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FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
AUTH.NAME AUTHOR AFFILIATION
PLUNKETT,T.F. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Application for amends to licenses DPR-31 & DPR-41,revising TS 3/4.7.1 & associated bases which address max allowed reactor thermal power operation w/inoperable main steam safety valves.

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FPL

JUL 19 1994

L-94-176
10 CFR §50.36
10 CFR §50.90

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

Gentlemen:

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
Proposed License Amendments
Operation at Reduced Power Levels with Inoperable MSSVs

In accordance with Title 10 Code of Federal Regulations §50.90 (10 CFR §50.90), Florida Power and Light Company (FPL) requests that Appendix A of Facility Operating Licenses DPR-31 and DPR-41 be amended to revise Turkey Point Units 3 and 4 Technical Specifications (TS) 3/4.7.1. and its associated BASES, which address maximum allowed reactor thermal power operation with inoperable main steam safety valves (MSSVs).

By letter dated January 20, 1994, Westinghouse issued Nuclear Safety Advisory Letter (NSAL) 94-001 which notified FPL of a deficiency in the basis of the Turkey Point Technical Specification 3/4.7.1, which allows the plant to operate at reduced power levels with a specified number of MSSVs inoperable. Westinghouse also provided a copy of this notification to the Nuclear Regulatory Commission (NRC) since this issue impacts information contained in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants." In response to Westinghouse's NSAL letter, the enclosed proposed license amendment is provided.

FPL has determined that the proposed license amendments do not involve a significant hazards consideration pursuant to 10 CFR §50.92. A description of the amendment request is provided in Attachment 1. The no significant hazards determination in support of the proposed Technical Specifications changes is provided in Attachment 2. Attachment 3 provides the proposed revised Technical Specifications changes.

In accordance with 10 CFR §50.91(b)(1), a copy of these proposed license amendments is being forwarded to the State Designee for the state of Florida.

The proposed amendments have been approved by the Turkey Point Plant Nuclear Safety Committee and the FPL Company Nuclear Review Board.

Should there be any questions on this request, please contact us.

Very truly yours,

T.F. Plunkett
Vice President
Turkey Point Plant

A001
1/1

TFP/RJT/rt

Attachments

cc: S. D. Ebneter, Regional Administrator, Region II, USNRC
T. P. Johnson, Senior Resident Inspector, USNRC, Turkey Point
W. A. Passetti, Florida Department of Health and Rehabilitative Services

STATE OF FLORIDA)
) ss.
COUNTY OF DADE)

T. F. Plunkett being first duly sworn, deposes and says:

That he is Vice President, Turkey Point Nuclear Plant, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.

T. F. Plunkett

Subscribed and sworn to before me this
18 day of July, 1994.

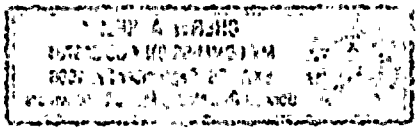
Cheryl A Kelly
Name of Notary Public (Type or Print)

NOTARY PUBLIC, in and for the County of Dade, State of Florida

My Commission expires
Commission No.

CHERYL A. KELLY
MY COMMISSION # CC 223781
EXPIRES: September 27, 1996
Bonded Thru Notary Public Underwriters

T. F. Plunkett is personally known to me.



ATTACHMENT 1

DESCRIPTION OF AMENDMENTS REQUEST

DESCRIPTION OF AMENDMENTS REQUEST

Introduction

By letter dated January 20, 1994, Westinghouse issued Nuclear Safety Advisory Letter (NSAL) 94-001 which notified FPL of a deficiency in the basis of the Turkey Point Technical Specification (TS) 3/4.7.1, which allows the plant to operate at reduced power levels with a specified number of main steam safety valves (MSSVs) inoperable. Turkey Point's Technical Specification 3/4.7.1 is not based on a detailed analysis, but rather on the assumption that the maximum power level at which the plant is allowed to operate is a linear function of the available MSSV relief capacity. The linear function is identified in the BASES section for Turkey Point Technical Specification 3/4.7.1 and is used to calculate the maximum allowable power range neutron flux high setpoint values shown in TS Table 3.7.1. Under certain conditions and with typical conservative safety analysis assumptions, a loss of load/turbine trip transient from reduced power conditions may result in overpressurization of the main steam system when operated in accordance with Turkey Point Technical Specification 3/4.7.1.1. Consequently, the linear function assumption is not valid for all postulated cases. Instead, Westinghouse has developed an algorithm to calculate the allowed reduced power conditions. Based on the evaluation presented in NSAL 94-001, FPL proposes to amend Turkey Point Units 3 and 4 Technical Specification 3/4.7.1. and its associated BASES, which address maximum allowed reactor thermal power operation with inoperable main steam safety valves (MSSVs).

