FPL

10 CFR 50.90
10 CFR 50.91
L-2006-146
June 21, 2006

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

Re: Turkey Point Units 3 and 4
Docket Nos. 50-250 and 50-251
License Amendment Request No. 186
Intake Cooling Water Pump Allowed Outage Time Change

Pursuant to 10 CFR 50.90, Florida Power and Light Company (FPL) requests approval of a change to Turkey Point Unit 3 Facility Operating License DPR-31 and Turkey Point Unit 4 Facility Operating License DPR-41. The change concerns the allowed outage time (AOT) for one inoperable intake cooling water (ICW) pump. The proposed amendment would revise Technical Specification (TS) 3.7.3, Action a, to revise the AOT from seven (7) days to fourteen (14) days. A description of the proposed change is included in Attachment 1 to this letter.

This license amendment application has been prepared in accordance with the guidance provided 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 Decisionmaking; Technical Specifications." The evaluation of the proposed TS change concludes that the requested AOT extension is acceptable and results in a minimal increase in risk.

The Turkey Point Plant Nuclear Safety Committee and the FPL Company Nuclear Review Board have reviewed and approved the proposed amendment.

FPL requests approval of the proposed amendment within twelve (12) months of the submission date with implementation complete within ninety (90) days of issuance of the license amendment.

The proposed change has been evaluated in accordance with 10CFR50.91(a)(1), using the criteria in 10CFR50.92(c). FPL has determined that the proposed change involves no significant hazards considerations.

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

A001

Please contact Mr. Walter Parker, Licensing Manager, at 305-246-6632, if there are any questions regarding this submission.

I declare under penalty of perjury that the foregoing is true and correct.

Very truly yours,

6/21/2006
Executed on

Terry O. Jones
Vice President
Turkey Point Nuclear Plant

Attachments:
1) Proposed License Amendment
2) Marked Up Technical Specification Page
3) Camera Ready Technical Specification Page

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Mr. W. A. Passetti, Florida Department of Health

ATTACHMENT 1

Turkey Point Units 3 and 4

Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

License Amendment Request No. 186

Intake Cooling Water Pump Allowed Outage Time Change

Description of Proposed Change, Technical Analysis, and No Significant Hazards Consideration

ATTACHMENT 1

CONTENTS

1.0 INTRODUCTION

In accordance with 10 CFR 50.90, "Application for amendment of license or construction permit," Florida Light and Power Company (FPL) is proposing that the Turkey Point Unit 3 and Unit 4 Facility Operating Licenses be amended to revise the Technical Specifications (TS) associated with the intake cooling water (ICW) system pumps. The proposed change to TS 3.7.3, Intake Cooling Water System, Action a would increase the TS allowed outage time (AOT) for one inoperable ICW pump from seven (7) days to fourteen (14) days.

2.0 DESCRIPTION OF PROPOSED CHANGE

FPL proposes to revise TS 3.7.3, "Intake Cooling Water System," Action a, to read as follows:

" With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable."

The proposed change will permit additional time for repair and post maintenance testing of one of the three ICW pumps should it become inoperable. The benefit of the extended AOT includes minimizing the potential safety consequences and operational risks associated with the transient of a plant shutdown due to an inoperable ICW pump that cannot be repaired within the current 7-day AOT.

3.0 BACKGROUND

Basis for Current Requirements

The ICW System provides cooling water to the safety related Component Cooling Water (CCW) Heat Exchangers and to the Turbine Plant Cooling Water (TPCW) Heat Exchangers, and supplies water to the Lube Water System. A separate ICW System is provided for each nuclear unit. The TPCW and Lube Water Systems are intended to serve non-safety related functions only. The ICW pumps are not credited for fire water sources. The normal fire water system utilizes the raw water tanks (which store fresh city water) as suction for the electric and backup diesel driven fire pumps. The screen wash pumps can provide a backup source of fire protection water from the intake canal.

The ICW System includes three ICW pumps, tie headers, two independent supply headers, piping, valves, basket strainers, and those components required to take ICW from the plant

cooling canals via the intake structure and supply the CCW, TPCW, and Lube Water Systems and return the ICW to the plant cooling canal system.

The ICW System safety function is to remove the heat load from the CCW System during accident conditions to support both reactor heat removal and containment heat removal requirements.

The ICW quality related functions are to remove the heat load from the CCW System to support spent fuel cooling requirements, remove the heat load from the CCW System to achieve and maintain safe (cold) shutdown during plant fires that require control room evacuation, with or without concurrent loss of offsite power, to remove the heat load from the CCW System to achieve and maintain safe (hot) standby during plant fires not requiring control room evacuation with or without concurrent loss of offsite power, and to remove the heat load from the CCW System during refueling operation (Mode 6) to support the core decay heat removal requirements.

The non-nuclear safety functions of the ICW System are to remove the turbine plant heat load from the TPCW System to support turbine plant operation during normal, shutdown and refueling operations, to supply water to the non-safety related Lube Water System to meet the lube water supply requirements of the pumps in the intake area, and to remove the CCW System heat loads during normal and shutdown conditions to support normal containment heat removal and reactor power operation, including radwaste system operation.

