Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

OCT 3 0 2000

WBN-TS-00-014

10 CFR 50.4
10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555

Gentlemen:

In the Matter of)
Tennessee Valley Authority)

Docket No.50-390

WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - TECHNICAL SPECIFICATION (TS) CHANGE WBN-TS-00-014 - DIESEL GENERATOR ACTION COMPLETION TIME EXTENSION

In accordance with the provisions of 10 CFR 50.4 and 50.90, TVA is submitting a request for an amendment to WBN's license NPF-90 to change the TSs for Unit 1. The proposed change requests a one time approval to extend the Action Completion Time for diesel generator 1B-B from 72 hours to 10 days in order to replace the diesel's electric generator. Although the 1B-B diesel generator is fully operable, TVA has determined based on a review of oil and vibration trend indications that it may be prudent to replace the electrical generator portion of the diesel, in order to maintain the high reliability of the component.

The next Train B work period begins on November 13, 2000. Preventative maintenance tests and inspections on the diesel generator at that time will add an additional data point to confirm whether the diesel generator is still trending negatively. Preparations are now being made to replace the generator should trending information warrant. Therefore, TVA requests prompt review and approval for the proposed one time TS before December 11, 2000, (the following available work week) in order to perform the work in the two week Train B work period which begins at that time.

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Should the Staff need additional time to complete its review of this one time required change, TVA can adjust its work schedule. WBN Licensing will communicate with the NRR Project Manager so appropriate work scheduling activities can be performed.

Enclosure 1 to this letter provides the description and evaluation of the proposed change and basis for the prompt review request. This includes TVA's determination that the proposed change does not involve a significant hazards consideration, and is exempt from environmental review. Enclosure 2 contains copies of the appropriate TS pages from Unit 1 marked-up to show the proposed change. Enclosure 3 forwards the revised TS pages for Unit 1 which incorporate the proposed change.

TVA has determined that there are no significant hazards considerations associated with the proposed change and that the change is exempt from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9). The WBN Plant Operations Review Committee and the Nuclear Safety Review Board have reviewed this proposed change and determined that operation of WBN Unit 1 in accordance with the proposed change will not endanger the health and safety of the public. Additionally, in accordance with 10 CFR 50.91(b)(1), TVA is sending a copy of this letter and enclosures to the Tennessee State Department of Public Health.

If necessary, TVA will be glad to meet with the Staff to discuss this issue at the NRC's convenience in order to expedite the approval of this proposed TS amendment. There are no regulatory commitments in this submittal. If you have any questions about this change, please contact me at (423) 365-1824.

Sincerely,

P. L. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures
cc: See page 3

OCT 3 0 2000

Subscribed and sworn to before me
on this 30th day of October 2000.

E. Jeannette Long
Notary Public

My Commission Expires June 27, 2001

cc (Enclosures):

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1
DOCKET NO. 50-390

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE WBN-TS-00-014
DESCRIPTION AND EVALUATION OF THE PROPOSED CHANGE

I. DESCRIPTION OF THE PROPOSED CHANGE

TVA proposes a one time modification to the Limiting Condition for Operation (LCO) 3.8.1 Condition B, Required Action B.4 to allow for a one time increase in the diesel generator Action Completion Time from 72 hours to 10 days for the 1B-B emergency diesel generator.

The WBN TS LCO 3.8.1.B.4 currently states: "Restore Required DG(s) to OPERABLE Status" with a Completion Time of 72 hours AND Six Days from discovery of failure to meet LCO. TVA's proposed change provides a footnote that reads, *"10 days is allowed for the 1B-B diesel generator to replace the electrical generator. This allowance is only applicable until the beginning of the Cycle 4 Refueling Outage."*

II. REASON FOR THE PROPOSED CHANGE

Following the recent refueling outage, a corrective action document, was written to denote a potential adverse trend regarding the diesel generator 1B-B bearing sump oil and shaft vibration analysis by the WBN predictive maintenance group. The oil analysis, using direct reading Ferrography and Silicon content, has indicated an increase in both of these elements. Silicon is measured to assess the status of insulation between the rotating shaft and bearing. The purpose of the insulation is to prevent circulating currents through the generator shaft. Oil analysis Silicon levels in the north side generator bearing are trending as follows:

- 6/30/00 - 2 ppm
- 8/23/00 - 3 ppm
- 10/17/00 - 7 ppm (after refueling outage)

Vibration analysis is also showing an increasing trend although the overall vibration levels still remain below the alert limit value of 0.325 in/sec and well below the fault limit value of 0.700 in/sec.