Discussion

The Loss of Load/Turbine Trip (LOL/TT) event (Loss of External Electrical Load) is analyzed in Section 14.1.10 of the Turkey Point Updated Final Safety Analysis Report (UFSAR). This analysis shows that core protection margins (Departure from Nucleate Boiling Ratio) are maintained, the reactor coolant system (RCS) will not overpressurize, and the main steam system will not overpressurize. The analysis assumes an immediate loss of steam relieving capability through the turbine and coincident loss of all main feedwater. No credit is taken for the direct reactor trip on turbine trip, since this trip would not be actuated for a loss of steam load. Rather, the transient is terminated by a reactor trip on high pressurizer pressure, overtemperature ΔT, or low-low steam generator water level. Secondary side overpressure protection is provided by actuation of the main steam safety valves (MSSVs), which are designed to relieve at least full power nominal steam flow. The analysis verifies that the MSSV capacity is sufficient to prevent secondary side pressure from exceeding 110 percent of the design pressure.

The UFSAR only analyzes the LOL/TT transient from the full power initial condition, with cases examining the effects of assuming primary side pressure control and different reactivity feedback

conditions. With fully operational MSSVs, it has been demonstrated that overpressure protection is provided for all initial power levels. However, for Turkey Point 3 and 4, like most other Westinghouse plants, TS 3.7.1.1 allows operation with a reduced number of operable MSSVs at a reduced power level as determined by resetting the power range neutron flux high setpoint. This Technical Specification is not based on a detailed analysis, but rather on the assumption that the maximum allowable initial power level is a linear function of the available MSSV relief capacity. Recently, Westinghouse has determined that the linear assumption was not valid for all postulated cases (reference 1).

The problem, as described by Westinghouse, is if main feedwater is lost, a reactor trip is necessary to prevent secondary side overpressurization for all postulated core conditions. At high initial power levels a reactor trip is actuated early in the transient as a result of either high pressurizer pressure or overtemperature ΔT. For Turkey Point, the reactor trip occurs as a result of either the high pressurizer pressure setpoint or low-low steam generator water level setpoint being reached. The reactor trip terminates the transient and the MSSVs maintain steam pressure below 110% of the design value.

Westinghouse states in NSAL 94-001, that at lower initial power levels a reactor trip may not be actuated early in the transient. An overtemperature ΔT trip is not generated since the core thermal margins are increased at lower power levels. A high pressurizer pressure trip is not generated if the primary pressure control systems function normally. The reactor eventually trips on low steam generator water level, but this may not occur before steam pressure exceeds 110% of the design value if one or more MSSVs are inoperable in accordance with the Technical Specification.

Although from a licensing basis perspective, this condition may result in secondary side overpressurization in the event of a LOL/TT transient, Westinghouse has determined that this issue does not represent a substantial safety hazard. There are several mitigating factors which provide assurance that there is no loss of safety function to the extent that there is no major reduction in the degree of protection provided to the public health and safety. These include, but are not limited to, the following:

1. Adequate overpressure protection is provided at all power levels if all of the MSSVs are operable.

2. If a reactor trip does not occur but main feedwater flow is maintained, operation in accordance with TS Table 3.7-1 will not result in an overpressure condition.

3. In any LOL/TT transient, the atmospheric steam dump valves and/or condenser steam dump valves actuate to relieve energy from the steam generators prior to the opening of the MSSVs, and continue to relieve steam if the MSSVs do open. Since it is not a safety

grade function, steam dump is not assumed to operate in the safety analysis; however, in reality it is the first line of defense in protecting the secondary system against overpressurization. It is very improbable that all these components would be inoperable coincident with inoperable MSSVs.

4. Even near the beginning of core life with a positive or zero Moderator Temperature Coefficient (MTC), the primary coolant heatup resulting from the transient would tend to drive the MTC negative, which would reduce the core power and heat input to the coolant. This would result in a lower required MSSV capacity to prevent secondary overpressurization. The safety analysis does not credit the reduction of MTC during the transient.