The ICW System design basis heat load is 120 million BTUs per hour during a LOCA. The ICW flow rate required to remove this heat load at an intake canal design temperature of 100°F and corresponding CCW heat exchanger design parameters is 16,000 gpm. This flow rate can be provided by one ICW pump.

The CCW heat load on the ICW system can vary significantly and is dependent on numerous factors including the postulated event and time frame of interest, the cooling system operating alignment and assumed single active failure, and the cooling system flows. Heat exchanger performance monitoring confirms the ability of the CCW and ICW systems to remove design basis heat loads based on the ultimate heat sink temperatures that are being experienced. This monitoring determines system operability and establishes when CCW heat exchangers must be cleaned to maintain design basis heat removal capability with a single ICW pump.

The ICW system is required to be capable of performing its safety functions assuming a single active failure. To accommodate single active failures, the ICW supply headers to the CCW heat exchangers are cross-connected in an "open-system" configuration during normal plant operation. This requirement is necessary because at least one pump, one header, and two CCW

heat exchangers are required for 100% post-accident heat removal capability. The ICW headers may be cross-connected via either, or both, of the cross-connects located between the pump discharge and the CCW heat exchangers.

The Emergency AC Power system provides power from independent, redundant, safety-related buses to the ICW System components.

The ICW to TPCW isolation valves are required to automatically isolate ICW flow to the TPCW system following an accident to ensure adequate ICW flow is diverted to the CCW system heat exchangers for post-accident heat removal in the event of a single failure that results in only one ICW pump being available. The ICW to TPCW isolation valves do not automatically isolate upon loss of offsite power (LOOP). Should a LOOP event occur which is accompanied by a coincident single active failure affecting the availability of one intake cooling water pump, a condition could exist where flow from one intake cooling water pump may not be sufficient to accommodate intake cooling water system flow requirements. To mitigate this potential condition, controls are provided locally and in the control room to initiate manual closure of the power operated valve (POV) and isolate the TPCW heat exchangers. In addition, these valves (one for each unit) are provided with the capability to remain open for a minimum of 2 hours following a loss of instrument air to avoid potential damage to turbine plant equipment.

If the single active failure is assumed to be a POV, two ICW pumps can be assumed to be operable. The two operable ICW pumps can provide sufficient flow to accommodate the flow diverted through the TPCW system. Flow calculations have been performed for this configuration and indicate that the flows through the CCW heat exchangers are within the limits required to remove accident heat loads.

The ICW system design basis is that one ICW pump will provide the cooling water required to two CCW heat exchangers for heat removal during a design basis accident, i.e., a loss-of-coolant accident. The analyses of record assume that the cooling water supplied by the ICW pumps to the inlet of the CCW heat exchangers does not exceed 100°F.

The A and B pumps are powered by 4160 volt buses which can be powered by each train's associated emergency diesel generator. The C pump is powered by a swing 4160 volt safety related bus which can be powered, through aligning the bus manually, by either the train A or train B emergency diesel generator associated with the same unit. This pump is interlocked, such that, it is started on a LOOP or safety injection signal, if the supply breaker for the A or B ICW pump (associated with the A or B 4160 volt bus to which it is aligned) is open and racked out. The ICW system provides sufficient redundancy so that at least one ICW pump will continue to operate to handle heat loads from design basis accidents following a postulated single active failure.

Based on the identified ICW system design basis and the electrical independence of the ICW pumps, there is no credible single active failure event that could reduce the number of available ICW pumps below the design basis minimum of one operating pump.

4.0 REGULATORY REQUIREMENTS AND GUIDANCE

10 CFR 50.36, "Technical specifications," provides the regulatory requirements for the content required in a licensee's TS. Criterion 3 of 10 CFR 50.36(c)(2)(ii) requires a limiting condition for operation to be established for a structure, system or component that is part of a primary success path and which functions or actuates to mitigate a design basis accident or transient: that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. The ICW pumps satisfy this criterion.

FPL has determined that the proposed change does not require any exemption or relief from regulatory requirements, other than the TSs, and does not affect conformance to any General Design Criteria differently than described in the Updated Final Safety Analysis Report (UFSAR).

5.0 TECHNICAL ANALYSIS

This license amendment request (LAR) proposes to extend the TS AOT for an inoperable ICW pump from 7 days to 14 days. This LAR includes an integrated review and assessment of plant operations, deterministic design basis factors, and an evaluation of overall plant risk using probabilistic risk assessment (PRA) techniques. Deterministically, the proposed change is supported by the defense-in-depth basis that is incorporated into the plant design as well as in the approach to maintenance and operation. With respect to plant risk, the proposed change is supported by a plant-specific risk analysis performed in accordance with NRC guidance for making risk-informed decisions and risk-informed changes to the plant TSs.

This section provides the technical analysis of this proposed change with regard to the principles that adequate defense-in-depth is maintained, that sufficient safety margins are maintained, and that the proposed increases in core damage frequency and risk are small and consistent with the guidance of Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Bases", dated November 2002 and RG 1.177, "An Approach for Plant- Specific, Risk-Informed Decisionmaking: Technical Specifications" dated August, 1998.

