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KNIGHTON, G. W. PWR Project Directorate 7

SUBJECT: Requests schedular exemption from GDC-17, allowing low power licensing, initial operation in Modes 5 & 6 w/one diesel inoperable during repair & completion of appropriate diesel & associated sys testing. Related info encl.

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NOTES: Standardized plant. M. Davis, NRR: 1Cy. 05000530

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February 3, 1987
ANPP-39925-JGH/JRP/98.05

Director of Nuclear Reactor Regulation
Attention: Mr. George W. Knighton, Project Director
PWR Project Directorate #7
Division of Pressurized Water Reactor Licensing - B
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 50-530
Request for Schedular Exemption from General Design Criterion 17 (GDC-17)
File: 87-D-056-026

Dear Mr. Knighton:

Pursuant to 10CFR Part 50.12(a), Arizona Nuclear Power Project herewith requests a schedular exemption, during initial plant modes 5 and 6, from 10CFR Part 50, Appendix A, General Design Criterion 17-Electric Power Systems (GDC-17), GDC-17 requires in part that "an onsite electric power system shall be provided to permit functioning of structures, systems and components important to safety". As discussed in FSAR Section 8.3 the design of each PVNGS Unit incorporates two diesel generators (A and B) as part of the onsite Class 1E ac electrical system's standby power sources. The two Unit 3 diesels were expected to have been operational at the time of Unit 3 licensing, however, on December 23, 1986 the Train B diesel in Unit 3 failed during preoperational testing and sustained damage. This schedular exemption for Unit 3 is to allow low power licensing, initial operation in modes 5 and 6 with one diesel inoperable while undergoing repair, and completion of appropriate diesel and associated system retesting. This exemption will not present an undue risk to the public health and safety, and is consistent with the common defense and security in accordance with 10 CFR 50.12(a)(1). This request meets the special circumstances requirement of 10 CFR 50.12(a)(2) in that the exemption request would provide only temporary relief from GDC-17 and that the licensee has made good faith efforts to comply with the regulation. The following information is provided to support proceeding with Unit 3 licensing in March 1987 and plant operation in initial modes 5 and 6 while the "B" diesel is being repaired and retested.

1. There is no undue risk to the public health and safety and it is consistent with the common defense and security per 10 CFR 50.12(a)(1).

   Our present schedule calls for the issuance of a low power operating license for Unit 3 on or about March 1, 1987. The repairs on the Train B diesel generator are anticipated to be completed about May 2, 1987. The retesting program, Attachment 1, is anticipated to be complete by mid May 1987. In any event mode 4 entry will not be made until the diesel generator repair and retesting is accomplished.

B001
1/1

We have reviewed the impact of operating PVNGS Unit 3 in modes 5 (cold shutdown) and 6 (refueling) with only one of two redundant emergency diesel systems available and have concluded that the present safety analysis would not be exceeded. This conclusion is based on review of the current PVNGS FSAR, Chapters 6 and 15. The safety analysis events which assume use of emergency diesel power are those events which assume a loss of offsite power. These events are provided as Attachment 2. A review of the limiting loss of offsite power events has determined that each of these events are initiated from operational modes other than 5 and 6. The nuclear safety of Unit 3 in modes 5 and 6 is bounded by the existing safety analysis. By definition, the core is at its safest condition in these two operational modes. The nuclear safety of Unit 3 is enhanced by the fact that Unit 3 fuel has yet to be irradiated, therefore, there is no decay heat. During the time when one train of the PVNGS Unit 3 facility lacks an operable diesel (Train A being operable, Train B inoperable) for onsite source of emergency AC power, the activities to be performed at fuel loading require no emergency AC power to perform any of the safety functions specified by GDC-17. With no fission products in the core and no decay heat, core cooling is not required and fission product releases are not possible. Because core cooling is not required, no AC power is needed "to permit functioning of structures, systems and components important to safety" (GDC-17). Current PVNGS Units 1 and 2 technical specification 3.8.1.2 recognizes that in Modes 5 and 6 even when a fission product inventory has been developed and decay heat is available that having only one operable diesel generator and offsite power circuit is acceptable. This technical specification's bases (3/4.8) states "The Operability of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that (1) the facility can be maintained in the shutdown or refueling condition for extended time periods..." In summary, it would not be possible to have an accident or event of worse consequences or probability than those events that have been previously evaluated in the FSAR.