Proposed Technical Specifications Changes

FPL proposes to change the following Technical Specifications in support of the proposed license amendments:

1. Technical Specification Table 3.7-1 (pg. 3/4 7-2): Revise the Maximum Allowable Power Range Neutron Flux High Setpoints, as per the revised algorithm methodology.

   Justification: As stated above, the UFSAR only analyzes the LOL/TT transient from the full power initial condition. Therefore, the setpoints listed in Table 3.7-1 of Technical Specifications 3/4.7.1 are not based on a detailed analysis, but rather on the assumption that the maximum power level at which the plant is allowed to operate is a linear function of available MSSV relief capacity. The linear function is identified in BASES Section 3/4.7.1.1. However, under certain conditions and with typical conservative safety analysis assumptions, a LOL/TT transient from reduced power conditions may result in overpressurization of the main steam system (>110 percent). At lower initial power levels, a reactor trip may not be actuated early in the transient. An overtemperature ΔT trip is also not generated since the core thermal margins are increased at lower power levels. If the primary pressure control system functions properly, a high pressurizer pressure trip is not generated. This results in a longer time during which primary heat is transferred to the secondary system. The reactor eventually trips on low-low steam generator water level, but the trip may not occur before steam pressure exceeds 110 percent of the design value, if one or more MSSVs are inoperable in accordance with TS 3/4.7.1. Consequently, the linear function assumption is not valid. Instead, Westinghouse recommends that the following algorithm should be used to calculate the setpoint values.

   TS Table 3.7-1 and the associated BASES will be revised such that the maximum power level allowed for operation with inoperable MSSVs is below the heat removing capability of the operable MSSVs. A conservative method to accomplish this is to set the

power range high neutron flux setpoint to this power level, thus ensuring that the actual power level cannot exceed this value. To calculate this setpoint, the governing equation is the relationship:

$$q = m \Delta h$$

where:

q = the heat input from the primary side,

m = the steam flow rate,

Δh = the heat of vaporization at the steam relief pressure assuming no subcooled feedwater.

The algorithm proposed by Westinghouse to use for defining the revised setpoint values is the following:

$$Hi\ \phi = (100/Q) \frac{(w_s\ h_{fg}\ N)}{K}$$

where:

$Hi\ \phi$ = Safety Analysis power range high neutron flux setpoint, percent

Q = Nominal Nuclear Steam Supply System (NSSS) power rating of the plant (including reactor coolant pump heat), MWt

K = Conversion factor; 947.82 (Btu/sec)/MWt

w_s = Minimum total steam flow rate capability of the operable MSSVs on any one steam generator at the highest MSSV opening pressure (including tolerance and accumulation) - (Lbm/sec). For example, if the maximum number of inoperable MSSVs on any one steam generator is one, then w_s should be a summation of the capacity of the operable MSSVs at the highest operating pressure, excluding the highest capacity MSSV. If the maximum number of inoperable MSSVs per steam generator is three, then w_s should be a summation of the capacity of the operable MSSV at the highest operable MSSV operating pressure, excluding the three highest capacity MSSVs.

h_{fg} = Heat of vaporization for steam at the highest MSSV opening pressure (including tolerance and accumulation) - (Btu/lbm)

N = Number of loops in plant

The values calculated from this algorithm must then be adjusted lower for use in TS 3.7.1.1 to account for instrument and channel uncertainties. The maximum plant operating power level would then be lower than the reactor protection system setpoint by an appropriate operating margin.

The Westinghouse methodology summarized above was utilized in calculating the maximum allowable power range neutron flux high setpoint with 1, 2, and 3 inoperable MSSVs on any operating steam generator. Table 1 (attached) compares the maximum allowable power range neutron flux high setpoint values versus number of inoperable MSSVs with the power range values calculated using the linear function and the algorithm method of analysis.

2. Technical Specification 3.7.1.1 (pg. 3/4 7-1): Add the following footnote to TS 3.7.1.1, APPLICABILITY statement **for Mode 3 operation only:**

* In Mode 3, when the Reactor Trip System breakers are in the closed position and the Control Rod Drive System is capable of rod withdrawal.