5.1 Current Licensing Basis for ICW Pump AOT

Under the current licensing basis, if one ICW pump is inoperable, action must be taken to restore the pump to operable status within 7 days. In this condition, the two remaining operable ICW pumps are adequate to provide cooling for both normal and accident plant needs. The 7 day AOT takes into account the capability of the remaining pumps and the low probability of an accident occurring during this period.

5.2 Proposed TS 3.7.3, Action a Change and Benefits

The proposed change will allow an AOT of 14 days for ICW pump maintenance and testing activities. This will allow an additional 7 days beyond the current TS AOT and avoid or minimize TS-required plant shutdown time due to ICW pump maintenance and testing.

The integrity of the reactor coolant system, fuel and other components of the primary system of a nuclear plant can be adversely affected by the number of thermal or power transients that they are subjected to during their lifetime. As each additional thermal transient can affect this integrity, it is prudent to avoid such transients provided the health and safety of the public is preserved. Additionally, the cycling of the unit through a thermal transient cycles the secondary plant systems, as well as increases challenges to the operators. Placing the unit in hot shutdown requires additional routine surveys and inspections within the reactor containment building that increase personnel exposure.

The duration required to perform planned and corrective ICW pump maintenance has challenged the site's ability to complete these activities within the current TS AOT. A longer AOT will likely eliminate the need for regulatory relief associated with ICW pump maintenance activities. On May 20, 2006, FPL requested an emergency license amendment to increase the AOT for maintenance on the 3B ICW pump. Subsequently, this amendment was withdrawn since maintenance activities were accelerated and able to be completed prior to the expiration of the 7-day AOT. This experience, however, indicates the potential to exceed the current AOT of 7 days for an ICW pump outage.

The extended TS AOT for an ICW pump improves the effectiveness of the allowed maintenance period. A significant portion of on-line maintenance activities is associated with preparation and return to service activities, such as, switching and tagging, fluid system drain down, fluid system fill and vent, and pump and motor testing. The duration of these activities is relatively constant. A longer AOT allows more maintenance to be accomplished during a given on-line maintenance period and would therefore improve maintenance efficiency. Thus, total ICW pump unavailability may be reduced with this proposed change.

This change may allow some maintenance activities to be performed on-line which would otherwise require performance during a refueling outage. On-line preventive maintenance and scheduled overhauls provide the flexibility to focus more quality resources on any required or elective ICW pump maintenance. For example, during refueling outages, resources are required to support many systems; during on-line maintenance, plant resources can be more focused on the ICW pump overhaul.

5.3 Deterministic Assessment of Proposed ICW Pump AOT Extension

The effect of this LAR would be to allow continued power operation of a Turkey Point unit up to an additional 7 days while ICW pump maintenance or testing is performed. There are three ICW pumps for each unit with two pumps in operation to support normal plant heat loads. Plant operation with one ICW pump inoperable does not challenge plant operations in a manner that could cause an accident.

The ICW pumps are provided and designed with adequate independency, redundancy, capacity, and testability to ensure communication with the ultimate heat sink required to avoid undue risk to the health and safety of the public. This cooling source provides this capacity assuming a failure of a single active component. One of the three ICW pumps together with two CCW heat exchangers can accomplish the heat removal safety function. Therefore, if one ICW pump is inoperable, then a single failure of one of the remaining two operable pumps can be accommodated in the event of an accident.

Since a single failure of one ICW pump can be accommodated whether or not the third pump is operable, extending the AOT for an out of service ICW pump has no impact on the system design basis. Safety analyses acceptance criteria as provided in the Turkey Point UFSAR are not impacted by this change. ICW pump flow credited in the accident analyses will remain the same.

To ensure that the single failure design criterion is met, Limiting Conditions for Operation (LCO) are specified in the plant TS requiring all redundant components of the ICW system to be operable. When the required redundancy is not maintained, action is required within a specified time period, referred to as the AOT, to initiate a plant shutdown and place the plant in a safe condition. The AOT provides a limited time to restore equipment to operable status and represents a balance between the risk associated with continued plant operation with less than the required system or component redundancy and the risk associated with initiating a plant transient while placing the unit in a safer condition. Thus, while the AOT provided in the plant TS Actions are designed to permit limited operation with temporary relaxation of the single failure criterion, the acceptability of the maximum length of the AOT interval relative to the potential occurrences of design basis events needs to be considered. Since extending the AOT for a single

inoperable ICW pump does not change the design basis for ICW flow, the risk impact of ICW pump unavailability during the extended AOT (days 8 through 14 of the proposed 14 day AOT) must be evaluated quantitatively using a probabilistic approach.

In the event that an ICW pump is inoperable in operating Modes 1, 2, 3, and 4, existing TS 3.7.3, Action a, requires both remaining ICW pumps to be operable with independent power supplies. This provides assurance that a loss of offsite power event will not result in a loss of safety function during the period when one of the ICW pumps is inoperable.