Attachment 2 lists the relative importance of diesel generator redundancy in the early stages of plant operation and Attachment 3 describes the normal offsite and onsite power system and its reliability.

Based on these facts and those presented in the attachments to this letter, granting of a Schedular Exemption from GDC-17 for initial mode 5 and 6 of Unit 3 will not present an undue risk to the public health and safety.

2. The licensee has made good faith efforts to support proceeding with Unit 3 licensing through initial modes 5 and 6, while the "B" diesel is being repaired.

At the time of the Unit 3 "B" diesel failure the PVNGS preoperational testing was proceeding in a controlled and orderly manner. Previous preoperational testing of similar diesels for Units 1 and 2 and subsequent surveillance tests were successfully completed with no similar indications to enable an earlier recognition of the Unit 3 problem by the utility. Adequate controls were taken by the utility to assure proper plant testing was accomplished prior to proceeding to the next step. Proceeding with licensing and operation of Unit 3 without the "B" diesel during initial plant operating modes 5 and 6 meets the intent of GDC-17 in that the diesels will be available prior to entering mode 4 and above where the diesels may be required to perform a safety function per the safety analysis. The root cause determination has been made so that proper repairs can be made. In addition, failure to grant the schedular exemption request will result in a loss of power generation capability since Unit 3 would enter commercial operation at a much later time than expected.

For these reasons, we believe we have made a good faith effort to comply with the regulation.

Please contact me if you have any questions.

Very truly yours,

JG Haynes

J. G. Haynes
Vice President
Nuclear Production

JGH/JRP/dlm
Attachment

cc: O. M. DeMichele (all w/a)
E. E. Van Brunt, Jr.
Director Region V, USNRC
NRC Project Manager-E. A. Licitra
NRC Resident Inspector-R. P. Zimmerman
A. C. Gehr

ATTACHMENT 1

RETESTING PROGRAM

PHASE I – Component Level Testing and Inspections

- °73 Instrumentation and Controls Test
- °9 Mechanical Test
- °Class C Cleanliness Inspections

PHASE II – Supplier Recommendations for Operational Test and Site Testing to Meet Reg. Guide 1.9.C.5.

- °35 Consecutive Starts with Load to 50% Power
- °Other Load Tests to Verify Generator Performance

