the following as necessary:
a. Main turbine tripped	a. Trip the turbine
and	
b. Generator output breaker open	b. Open the generator output breaker
and	
c. [Station loads transferred offsite]	c. Ensure the diesel(s) are started
and	
d. [Plant specific methods, insert here].	d. [Plant specific methods, insert here].

ENCLOSURE 3 (Continued)

Justification for Acceptability of Maintenance of Vital Auxiliaries in the Current EOPs

3. Step 3.3 for Appendix B in the EPTG states that checking the plant within ESF setpoint "ensures proper system response of vital auxiliaries." This step satisfies Instruction and Contingency 3.d of CEN-152 -- plant specific methods for monitoring of vital auxiliaries. Refer to the following that is excerpted from page 48 of 317 of Revision 0 of PVNGS procedure 40AC-9OP10, "Emergency Procedure Technical Guidelines":

APPENDIX B

PROCEDURE: EP

STEP: 3.3

OBJECTIVE: The objective of this step is to ensure ESF actuation signals exist as appropriate for plant conditions. Contingencies to manually initiate required functions, and to inform the CRS of ESF status will be provided.

BASIS: This step ensures proper operation of all Engineered Safety Features by comparing plant parameters to ESF setpoints. This ensures proper system response of vital auxiliaries and system components to maintain Safety Functions.

SOURCE DOCUMENT: ESF Setpoints per Technical Specification Table 3.3-4 CEN-152, Rev. 02, Section 2.0, Plant Specific Support for Vital Auxiliaries, Instruction 3d, 6a, 7c, 8a, 9a, 9b; Contingency 3d, 7c, 8a, 8c, 9b.

DEVIATION: None

SYSTEM KNOWLEDGE	SPECIAL CONSIDERATIONS
The operator should know:	
How to determine if an ESF setpoint is exceeded;	Manual initiation of an ESF system may require coordination with the Primary Operator.
How to determine an ESFAS actuation;	
How to manually initiate an ESF System.	

ENCLOSURE 3 (Continued)

Justification for Acceptability of Maintenance of Vital Auxiliaries in the Current EOPs

4. Verification that the plant is within ESF setpoints verifies that the DC busses (and the AC instrument busses powered from them) meet the minimum requirements by their ability to actuate required ESFAS signals. If this does not occur, the contingency is for the operator to manually actuate the function.

5. Step 3.c of CEN-152 is to check that station loads are transferred to offsite, and the contingency is to ensure that the diesel generators are started. This step is satisfied by the SEAS check at the bottom of the PO's flowchart. Therefore, the check of the MVA safety function is started by the SO, and finished in Step 3.c after the main generator is off-line and after allowing time for any Emergency Diesel and Load Sequencer operations to occur.

Conclusions:

The hierarchy of CEN-152 is complied with in the current EOP. Ensuring that the plant is within ESF setpoints is a check of vital auxiliaries. CEN-152 Step 3.d is performed before 3.a, 3.b, and 3.c; therefore, the SO and PO each do part of the check, but the hierarchy of safety functions is maintained within the allowance of CEN-152.

Changes in Upgraded EOPs:

The additional information provided below briefly explains how the currently ongoing upgrade of PVNGS EOPs will address this concern. Note that the current method of ensuring vital auxiliaries are maintained is in accordance with CEN-152. The operator's actions will ensure that the plant is properly responding to any challenges to critical safety functions.

Maintenance of Vital Auxiliaries in the Upgraded EOPs

The upgraded PVNGS EOPs will take a slightly different approach to Maintenance of Vital Auxiliaries. The applicable section of CEN-152, Revision 3, is very similar to Revision 2; however, the PVNGS-specific method of implementing this guidance will be modified.

1. The secondary operator will ensure that the main turbine and generator are tripped immediately after verifying that reactivity control has been satisfied. The primary operator will immediately ensure that at least one vital 4.16-kV bus has been energized.

2. This strategy will deviate from CEN-152 in that only one train of vital AC power is required and the DC busses are not checked directly. This deviation is justified in that only one bus of vital power is required to support safety functions, and that 120 V-AC and

ENCLOSURE 3 (Continued)

Justification for Acceptability of Maintenance of Vital Auxiliaries in the Current EOPs

DC are included in the 4.16-kV check (i.e., if the 4.16-kV bus is energized, then DC and 120 V-AC power is available). This deviation has been reviewed and accepted by Combustion Engineering.

3. The CRS will independently check the operators by verifying that the requirements for Maintenance of Vital Auxiliaries are satisfied on the Safety Function Flowchart (this is performed immediately following a reactor trip). The CRS will confirm that at least one 4.16-kV bus is energized, at least one train of Class DC is energized, and at least one train of Class Instrument AC is energized. These checks will not be recognized as part of the operator's Standard Post-trip Actions (flowcharts), but do complement the primary and secondary operator's actions to satisfy the Maintenance of Vital Auxiliaries safety function.

4. The strategy in the upgraded EOPs will be an improvement over that contained in the current EOPs for the Maintenance of Vital Auxiliaries. The method to be employed in the upgraded EOPs will be simpler, have unambiguous acceptance criteria, and have specific contingency actions. The current method does follow CEN-152 to ensure that the plant is responding properly to maintain critical safety functions; however, the new method is considered to be an improvement.