5.4 Probabilistic Risk Assessment (PRA)

Risk-informed support for the proposed ICW pump AOT extension is based on 1) a risk assessment performed to quantify the change in core damage frequency (CDF) and large early release frequency (LERF), and the Incremental Conditional Core Damage Probability (ICCDP) and Incremental Conditional Large Early Release Probability (ICLERP) associated with the increased AOT for the ICW pumps; 2) the Configuration Risk Management Program (CRMP) which controls performance of other scheduled tasks during ICW pump outages; and 3) consideration of specific compensatory measures to reduce risk. The risk impact of the proposed changes has been evaluated and found to be acceptable. The effect on risk of the proposed increase in the AOT for restoration of an inoperable ICW pump has been evaluated using NRC's three-tier approach provided in RG 1.177:

Tier 1 - PRA Capability and Insights;

Tier 2 - Avoidance of Risk-Significant Plant Configurations; and

Tier 3 - Risk-Informed Configuration Risk Management.

5.4.1 Tier 1: PRA Capability and Insights

Quality has been an important issue for the Turkey Point PSA dating back to the model developed in response to Generic Letter (GL) 88-20, Individual Plant Examination (IPE) for Severe Accident Vulnerabilities, and associated supplements. The original development work was classified and performed as Quality Related under the FPL 10 CFR 50, Appendix B quality assurance (QA) program. The revision and applications of the probabilistic safety assessment (PSA) models and associated databases continue to be handled as Quality Related.

Administrative controls include written procedures and independent review of all model changes, data updates, and risk assessments performed using PSA methods and models. Risk assessments are performed by a PSA engineer, independently reviewed by another PSA engineer, and approved by the Department Head or designee. The Reliability and Risk Assessment Group

(RRAG) is required to follow the FPL Nuclear Engineering Quality Instructions (QI) using written procedures derived from these QIs. Procedures, risk assessment documentation, and associated records are controlled and retained as QA records.

Since the IPE, the RRAG has maintained the PSA models consistent with the current plant configuration such that they are considered living models. The PSA models are updated for different reasons, including plant changes and modifications, procedure changes, accrual of new plant data, discovery of modeling errors, advances in PSA technology, and issuance of new industry PSA standards. The update process ensures that the applicable changes are implemented and documented in a timely manner so that risk analyses performed in support of plant operations reflect the current plant configuration, operating philosophy, and transient and component failure history. The PSA maintenance and update process is described in the RRAG Standard, "Probability Safety Assessment Update and Maintenance Procedure." This standard defines two types of periodic updates: 1) a data analysis update, and 2) a model update. The data analysis update is performed at least every five years. Model updates consist of either single or multiple PSA changes and are performed at a frequency dependent on the estimated impact of the accumulated changes. Guidelines to determine the need for a model update are provided in the standard.

PSA Software

All computer programs that process PSA model inputs are verified and validated as needed. The RRAG policy on verification and validation of QA controlled/procured software, as well as the verification and validation for software and computers when used for Quality Related applications are described in the RRAG Standard, "Probability Safety Assessment Software Control Procedure." This standard provides a list of all the software used by the RRAG and indicates whether the software is QA controlled/procured. Software verification is the process used to ensure the software meets the software requirement specifications. The PSA software that is procured with a QA option, and is developed under a 10 CFR 50, Appendix B, QA program, does not require further software verification by the RRAG.

Validation of software is performed for different conditions such as: 1) a new installation of software, 2) any new database or configuration file changes issued by the RRAG, 3) unreasonable results, 4) change in computer configuration (software, hardware), or 5) use of software for Quality Related applications for the first time. Validation requirements for each Quality Related PSA computer program are documented in a Software Verification/Validation Plan (SVVP) procedure. These requirements include the method of validation, the frequency of validation, the documentation required and the acceptance criteria. A SVVP procedure is submitted for each program. Actual validation benchmark problems can exercise more than one program, but a separate Software Verification/Validation Report (SVVR) must be submitted for

each program. Each SVVP procedure and SVVR is independently reviewed and then approved by the RRAG supervisor. Software validation tests both the software and the hardware. Validation tests are also performed following any significant change in the hardware, operating system, or program, or if the validation period established in the SVVP procedure expires.

PSA Reviews

There have been numerous reviews of the Turkey Point PSA, dating back to the original IPE, which had multiple levels of review. The first consisted of normal engineering quality assurance practices carried out by the organization performing the analysis. A qualified individual with knowledge of PSA methods and plant systems performed an independent review of the results for each task. This represented a detailed check of the input to the PSA model and provided a high degree of quality assurance.

The second level of review was performed by plant personnel not directly involved with the development of the PSA model. This review was performed by individuals from Operations, Technical Staff, Training, and the Independent Safety Engineering Group, who reviewed the system description notebooks and accident sequence description. This provided diverse expertise with plant design and operations knowledge to review the system descriptions for accuracy.

The third level of review was performed by PSA experts from ERIN Engineering. This review provided broad insights on techniques and results based on experience from other plant PSAs. The review team reviewed the PRA development procedures, as well as the output products.