The following readings were taken from the South Horizontal direction in the 1B-B diesel generator.

- 7/25/00 - .085 in/sec
- 8/22/00 - .184 in/sec
- 10/17/00 - .227 in/sec

An evaluation of the third harmonic (or three times component running speed, which is an indicator of misalignment or bearing slippage) indicates an increasing trend. This value also remains below the alert level at this time.

Currently, the 1B-B diesel generator remains operable, however, the above data shows a negative trend. During the week of November 13, 2000, the 1B-B diesel generator is scheduled to be taken out of service for preventative maintenance and other work. During that component outage, shaft lift measurements and further oil analysis trending are scheduled to be performed.

Similar problems have occurred with the WBN generators in the past. On June 2, 1994, the 1B-B diesel generator bearing failed. Oil analysis of Silicon samples prior to that failure were:

- 3/19/91 - 5 ppm
- 6/26/91 - 12 ppm
- 6/02/94 - failure

Oil samples were not routinely taken between June 26, 1991, and failure on June 2, 1994, which was prior to receiving an operating license for WBN Unit 1. During this three year period, the diesel generator was either in layup or undergoing component or preoperational testing. Therefore, there is no known correlation between the three year time period and the time to failure.

In order to maintain the availability and reliability of diesel generator 1B-B, TVA has developed a plan to replace the electric generator in the 1B-B diesel should the data continue the negative trend. Depending on the November testing results, this replacement could be scheduled as early as December 11, 2000, or could occur at any time during the current operating cycle.

Maintenance and testing of the same train are performed in the same work period to provide defense in depth. This reduces the risk to the plant for removing equipment from service. As for the 1B-B diesel, this work period is scheduled every fourth week. Should the Staff need additional time to review and approve this request beyond

the December 11, 2000, adjustments can be made in the site work schedule to accommodate the Staff's review.

TVA is unable to implement this plan within the current 72 hour LCO Completion Time. TVA's current estimate is that the work could be completed in 10 days with reasonable contigencies as follows:

1.	Disassemble and remove existing 1B-B electrical generator	77 hours
2.	Install generator	16 hours
3.	Perform general alignment	24 hours
4.	Reassemble support equipment	62 hours
5.	Perform Operability Testing and remove hold order	30 hours
6.	Contingency	31 hours
	Total	240 hours

III. SAFETY ANALYSIS

Offsite Transmission Network

WBN is connected to a strong offsite transmission network which is described in Section 8.0, "Electrical Power," of the WBN Final Safety Analysis report (FSAR). The primary elements of the system include two 161 kV transmission lines from the Watts Bar Hydro Plant 161 kV switchyard. The transmission lines and the WBN 6.9 kV common station service transformers (CSSTs) are located entirely on TVA property, supported on separate towers and routed to minimize the likelihood of their simultaneous failure. The failure of any tower in one line will not endanger the other line under operating, postulated accident and environmental conditions.

TVA's Transmission Power Systems organization performs comprehensive transmission system studies for all TVA nuclear plants. Results of steady-state and transient stability studies show that the offsite power sources remain intact and are reliable sources to supply the onsite electric power system for (1) a safety injection (SI) in a WBN nuclear unit with an electrical fault in the generator step-up transformer, or (2) an SI in a WBN nuclear unit and either the loss of a large generating unit, the loss of the largest load on the grid, or the loss of the most critical transmission line.

Each 161 kV circuit and the CSSTs have sufficient capacity and adequate voltage to supply the essential safety auxiliaries of a unit under a design basis event concurrent with a simultaneous worst-case single transmission system contingency. Physical separation of lines, primary and backup protection systems and a strong transmission grid

minimize the probability of simultaneous failures of offsite power sources. The 6.9 kV shutdown boards in each power train derive power from preferred power from a CSST or from their respective standby power source. During conditions where the preferred power source is not available, each 6.9 kV shutdown board is energized from a separate diesel generator.

