ENCLOSURE 1

BROWNS FERRY NUCLEAR PLANT

REVISED TECHNICAL SPECIFICATION PAGES

TECHNICAL SPECIFICATION NO. 264

UNIT 2

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENTS
3.1.B. (Cont'd)	4.1.B. (Cont'd)
2. With both RPS electric power monitoring channels for an inservice RPS MG set or alternate power supply inoperable, restore at least one to OPERABLE status within 30 minutes or remove the associated RPS MG set or alternate power supply from service.	2. At least once per 18 months by demonstrating the OPERABILITY of overvoltage, undervoltage and underfrequency protective instrumentation by simulated automatic logic actuation and verification of the circuit protector trip level setting as follows.

(a) overvoltage	(all device)	$\leq$ 126.5 VAC
(b) undervoltage	(MG Set)	$\geq$ 113.4 VAC
(c) undervoltage	(alt. supply)	$\geq$ 111.8 VAC
(d) underfrequency	(all devices)	$\geq$ 57.0 Hz

ENCLOSURE 2

DESCRIPTION AND JUSTIFICATION
BROWNS FERRY NUCLEAR PLANT (BFN)

REASON FOR CHANGE

In June 1978, during a review of the Hatch Unit 2 operating license, NRC questioned the adequacy of the Reactor Protective System (RPS) class 1E components against possible overvoltage or undervoltage conditions from the non-class 1E RPS power supplies. In applying single failure criteria, it was postulated that during a seismic event a non-class 1E Motor Generator (MG) voltage regulator could fail in a manner that would allow the MG output voltage to remain outside the voltage rating of the class 1E RPS components. Such an abnormal voltage could go undetected and if persisting for a sufficient time, could result in damage to RPS components with the potential loss of capability to scram the plant. Subsequently, NRC informed each utility with similar MG power supplies (Browns Ferry Plant was one of these) to implement interim surveillance procedures on the RPS, to log RPS voltage each shift, and to conduct additional RPS functional tests every six months, after detection of RPS bus voltage outside its designed range or after an operating basis earthquake. NRC further required these utilities to install class 1E circuit protectors on the RPS power supplies to isolate the RPS bus upon detection of adverse RPS voltage. NRC also required that Limiting Conditions For Operation (LCOs), surveillance requirements and setpoints be developed for these circuit protectors and that they be included in the technical specifications.

In response to the above NRC directive, BFN implemented the interim RPS surveillance requirements. In March 1981, BFN implemented a design change which would install RPS power monitoring system circuit protectors. In TVA letter dated August 9, 1984, TVA committed to amend the technical specifications to reflect surveillance requirements for the RPS power monitoring system.

DESCRIPTION AND JUSTIFICATION FOR THE CHANGE

The new calibration surveillance requirements specified below provide additional assurance that the RPS components are being operated within their design voltage and frequency limits.

4.1.B.2 ADD THE FOLLOWING SURVEILLANCE:

"At least once per 18 months by demonstrating the OPERABILITY of overvoltage, undervoltage, and underfrequency protective instrumentation by simulated automatic logic actuation and verification of the circuit protector trip level setting as follows:

(a) overvoltage	(all device)	$\leq$ 126.5 Vac
(b) undervoltage	(MG Set)	$\geq$ 113.4 Vac
(c) undervoltage	(alt. supply)	$\geq$ 111.8 Vac
(d) underfrequency	(all devices)	$\geq$ 57.0 Hz"

JUSTIFICATION

The main function of the RPS is to automatically initiate a reactor scram in a timely manner in order to 1) preserve the integrity of the fuel cladding, 2) preserve the integrity of the nuclear system process barrier, and 3) limit the uncontrolled release of radioactive material following an accident. In order to assure that the appropriate class 1E RPS equipment is adequately protected from an overvoltage, undervoltage, or underfrequency condition resulting from a non-class 1E system powered from the same MG set, BFN implemented a modification. This modification provides two redundant, class 1E, seismic category 1 power monitoring systems on the output of each RPS MG set and the alternate power supply transformer. Each device, upon detection of one of the above mentioned conditions trips to open power contactors which isolate the class 1E RPS bus from the non-class 1E RPS power supply.

The RPS components are rated at 115 ± 10% Vac and 60 +0%, -5% Hz. The upper voltage limit of 126.5 Vac is taken from the RPS components rating of 115 Vac +10% and is established as the upper voltage technical specification trip level setting limit for both the MG sets and the alternate supply. A calculation was performed in order to obtain their minimum voltages. These values are 113.4 Vac for the MG sets and 111.8 Vac for the alternate supply. These values are based on worst case line voltage drops for the current plant configuration and include a 10% load growth margin. The underfrequency lower component rating is taken as the technical specification trip level setting.