Comments obtained from all the review sources were incorporated, as appropriate, into the work packages, and the final product. Following the Turkey Point IPE submittal to the NRC on June 25, 1991, it was reviewed extensively by the NRC and NRC contractors. In fact, the Turkey Point IPE was one of the few IPE submittals to receive a Step 1 and a Step 2 review by the NRC. The Step 2 review consisted of a team of NRC representatives and contractors visiting FPL to conduct a week-long, extensive review of the Turkey Point IPE. Following these reviews, the Turkey Point IPE was revised in early 1992, and FPL received the NRC Safety Evaluation Report (SER) for the Turkey Point IPE on October 15, 1992. The SER concluded that the Turkey Point IPE had met the intent of GL 88-20.

In January 2002, the Turkey Point PSA model underwent an official peer review conducted by Westinghouse using PSA contractors and utility PSA analysts. This review produced two "A" Facts and Observations (F&Os) and 29 "B" F&Os. All of the "A" findings have been resolved, and all but four of the "B" level findings have been resolved. Two of these "B" findings are documentation issues, and therefore have no impact on this analysis. One is a Level 2 issue,

which suggests performing a sensitivity analysis on a Containment Event Tree top event probability. Given the margin of the ICLERP in this application and the fact that the F&O only asks for a sensitivity analysis, this is extremely unlikely to have any impact. The last "B" F&O is an internal flooding issue. The F&O simply states that the reduction in the internal events CDF as a result of refinements and updates of the model since the original IPE has now made the original IPE internal flooding analysis CDF of 5E-7 per year a more significant contributor to the overall CDF. While this is true, there are factors that need to be considered. One is the fact that the internal flooding CDF is still only about 8% of the internal events CDF. Two, the internal flooding analysis was a screening-type analysis, which typically gives a conservative result. Third, the focus of this application is the ICW pumps, which are located in the intake structure, which has no potential for internal floods. Therefore, the remaining open "B" F&Os are judged to have no effect on the conclusions of this analysis of the risk associated with the extension of the ICW pump TS AOT.

5.4.1.1 Delta CDF/Delta LERF

RG 1.177 recommends that the ΔCDF and ΔLERF associated with the proposed AOT extension be calculated. A bounding analysis was performed to assess the impact of the proposed AOT extension on the average CDF and LERF values. The ICW pump unavailabilities were increased by adding the equivalent of a 14-day outage each year to the current historical unavailability (6.05E-03) for each ICW pump, as shown below.

Bounding Unavailability = 6.05E-03 + (14 days / (365 days/year * 0.9)) = 0.049

The 0.9 factor was used to approximate the portion of the year the unit is online.

Calculations using the Turkey Point PSA model were run using the nominal, historical ICW pump unavailability and the bounding ICW pump unavailability calculated above in order to calculate bounding estimates of the ΔCDF and ΔLERF associated with the AOT increase. These calculations were run for two different configurations of the 4160V 3[4]D Bus, i.e., whether this bus is aligned to the 4160V 3[4]A Bus or the 4160V 3[4]B Bus. In accordance with plant operational procedures and Turkey Point 3 and 4 TSs, when ICW pump 3[4]A is taken out of service, the 4160V 3[4]D Bus is aligned to 4160V 3[4]A Bus, and ICW pump 3[4]C is aligned to ICW Train 3[4]A. Similarly, when ICW pump 3[4]B is taken out of service, the 4160V 3[4]D Bus is aligned to the 4160V 3[4]B Bus, and ICW pump 3[4]C is aligned to ICW Train 3[4]B. The results are shown below in Table 1.

Table 1 - ΔCDF and ΔLERF Calculations

	D-Bus Aligned to A		**D-Bus Aligned to B**	
Case	**CDF/yr**	**LERF/yr**	**CDF/yr**	**LERF/yr**
Baseline	6.10E-06	3.79E-07	6.14E-06	3.79E-07
Bounding ICW Pump Unavailabilities	6.63E-06	3.79E-07	6.70E-06	3.79E-07
ΔCDF/ΔLERF	5.27E-07	2.31E-10	5.68E-07	2.94E-10
% Increase	9%	0.1%	9%	0.1%

The increases in Core Damage Frequency (CDF) were estimated to be 5.27E-07/yr, or 9%, for the 3[4]D to 3[4]A bus alignment, and 5.68E-07/yr, or 9%, for the 3[4]D to 3[4]B bus alignment. The increases in Large Early Release Frequency (LERF) were estimated to be 2.31E-10/yr, or 0.1%, for the 3[4]D to 3[4]A bus alignment, and 2.94E-10/yr, or 0.1%, for the 3[4]D to 3[4]B bus alignment. Even with the bounding assumption of an extra 14 days per year of unavailability per ICW pump, these ΔCDFs and ΔLERFs reside in Region III (the least risk-significant region) of Figures 3 and 4 of RG 1.174.

5.4.1.2 Incremental Conditional Core Damage Probability (ICCDP)/Incremental Conditional Large Early Release Probability (ICLERP)

RG 1.177 provides quantitative acceptance guidelines for the risk impact associated with AOT changes to be considered small as an ICCDP of 5.0E-07 or less, and an ICLERP of 5.0E-08 or less.