Emergency Diesel Generator - General Description

The standby diesel generators serve as the plant emergency standby alternating current (ac) power source. The diesels are designed to operate in parallel with the normal power source for test and exercise purposes.

For WBN Unit 1, the diesels consist of four self-contained, water-cooled, automatic starting, diesel engine driven, stationary electric generators. Two diesel generators in the same train are required to mitigate a design basis event in one unit. Redundancy for single failure is provided by maintaining four diesels in ready condition for automatic start.

The WBN diesel generators were furnished by Engine Systems Inc. and consists of two 16-cylinder engines manufactured by General Motors-Electro-Motive Division (type 16-645-E4 or -E4B) directly connected to a common 6.9kV Electric Products (now known as NEI Peebles) generator with exciter. Each diesel generator is capable of starting and accelerating to rated speed within 10 seconds to provide power to the needed engineered safety features (ESF) and shutdown loads. The units have a "continuous" and "short time" rating at 4400kW-5500 kVA and 4840kW-6050 kVA respectively.

The diesel generators are designed to operate under each of the following onsite events or any simultaneous combination thereof:

1. Loss Of Offsite Power (LOOP).

2. Degraded voltage on the 6.9 kV shutdown boards

3. Safety Injection (SI) signal.

The diesel generators are also designed for a life of 40 years with normal maintenance. The diesel generator voltage and frequency limits and the starting and loading reliability factors meet Regulatory Guide 1.9, "*Selection, Design, Qualification, and Testing of Emergency Diesel Generator Units Used as Class 1E Onsite Electric Power Systems at Nuclear Power Plants,*" and IEEE Standard 387-1984, "*Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Stations.*"

Additional information regarding the design of the WBN electrical system is contained in Chapter 8, "*Electric Power,*" of the Updated Final Safety Analysis Report.

In the event of a loss of offsite power (LOOP) during power operation, the four 4400 kW tandem diesel generators ensure that sufficient power is available to the safety-related equipment, which is needed for the safe shutdown of the plant and for mitigation and control during accident conditions. During shutdown and refueling conditions, the diesel generators will ensure that the facility is able to maintain shutdown or refueling conditions for extended periods of time.

The standby power system is divided into two redundant load groups. Each load group is composed of two electrical power trains (Train 1A and 2A; Train 1B and 2B) and supplies power to plant safety-related equipment. Each of the four diesel generators are connected to their respective shutdown boards (e.g., diesel generators 1A-A to shutdown board 1A-A, etc.) The primary difference in loading is due to the Unit 1 diesel generators supplying loads for the required Unit 1 ECCS equipment and Unit 1 auxiliaries. The Unit 2 diesel generators are primarily loaded with Unit 2 auxiliaries required for Unit 1 operation (e.g., Essential Raw Cooling Water).

WBN diesel generators have high availability and reliability ratings. For implementation of 10 CFR 50.63, "*Loss of all alternating current power,*" and Regulatory Guide 1.155, "*Station Blackout,*" WBN established a diesel generator target reliability of 0.975. Since commercial operation in 1996, WBN has received only 2 valid failures to start on the four diesels in over 500 starts. This places the diesel generators well above the reliability goal of .975.

TVA's diesel generator replacement plan further provides for restrictions on other scheduled work for the remaining power sources. That plan includes a step to confirm prior to work beginning, that no maintenance or modifications are being performed that would impact the offsite power supply or the DC power supply in order to provide stability to the remaining electrical power sources. This step would ensure, prior to the 1B-B diesel being removed from service, that no emergent work on the electrical power sources had occurred since the schedule was developed.