PHASE III – Integrated Safeguards Testing

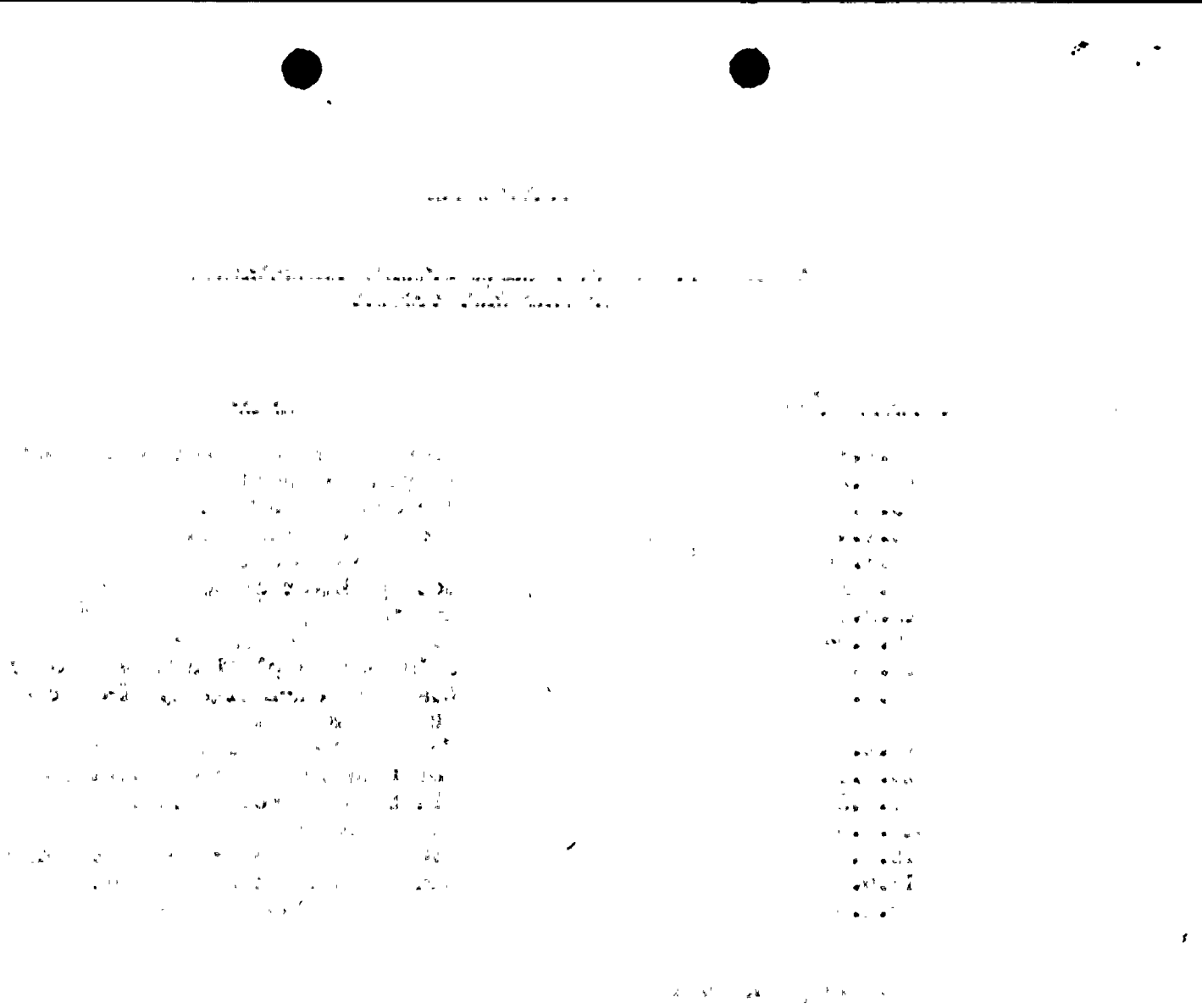
FSAR/RG REQUIREMENT	TEST CONTENT
FSAR 8.3.1.1.4.1 (b) FSAR 6.3.1.3.A (4) FSAR 7.3.1.1.10.7 TABLE 7.3-6	SIAS/CIAS
FSAR 8.3.1.1.4.6.A	LOP
R.G. 1.9.C.4 R.G. 1.108.C.2.A (1) & (2)	SINGLE LARGEST LOAD REJECTION
R.G. 1.108.C.2.A (3)	2 HR RUN - 110% LOAD 22 HR RUN - 110% LOAD
R.G. 1.108.C.2.A (4)	FULL LOAD REJECTION
R.G. 1.108.C.2.A (5)	SHUTDOWN/HOT START (WITHIN 5 MINUTES) SIAS/CIAS/LOP
FSAR 5.1.5.G.6 FSAR 5.1.5.G.7 FSAR 7.3.1.1.10.7 TABLE 7.3-7 FSAR 8.3.1.1.4.1 (c) FSAR 8.3.1.1.4.6. (b)	AFAS-1/LOP

ATTACHMENT 2

CHAPTER 15 SAFETY ANALYSIS EVENTS THAT ASSUME A LOSS OF OFFSITE POWER

FSAR SECTION	EVENT
15.1.1	Decrease in Feedwater Temperature
15.1.2	Increase in Feedwater Flow
15.1.3	Increased Main Steam Flow
15.1.4	Excess Load Transient
15.1.5*	Steam Line Breaks
15.2.1	Loss of External Load
15.2.2	Turbine Trip
15.2.3*	Loss of Condenser Vacuum
12.2.4	Main Steam Isolation Valve Closure
15.2.6	Loss of Non-Emergency A-C Power to Station Auxiliaries
15.2.8	Feedwater Line Break
15.3.1	Total Loss of Reactor Coolant Flow
15.3.3*	Single RCP Rotor Seizure
15.3.4	RCP Shaft Break
15.5.2	CVCS Malfunction - PLCS Malfunction
15.6.3*	Steam Generator Tube Rupture
15.6.5	Loss of Coolant Accident

*Limiting LOP Event



ATTACHMENT 3

RELATIVE IMPORTANCE OF DIESEL GENERATOR REDUNDANCY IN THE EARLY STAGES OF PLANT OPERATION

The diesel generators are relied on for the safe shutdown of the plant and for accident mitigation. The importance of diesel generator redundancy in the early stages of plant operation is minimal for the following reasons:

- Prior to an accumulation of a significant fission product inventory, radiological hazards do not exist.
- Consequences of a hot and pressurized primary or secondary failure without decay heat and fission product inventory are self limiting pressure temperature excursions that do not have long term effects onsite or offsite.
- Prior to an accumulation of a significant fission product inventory, there is no source of decay heat, so the safety systems provided to dissipate heat will not be required.
- The probability of a loss of offsite power concurrent with both the failure of Train A diesel generator and an accident is extremely low.