ICCDP and ICLERP are defined below.

ICCDP = [(conditional CDF with the subject equipment out of service) - (baseline CDF with nominal expected equipment unavailabilities)] * (duration of single AOT under consideration).

ICLERP = [(conditional LERF with the subject equipment out of service) – (baseline LERF with nominal expected equipment unavailabilities)] * (duration of single AOT under consideration).

Table 2 provides a summary listing of the cases run to calculate the ICCDPs and ICLERPs.

Table 2 - ICCDP/ICLERP Cases

		D-Bus Aligned to A		D-Bus Aligned to B	
Pump OOS	Maintenance Type	CDF (per year)	LERF (per year)	CDF (per year)	LERF (per year)
Baseline		6.10E-06	3.79E-07	6.14E-06	3.79E-07
3[4]A	CM	1.62E-05	3.86E-07	N/A. Per TS, Operations will only align 3[4]D-BUS to 3[4]A and ICWP-3[4]C to ICW Train 3[4]A	
3[4]A	PM	6.51E-06	3.79E-07		
3[4]B	CM	N/A. Per TS, Operations will only align 3[4]D-BUS to 3[4]B and ICWP-3[4]C to ICW Train 3[4]B		1.61E-05	3.86E-07
3[4]B	PM			6.49E-06	3.79E-07
3[4]C	CM	1.58E-05	3.86E-07	1.58E-05	3.86E-07
3[4]C	PM	6.23E-06	3.79E-07	6.235E-06	3.79E-07

The results provided in Table 2 above were used to calculate the ICCDP and ICLERP for the requested AOT of fourteen (14) days. Table 3 provides a summary of the ICCDP and ICLERP results for each pump, alignment, and type of maintenance.

Table 3 - ICCDP and ICLERP Results

	D-Bus Aligned to A		D-Bus Aligned to B	
Pump OOS	ICCDP	ICLERP	ICCDP	ICLERP
Corrective Maintenance				
3A	3.87E-07	3.02E-10	N/A	N/A
3B	N/A	N/A	3.84E-07	3.01E-10
3C	3.73E-07	2.89E-10	3.72E-07	2.89E-10
Preventive Maintenance				
3A	1.55E-08	1.26E-11	N/A	N/A
3B	N/A	N/A	1.37E-08	1.23E-11
3C	4.76E-09	7.19E-13	3.79E-09	4.82E-13

5.4.1.3 Internal Fire PRA

The Fire Induced Vulnerability Evaluation (FIVE) methodology for fire risk screening has been enhanced by the industry to include a more detailed assessment of the severity factors, fire modeling, and fire protection compensatory actions. Turkey Point fire protection features have also been improved by hardware changes (e.g., a fire suppression system to mitigate turbine fires in the Turbine Building).

Specific risk insights of refining the Turkey Point Individual Plant Examination of External Events (IPEEE) fire risk for the cable spreading room and control room provide reasonable assurance that the fire risk for those areas is very low. The Turkey Point IPEEE concluded that there were no severe accident vulnerabilities due to internal fires.

The revised fire risk estimates for the cable spreading room and control room are at least two orders of magnitude lower than that reported in the original Turkey Point IPEEE.

Although the IPEEE fire risk model has not been updated, applicable fire risk insights can still be obtained by reviewing the nature of the fire risk contributors for risk-significant fire zones.

A review of the fire risk contributors provides key insights relative to a potential risk increase due to fires associated with the proposed TS AOT extension for one ICW pump:

1. The extension of the TS AOT for the ICW pumps is an administrative change only and does not have any significant impact on the likelihood of occurrence of fires at Turkey Point, or on their location within the plant.
2. The only purpose for the ICW pumps (relative to plant safety) is to provide cooling water to safeguards equipment.
3. The likelihood of a fire resulting in a complete loss of cooling water is low at Turkey Point.

The IPEEE analysis identified six risk-significant fire zones, i.e., control room, cable spreading room, 480V motor control center rooms (fire zones 63 and 61), and intake structures (fire zones 119 and 120). The incremental risk from fire in any of these fire areas with one ICW pump being out of service is small, because two trains of ICW pumps are available or the fire-induced CCDP is not significantly affected. The capability to avoid the fire-related loss of cooling water events is due to the availability of the other ICW pumps and cross-tie capability of the opposite unit CCW. Even if the fire of concern occurs during the small fraction of the year in which the other ICW pump is assumed to be unavailable for maintenance, the capability to cross-tie the CCW from the opposite unit would remain available. Therefore, the additional plant risk from fire induced loss of cooling water events due to the proposed extended AOT is very low.