Risk Considerations

The increase in risk for having the 1B-B diesel generator out of service seven additional days was determined in accordance with the guidelines established in Regulatory Guide 1.174, "*An Approach for Using Probabilistic Risk*

Assessment in Risk-Informed Decisions On Plant Specific Changes to the Licensing Basis" and Regulatory Guide 1.177, *"An Approach for Plant-Specific Risk informed Decision Making: Technical Specifications"*. The WBN baseline core damage frequency(CDF) with expected equipment unavailabilities is 4.43 E-5/reactor-year as stated in Revision 2 to the WBN Probabilistic Safety Assessment (PSA) model. The Risk Achievement Worth(RAW) for the 1B-B diesel generator is 1.26 or a conditional CDF of 5.58E-5.

The incremental conditional core damage probability (ICCDP) for the proposed increase to a 10-day is as follows:

LCO = (5.58E-5 - 4.43E-5)[(240-72)/8760] = 2.21E-7

This ICCDP is less than the 5.0 E-7 criteria listed in Regulatory Guide 1.177 and so may be considered small for a single TS Action Completion Time change.

The WBN baseline large early release frequency (LERF)with expected equipment unavailabilities is 1.35 E-6/reactor-year as stated in Revision 2 to the WBN Probabilistic Safety Assessment (PSA) model. The RAW with respect to LERF for the 1B-B diesel generator is 1.59 or a conditional LERF of 2.15E-6.

The incremental conditional large early release frequency (ICLERF) for the proposed increase to a 10-day is as follows:

LCO = (2.15E-6 - 1.35E-6)[(240-72)/8760] = 1.53E-8

This ICCDP is less than the 5.0 E-8 criteria listed in Regulatory Guide 1.177 and so may be considered small for a single TS Action Completion Time change.

The WBN PSA has not yet undergone a PEER review. The WBN Individual Plant Evaluation (IPE) was submitted on September 1, 1992. The IPE was also independently reviewed by Dr. Ian Wall. WBN submitted Revision 1 to the IPE on May 2, 1994 and a safety evaluation was received on October 5, 1994. Since that time the PSA has undergone one additional revision. Revision 2 to the WBN PSA is the basis for this submittal and it was prepared for TVA by ERIN Engineering Inc. The use of ERIN Engineering by TVA for Revision 2 also served as an independent check of the original model created by PLG, Inc. TVA has performed a self-assessment of the current model in preparation for a Westinghouse Owners Group (WOG) PEER review currently scheduled for next spring. Revisions to the PSA model are in progress as a result of this self assessment, however the results are not finalized.

For comparison, the change in mean core damage probability as discussed in the Electrical Power Research Institute (EPRI) Report EPRI TR-105396, "Probabilistic Safety Assessment (PSA) Applications Guide," was also determined. The change in mean core damage probability (ΔCDP) can be determined by multiplying the change in mean core damage frequency for the given condition by the length of time in the configuration. For the case considering one diesel generator out of service due to maintenance, the calculated mean core frequency is 5.58E-5 events per year. The change in ΔCDP for the seven additional days (ten days total, including the LCO Action Completion Time) of maintenance is calculated as follows:

$$\Delta CDP = [(5.58E-5) - (4.43E-5)] * (10/365) = 3.15E-7$$

Based on Figure 4.3 of the PSA Applications Guide (EPRI TR-105396), this change in mean core damage probability is well below the threshold for potentially risk significant changes (1.0E-5). In fact, the determined ΔCDP is at the lower range of non-risk significant category (1.0E-7).

Using RAW to compute a new CDF for the 1B-B diesel generator out of service also implies that the calculated CDF would include expected equipment unavailabilities. Since the submittal of the Individual Plant Evaluation, Revision 1, on May 2, 1994, WBN has worked to reduce risk due to equipment unavailability by performing maintenance and testing according to a 12-week rolling schedule defined by equipment trains. This schedule allows equipment to be removed from service concurrently with attendant equipment thereby reducing the number of times LCOs are entered. WBN procedure Technical Instruction (TI)-124, "Equipment to Plant Risk Matrix," provides guidance for reducing risk by controlling the equipment that can be removed from service concurrently with the 1B-B diesel generator.