As described above, the installation of the RPS power supply monitoring circuit protector devices protects class 1E equipment. In accordance with 10CFR50.36, BFN technical specifications for unit 2 needs to be amended to reflect the design of the plant. The added surveillance assures that the installed protective device is performing as designed therefore, assuring that the class 1E RPS components will be protected from the above mentioned non-class 1E conditions and perform their intended safety function.

ENCLOSURE 3

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION
BROWNS FERRY NUCLEAR PLANT (BFN)
UNIT 2

DESCRIPTION OF PROPOSED TECHNICAL SPECIFICATION

The proposed amendment would change the BFN Technical Specifications (TS) for Unit 2 to add surveillance requirement 4.1.B.2. The addition of this surveillance would demonstrate the operability of the Reactor Protection System (RPS) overvoltage, undervoltage, and underfrequency protection instrumentation which has recently been installed.

BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION

NRC has provided standards for determining whether a significant hazards consideration exists as stated in 10CFR50.92(c). A proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not 1) involve a significant increase in the probability of consequences of an accident previously evaluated, or 2) create the possibility of a new or different kind of accident from an accident previously evaluated, or 3) involve a significant reduction in a margin of safety.

1. The proposed change does not involve a significant increase in the probability or consequence of any accident previously evaluated.

   A modification was made to install redundant class 1E circuit protection devices between the non-class 1E RPS power supplies and the class 1E RPS power supplies. These circuit protective devices consist of a contactor which will open by 1) an overvoltage relay with a trip level setting of $\leq$ 126.5 Vac, 2) an undervoltage relay with a trip level setting of $\geq$ 113.4 Vac for the MG sets, 3) an undervoltage relay with a trip level setting of $\geq$ 111.8 Vac for alternate supply, and 4) an underfrequency relay trip level setting of $\geq$ 57 Hz on all devices.

   The cabinets and conduits for each RPS power monitoring system are located in the control building, which is a seismic category 1 structure.

   This structure will provide protection from effects of tornadoes, tornado missiles, and external floods. The components of each monitoring system are also seismically qualified for class 1E application as required by GDC 2.

In order to comply with GDC 21, there are two physically independent and fully redundant circuit interrupters provided for each RPS bus, including alternate supply. This redundancy provides single failure protection in case one circuit does not function properly. This also provides sufficient reliability to ensure the RPS performs its intended safety function.

The BFN Final Safety Analysis (FSAR) section 7.2.3.2 states that the power to each of the two reactor protection trip systems is supplied, via a separate bus, by its own high-inertia, a-c motor generator set. The high inertia is provided by a flywheel. The inertia is sufficient to maintain voltage and frequency within ±5% of rated values for at least 1.0 second following total loss of power to the MG set. In applying this to section 14.5.4.4.b of the FSAR accident analysis, loss of auxiliary power assumes the RPS MG set coastdown time until loss of MG generator output voltage to be 5.0 seconds. Thus the upper and lower bounds for voltage output and time delay are identified as significant performance parameters expected from the MG set design. The RPS power monitoring system installed is designed for the MG sets to provide no time delay. Consequently, the trip level settings for the RPS power monitor must be outside the expected operating range of the MG set. For a nominal 120 Vac MG output voltage, the 5% regulation band (114 to 126 volts) is within the technical specification trip level setting of 113.4 to 126.5 Vac. This will allow the MG set to function within its intended and designed time and voltage range before the RPS power monitoring system trips. These settings support the design and function of the high-inertia MG sets, and therefore, support the assumptions made in the BFN FSAR.

Therefore, the design, trip level settings, and intended function of the RPS power monitoring system are both bounded and support the current BFN FSAR accident analysis.

2. The proposed amendment will not create the possibility of a new or different kind of accident.

The proposed change does not affect the operation or intended function of any currently installed safety related equipment. If all the protective circuits in one MG set fail to open, the redundant train of RPS systems is still available to mitigate any design basis accident. The RPS power monitoring system does not perform any specific safety function therefore, failure would, at worst case, be bounded by the current BFN Final Safety Analysis.

3. The proposed amendment will not involve a significant reduction in a margin of safety.

   The additional surveillance requirements resulting from the subject modification, enhance to overall dependability of the RPS system. By specifying overvoltage, undervoltage, and underfrequency values ensures that the RPS power monitoring system will protect the RPS components so they can perform their intended function.

   This system provides no direct safety function. It provides isolation between the non-class 1E RPS power supplies and the class 1E power distribution buses. It functions to isolate the RPS power distribution buses upon detection of overvoltage, undervoltage, and underfrequency on the RPS power supplies thereby preventing possible adverse operation of the class 1E RPS components outside their designed voltage and current ranges.

DETERMINATION OF BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS

Since the application for amendment involves a proposed changed that is encompassed by the criteria for which no significant hazards consideration exists, TVA has made a proposed determination that the application involves no significant hazards consideration.