Based on a review of the dominant cutsets associated with loss of one ICW pump, the following conditions or basic events are involved:

1. loss of offsite power, or
2. loss of the other ICW pumps (CCF dominates)
3. failing to provide long-term heat removal (Refueling Water Storage Tank (RWST) cross-tie or long-term recirculation)

Fire scenarios (except fire zones 119 and 120, which are addressed separately below) are not expected to increase the likelihood (probability or frequency) of these basic events used in the internal PRA model. For example, the frequency of loss of offsite power is 5.0E-2/yr in the internal event PRA model; the likelihood of a fire in most fire areas, progressing to the point of losing offsite power is at least a factor of 5 or more smaller assuming a fire ignition frequency of 1.0E-2/yr. The challenging fire severe enough without being suppressed before it leads to a loss of offsite power is at least a factor of 10 or so less, i.e., 1.0E-3/yr. In addition, the PSA model used for this LAR does not credit the operator action to use the opposite unit's CCW. Cross-connecting CCW between units is done using *-ONOP-030 steps 34-40 when none of the pumps on the affected unit will establish CCW flow. As a scoping fire analysis, assuming that the fire-induced risk is as high as that from the internal events, if the credit to the CCW is assumed to reduce the delta CDF and delta LERF by a factor of 10, then the incremental CDP and incremental LERP are 10% of that due to the internal events only.

Fire zones 119 and 120 require a special consideration, as it appears that the proximity of the ICW pumps may increase the fire risk. A simplified scoping estimate follows based on a review of the scoping calculation done in the IPE submission and a review of the CCDP of loss of ICW as an initiator.

The IPEEE fire risk study for intake structure fires did not take credit for the changes made (e.g., all three charging pumps now have hose-connections to connect service water for pump cooling). In addition, RWST replenishment or continuous injection was not explicitly credited. A severity factor of 0.1 was used for pump damage. Based on a scoping CCDP of 1.0E-4 (which is bounding) for a total loss of ICW and the probability of an intake structure fire, say 1.0E-2/yr, and a severity factor of 0.1, the incremental fire risk is approximately 1.0E-7/yr. If a 14-day AOT extension is assumed, the ICCDP would be another order of magnitude lower, approaching 1.0E-8. Additional mitigating factors may lower the risk estimates further, as the CCDP estimate of 1.0E-4 does not credit using the other unit's CCW, if needed.

5.4.1.4 Other External Events

In addition to examining the CDF and LERF from internal events, external events were reviewed.

At the outset, it should be noted that the CDF estimates for storm surges in the 1991 Turkey Point IPE were extremely conservative estimates that overestimated risk for screening purposes. Further, those estimates predated plant and procedural improvements (such as the many changes made to reduce hurricane risk after Hurricane Andrew), as well as improvements in modeling. Consequently, the risk from storm surges is believed to be orders of magnitude below the very conservative 1991 screening estimates. As a general matter, risk of core damage from external events at Turkey Point is very small, to the point of being remote and speculative, and external events are not considered a significant contributor to core damage and overall risk.

The Turkey Point IPEEE and recent experience in reviewing the estimated risk associated with other external events including hurricanes and earthquakes has demonstrated the following:

1. In general, the methodology and the data used for the Turkey Point IPEEE are for screening purposes, and are therefore very conservative.
2. Plant procedures (e.g., to prepare for hurricanes and to reduce risk for fire related initiators) and design are aimed at reducing risk. The limitations of the Turkey Point IPEEE screening methods make it impractical, if not impossible, to quantify these mitigating factors as accurately as that for internal events.
3. More recent advances in understanding and modeling of risk indicate that such risks have been overestimated.

The risk from other external events is discussed below.

Hurricanes

From the risk perspective, the following discussion shows that the severe accident risk contribution from hurricanes is also very small and is already minimized as much as practical.

From a severe accident risk perspective, hurricanes are much less significant than other external events, because they develop slowly and with advance warning that allows both preparation for and elimination of accident sequences. For example, many accident scenarios such as LOCAs, SGTR, and ATWS are reduced significantly or totally eliminated for Turkey Point because, as required by plant procedures, the units are placed in a shutdown condition prior to the onset of a hurricane. The decay heat is therefore reduced by a factor of two to three depending on when the

loss of critical safety functions is postulated. The time available to take actions after hurricane-induced failures is thus increased, significantly reducing the core damage frequency.

Earthquakes

The Turkey Point IPEEE submission for seismic risk was based on the seismic analysis resolving USI A-46. The Turkey Point IPEEE submission indicated that the seismic risk was perceived to be low.

A plant-specific seismic adequacy evaluation identified components as seismic outliers. These outliers were addressed by implementing relevant plant improvements or procedures. The capacities of Condensate Storage Tanks (CSTs) and RWSTs were evaluated and determined to meet the seismic design basis of 0.15g PGA (Peak Ground Acceleration).

For earthquakes beyond design basis accidents, the quantified risk is very conservative to compensate for the uncertainties in the seismic hazard and seismic fragility. Nevertheless, given the large safety factor generally embedded in the seismic design, in combination with measures taken in the resolution of A-46 issues, the seismic risk is expected to be low for Turkey Point.

Based on the above, the seismic risk is low and dominated by the uncertainties associated with the likelihood of the earthquakes beyond the design basis of 0.15g PGA.