ATTACHMENT 4

UTILITY GRID DESCRIPTION

The Palo Verde Nuclear Generating Station, Units 1, 2 and 3 is connected by its associated transmission system to the Arizona-New Mexico-California-Southern Nevada extra high voltage (EHV) grid which is interconnected to other EHV systems within the Western System Coordinating Council. The PVNGS transmission system consists of five 525kV transmission lines in three corridors from PVNGS.

In addition to the PVNGS nominal net generating capacity of 3810 MWe, the EHV grid contains coal-fired plants totaling over 12,000 MWe of generation, 5700 MWe of nuclear generation, 13,500 MWe of both conventional and pumped storage hydro-generation, approximately 24,000 MWe of gas/oil-fire generation. The Palo Verde EHV transmission system and the EHV grid to which it is connected has interconnections with neighboring systems. These interconnections provide for interchanges of power and the improvement of system reliability.

Offsite Power System

The offsite power system extends from the utility power grid down to the 4.16kV class 1E buses. The following principal design bases are applied to the offiste power system.

- Electric power from the power grid to the site is supplied by five physically independent offsite sources designed and located to minimize the likelihood of simultaneous failure.

- Three physically independent startup transformers are provided to supply the onsite electric distribution system. The class 1E equipiment is supplied from the startup transformers.

- The outage of a single startup transformer does not jeopardize continued plant operation, i.e., at least one offsite source to plant auxiliaries and ESF buses is available with a single startup transformer outage.

- The switchyard is designed with duplicate and redundant systems; i.e., two trip coils per breaker, two protective relay schemes, and two ac supplies from the 13.8kV intermediate buses.

- The loss of a nuclear unit or the most critical unit on the grid does not result in loss of offsite power to the safety-related buses.

Onsite Power System

Five offsite sources of power provide preferred power to the three units through secondary windings of three startup transformers. The onsite power system of each unit is divided into two separate systems--the non-class 1E power system and the class 1E power system which is divided into two separate load groups. Power is supplied to the auxiliaries at 13.8kV, 4.16kV, and 480V levels. The onsite power system includes the class 1E power system which provides auxiliary ac and dc power for equipment used to shut down the reactor safely following a design basis event. The class 1E buses of each unit must be energized in order to provide preferred or standby power to the safety-related loads of each unit. The class 1E power systems are designed in accordance with IEEE 380-1974. A class 1E dc system provides four channels of 125V dc control power for class 1E switchgear, essential ac power inverters, and other engineered safety feature equipment.

The following principal design bases are applied to the onsite power system:

- The onsite power system for each unit is split into two independent load groups, each with its own offsite and onsite power supplies, buses, transformers, loads, and associated 125V dc control power. Either load group is independently capable of safely shutting down the unit.

- The onsite power system includes two redundant class 1E electric systems for each unit. The class 1E systems supply power at 4.16kV ac, 480V ac, and 125V dc, as required, to plant safety-related systems.

- One independent diesel generator is provided for each class 1E ac load group.

- No automatic transfers are provided between redundant load groups.

- There is complete independence of onsite electric systems between units.

- The class 1E electric systems are designed to satisfy the single failure criterion.

- For each protection and control channel, one independent 125V dc power source and one 120V vital ac power source are provided. Batteries are sized for a minimum of 2 hours of operation without support of a battery charger.

- A separate non-safety related dc system is provided for non-safety related controls and pump motors.

- Raceways are not shared by safety and non-safety cables. However, the non-safety cables that are supplied from or derived from class 1E sources are treated as safety related cables up to and including the isolation devices with regard to redundant system separation and identification criteria.

- Special identification criteria apply for class 1E equipment cabling and raceways.
- Separation criteria, which establish requirements for preserving the independence of redundant class 1E electric systems, comply with Regulatory Guide 1.75.
- Safety-related equipment is designed with the capacity to be tested periodically.