The above analysis is conservative. For the purpose of this one time Action Completion Time extension, the analysis assumes an additional seven days of out of service time for the 1B-B diesel generator. The current technical specifications would allow the 1-A and 2-A diesel generators to be out of service for up to 72 hours followed consecutively by the 1-B and 2-B diesel generators being out of service for 72 hours (total of six days). The request in this submittal for 1B-B diesel generators would be qualitatively more conservative than the current technical specifications for the first 6 days in terms of risk to the plant. Further, the last 30 hours of the current repair schedule consists of operability testing. During approximately 24 hours of this period the diesel generator would be on line to the grid and available in the event of an actual plant event. Accordingly, it could be considered that of the ten day Action Completion Time, the

actual period of additional risk beyond the current technical specifications is about 72 hours and of that, 31 hours is planned for contingency.

IV. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

TVA proposes a one time modification to the WBN Unit 1 technical specification to revise the Limiting Condition for Operation (LCO) 3.8.1 Condition B, Required Action B.4 to allow for a one time increase in the diesel generator Action Completion Time from 72 hours to 10 days. This allowance would facilitate potential repairs to an emergency diesel generator to improve reliability.

TVA has concluded that operation of Watts Bar Nuclear Plant (WBN) Unit 1 in accordance with the proposed one time change to the technical specifications does not involve a significant hazards consideration. TVA's conclusion is based on its evaluation, in accordance with 10 CFR 50.91(a)(1), of the three standards set forth in 10 CFR 50.92(c).

A. The proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

The diesel generators are designed as backup AC power sources in the event of loss of offsite power. The probability of occurrence of an accident is not increased as the diesel generators perform a function of accident mitigation only and cannot cause an accident. Similarly, the diesel generator itself would be out of service and could not cause other equipment to malfunction.

The technical specifications currently would allow two emergency diesel generators of one train to be out of service for up to three days followed consecutively by two diesel generators of the opposite train to be out of service for three more days. Thus, the current specifications would allow two diesels to be unavailable for six days total. This proposed change would allow a single diesel generator to be out of service for ten days. This is not considered to be a significant departure from the current requirement. Further, the consequences of a postulated accident with one diesel generator unavailable is enveloped by the current allowance for both trained generators unavailable.

The cumulative consequences of an accident are not significantly increased as the increase in core damage frequency as a result of the additional Action Completion Time extension is non-risk significant.

Therefore, the proposed amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated.

B. **The proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.**

The possibility for a new or different kind of accident from any accident previously evaluated does not exist as a result of the increase in Action Completion Time for the diesel generator, as the diesel generator performs a function of accident mitigation only and cannot result in the malfunction of other equipment while undergoing repairs.

C. **The proposed amendment does not involve a significant reduction in a margin of safety.**

The calculated increase in the Action Completion Time for one diesel generator out of service shows a non-risk significant increase in the predicted core damage frequency (CDF). TVA concludes that the margin of safety has not been reduced.

V. ENVIRONMENTAL CONSIDERATIONS

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b) and TVA's environmental review process, an environmental assessment of the proposed change is not required.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE WBN-TS-00-014
MARKED PAGES

I. AFFECTED PAGE LIST

3.8-3

II. MARKED PAGES

See attached.

ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY
WATTS BAR NUCLEAR PLANT (WBN)
UNIT 1

PROPOSED TECHNICAL SPECIFICATION (TS) CHANGE TS WBN-TS-00-014
REVISED PAGES

I. AFFECTED PAGE LIST

3.8-3

II. REVISED PAGES

See attached.

ADD

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore required DG(s) to OPERABLE status.	72 hours* AND 6 days* from discovery of failure to meet LCO
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND	
	C.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

INSERT

* *10 days is allowed for the 1B-B diesel generator to replace the electrical generator. This allowance is only applicable until the beginning of the Cycle 4 Refueling Outage.*

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Restore required DG(s) to OPERABLE status.	72 hours* AND 6 days* from discovery of failure to meet LCO
C. Two offsite circuits inoperable.	C.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND	
	C.2 Restore one offsite circuit to OPERABLE status.	24 hours

(continued)

* 10 days is allowed for the 1B-B diesel generator to replace the electrical generator. This allowance is only applicable until the beginning of the Cycle 4 Refueling Outage.