Justification: The current Technical Specifications specify in Mode 3, with three inoperable MSSVs (on any one steam generator), that the maximum allowable power range neutron flux high setpoint shall be reduced to 27% of Rated Thermal Power (RTP). However, in Mode 3 both the Intermediate Range Neutron Flux setpoint and the Power Range Neutron Flux Low setpoint will limit the unit to $\leq$ 25 % of RTP. In Mode 3 the only credible event which would place 3 MSSV's out of service is the scheduled testing of the MSSVs. These tests are generally performed prior to commencing or completing a refueling and/or extended outage or in accordance with the requirements of the Inservice Testing Program.

In the proposed Technical Specifications, the maximum allowable neutron flux high setpoint for three inoperable MSSVs (on any one steam generator) is reduced from 27% of RTP to 14% of RTP. However in Mode 3, during testing of the MSSVs, the plant typically tests the MSSVs with the reactor trip breakers open and the control rod drive system not capable of withdrawing control rods. In this configuration, the reactor is physically tripped and not capable of increasing reactor power. FPL proposes to delete the applicability requirement to TS 3.7.1.1, when Turkey Point is configured with the reactor trip breakers open and the control rod drive system not capable of withdrawing control rods.

In Mode 3 with three inoperable MSSVs, with the reactor trip breakers closed and the control rod drive system capable of rod withdrawal, the plant will continue to be limited by the requirements of TS 3.7.1.1. The justification for the proposed change is supported by the defined actions required in the event the Intermediate Range Neutron flux setpoint, Power Range Neutron Flux Low setpoint, or the setpoint for the inoperable MSSVs

(TS Table 3.7-1) is exceeded. Exceeding these setpoints will result in a reactor trip.

3. Technical Specification BASES 3/4.7.1.1 (pg. B 3/4 7-1): Revise the BASES to reflect the proposed change to the algorithm methodology used to calculate the reactor trip setpoint.

   Justification: The proposed change is made to ensure consistency with the proposed change from a linear function to the algorithm method of analysis.

Summary

The revised setpoints are intentionally conservative to bound the Loss of Load/Turbine Trip transient. This conservatism is evident in the fact that the setpoint is based on the maximum number of inoperable MSSVs per loop. For example, in accordance with the proposed Technical Specifications, Turkey Point would reduce the neutron flux setpoint to 56% if a unit has up to one inoperable MSSV on each loop. This means that the plant should use this setpoint whether there are one, two, or three inoperable MSSVs, as long as there is only one inoperable MSSV per loop.

Another conservatism in the algorithm (and the existing TS 3.7.1.1) is the term w_s, which is the minimum total steam flow rate capability of the operable MSSVs on any one steam generator. This value is conservative since it assumes that if one or more MSSVs are inoperable per loop, the inoperable MSSVs are the largest capacity MSSVs at the highest operable MSSV operating pressure, regardless of whether the largest capacity MSSVs or the smaller capacity MSSVs are inoperable. Thus the existing and the proposed Technical Specifications are conservative.

Reference

1. Letter, N. J. Liparulo (Westinghouse) to U.S. Nuclear Regulatory Commission, concerning "Westinghouse Nuclear Safety Advisory Letter (NSAL) 94-001, Operation at Reduced Power Levels with Inoperable MSSVs," dated 1/28/94.

TABLE 1

MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES DURING THREE LOOP OPERATION

MAXIMUM NUMBER OF INOPERABLE SAFETY VALVES ON ANY OPERATING STEAM GENERATORS	MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT (PERCENT OF RATED THERMAL POWER)	
	CURRENT TECH SPEC REQUIREMENT (Linear Function Basis)	PROPOSED TECH SPEC REQUIREMENT (Algorithm Basis)
1	82	56
2	54	35
3	27	14 *

Note:

* For the case of reduced power operation with three (3) inoperable MSSVs, the maximum allowable Power Range Neutron High setpoint (14%) is lower that the maximum allowable Power Range Neutron Flux Low trip setpoint. The Power Range Neutron Flux Low trip setpoint value is ≤ 25% RATED THERMAL POWER per Technical Specification Table 2.2-1. This Power Range Neuton Flux Low trip setpoint is normally blocked above P-10 (approximately 10% RATED THERMAL POWER) and is automatically reinstated below the P-10 setpoint.

ATTACHMENT 2

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Description of Proposed License Amendments

By letter dated January 20, 1994, Westinghouse issued Nuclear Safety Advisory Letter (NSAL) 94-001 which notified FPL of a deficiency in the basis of the Turkey Point Technical Specification 3/4.7.1 which allows the plant to operate at reduced power levels with a specified number of main steam safety valves (MSSVs) inoperable. Turkey Point's Technical Specification (TS) 3/4.7.1 is not based on a detailed analysis, but rather on the assumption that the maximum power level at which the plant is allowed to operate is a linear function of the available MSSV relief capacity. The linear function is identified in the BASES section for Turkey Point Technical Specification 3/4.7.1 and is used to calculate the maximum allowable power range neutron flux high setpoint values shown in TS Table 3.7.1 Under certain conditions and with typical conservative safety analysis assumptions, a loss of load/turbine trip transient from reduced power conditions may result in overpressurization of the main steam system when operated in accordance with Turkey Point Technical Specification 3/4.7.1.1. Consequently, the linear function assumption is not valid for all postulated cases. Instead, an algorithm should be used to calculate the allowed reduced power conditions. Based on the evaluation presented in NSAL 94-001, FPL proposes to amend Turkey Point Units 3 and 4 Technical Specification 3/4.7.1. and its associated BASES, which address maximum allowed reactor thermal power operation with inoperable main steam safety valves (MSSVs).

Introduction

The Nuclear Regulatory Commission has provided Standards for determining whether a significant hazards consideration exists (10 CFR §50.92 (c)). A proposed amendment to an operating license for a facility 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 or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed below for the proposed amendment.

Discussion

(1) Operation of the facility in accordance with the proposed amendments would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated. The new power range neutron flux high setpoint values will ensure that the secondary side steam pressure will remain below 110

percent of the design value following a Loss of Load/Turbine Trip event, when one or more main steam safety valves (MSSVs) are declared inoperable. The proposed change will not impact the classification of the Loss of Load/Turbine Trip event as a Condition II probability event (faults of moderate frequency) per ANSI - N18.2, 1973. Accordingly, since the new power range neutron flux setpoints will maintain the capability of the MSSVs to perform their pressure relief function associated with a Loss of Load/Turbine Trip event, there will be no effect on the probability or consequences of an accident previously evaluated.

In addition, the proposed change to the applicability statement of TS 3.7.1.1, will not effect the probability or consequences of an accident previously evaluated, since the proposed plant condition with the reactor trip breakers open and the rod control system not capable of withdrawing rods is an analyzed safe shutdown condition.

(2) Operation of the facility in accordance with the proposed amendments would not create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed changes do not involve any change to the configuration or method of operation of any plant equipment, and no new failure modes have been defined for any plant system or component. The new power range neutron flux high setpoints will maintain the capability of the MSSVs to perform their pressure relief function to ensure the secondary side steam design pressure is not exceeded following a Loss of Load/Turbine Trip event. Therefore, since the function of the MSSVs is unaffected by the proposed changes, the possibility of a new or different kind of accident from any accident previously evaluated is not created.

In addition, the proposed change to the applicability statement of TS 3.7.1.1, will not create the possibility of a new or different kind of accident from any accident previously evaluated, since the proposed plant condition with the reactor trip breakers open and the rod control system not capable of withdrawing rods is an analyzed safe shutdown condition.

(3) Operation of the facility in accordance with the proposed amendments would not involve a significant reduction in a margin of safety.

The proposed changes to the Technical Specifications does not involve a significant reduction in a margin of safety. The algorithm methodology used to calculate the new power range neutron flux high setpoints is conservative and bounding since it is based on a number of inoperable MSSVs per loop; i.e., if only one MSSV in one loop is out of service, the applicable power range setpoint would be the same as if one MSSV in each loop were

out of service. Another conservatism with the algorithm methodology is with the assumed minimum total steam flow rate capability of the operable MSSVs. The assumption is that if one or more MSSVs are inoperable per loop, the inoperable MSSVs are the largest capacity MSSVs, regardless of which capacity MSSVs are actually inoperable. Therefore, since the power range neutron flux setpoints calculated for the proposed changes using the algorithm methodology are more conservative and ensure the secondary side steam design pressure is not exceeded following a Loss of Load/Turbine Trip event, this proposed license amendment will not involve a significant reduction in a margin of safety.

In addition, the proposed change to the applicability statement of TS 3.7.1.1, does not involve a significant reduction in a margin of safety, since the proposed plant condition with the reactor trip breakers open and the rod control system not capable of withdrawing rods is an analyzed safe shutdown condition.

Summary

Based on the above discussion, FPL has determined that the proposed amendment request does not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety; and therefore the proposed changes do not involve a significant hazards consideration as defined in 10 CFR §50.92.