Tornadoes and Other External Events

The core damage frequency contribution from external events reported in the Turkey Point IPEEE submission (tornado, transportation and nearby facilities, and others) is estimated to be less than 1.0E-06/yr. The capability to cross-tie the other unit was not credited in the Turkey Point IPEEE submission.

Conclusion – External Events

In summary, the risk due to all other external events has been evaluated in light of the more recent advances in procedural enhancements and refined modeling. Although the risk from the other external events is not quantified with the same level of detail and accuracy as that from the internal events, the external events risk is expected to be lower than that of the internal events risks.

5.4.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

There is reasonable assurance that risk-significant equipment configurations will not occur when specific plant equipment is out of service consistent with the proposed TS change. Increases in risk posed by potential combinations of equipment out of service will be managed under the Configuration Risk Management Program (CRMP).

5.4.3 Tier 3: Risk-Informed Configuration Risk Management Program

While in the extended ICW pump AOT, overall plant risk will be managed by the existing Maintenance Rule (a)(4) program. This program utilizes the Equipment Out of Service software to evaluate unique plant configurations. Turkey Point plant procedure 0-ADM-225, On Line Risk Assessment and Management, addresses the actions required to be taken at each risk level. The Work Controls department assesses and manages the risk of work week activities in advance, while control room personnel assess and manage the risk of emergent work.

5.4.4 Maintenance Rule Program

To ensure the proposed extension of the ICW pump AOT does not degrade operational safety over time, the Maintenance Rule (MR) requires an evaluation when equipment covered by the MR does not meet its performance criteria. The reliability and availability of the ICW pumps are monitored under the MR program. If the pre-established reliability or availability performance criteria are exceeded for the ICW pumps, they are considered for 10 CFR 50.65(a)(l) actions. These actions require increased management attention and goal setting in order to restore their performance to an acceptable level. The actual out of service time for the ICW pumps will be minimized to ensure that the reliability and availability performance criteria are met.

5.5 Technical Analysis Conclusions

RG 1.177 provides quantitative acceptance guidelines for the risk impact associated with AOT changes to be considered small as an ICCDP of 5.0E-07 or less, and an ICLERP of 5.0E-08 or less. The ICCDPs and ICLERPs calculated for each ICW pump for the proposed ICW pump AOT extension are provided in Table 3. All of the values calculated for ICCDP and ICLERP were below the respective RG 1.177 values representing a small risk impact.

The ICCDP for the preventive maintenance case is approximately 1.6E-08. The ICCDP for the corrective maintenance case is approximately 3.9E-07. These two values reflect internal events' contributions. The PSA model used for this LAR does not credit the operator action to use the opposite unit's CCW. As a scoping analysis to estimate the risk associated with the external events, assuming that the external-events risk is as high as that from the internal events, if the

credit to the CCW is assumed to reduce the delta CDF and delta LERF by a factor of 10, then the total incremental CDP and LERP is 1.1 times that due to the internal events only. The total ICCDP of approximately 4.4E-7, including the contribution from the internal events and that estimated 10% extra due to the contribution from external events, is below the RG 1.177 guideline of 5.0E-07. The ICLERPs for the preventive and corrective maintenance cases are both substantially below the RG 1.177 definition of a "small quantitative impact on plant risk" for ICLERP of 5.0E-08.

RG 1.177 also recommends that the ΔCDF and ΔLERF associated with the AOT extension be calculated. The increases in Core Damage Frequency (CDF) were estimated to be 5.27E-07/yr, or 9%, for the 3[4]D to 3[4]A bus alignment, and 5.68E-07/yr, or 9%, for the 3[4]D to 3[4]B bus alignment. The increases in Large Early Release Frequency (LERF) were estimated to be 2.31E-10/yr, or 0.1% for the 3[4]D to 3[4]A bus alignment, and 2.94E-10/yr, or 0.1% for the 3[4]D to 3[4]B bus alignment. Even with the bounding assumption of an extra 14 days per year of unavailability per ICW pump, these ΔCDFs and ΔLERFs reside in Region III (the least risk-significant region) of Figures 3 and 4, respectively, of RG 1.174.

Based on the calculated values for ICCDP and ICLERP for each ICW pump for an AOT duration of 14 days, the bounding estimate of the ΔCDF and ΔLERF associated with the proposed AOT extension, and the guidance in RG 1.177 and RG 1.174, it is concluded that the risk impact of the proposed AOT extension is small.

Current TS 3.7.3, Action a, requires a unit to shutdown after an ICW pump has been inoperable for 7 days. This license amendment application requests extension of the AOT by an additional 7 days. From deterministic and probabilistic perspectives, the risk of extending the AOT for an additional 7 days is low.

Based on the above discussion, operation of the Turkey Point Nuclear Plant with the proposed TS change does not adversely affect nuclear safety or plant operations and the health and welfare of the public is protected.

6.0 REGULATORY ANALYSIS

Existing TS Actions require a plant shutdown if an ICW pump is not returned to an operable status within the 7-day AOT. The PRA analysis has shown that the increase in risk from extending the AOT from 7 to 14 days is less than the threshold criteria specified in RG 1.177.

In conclusion, based on the considerations above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2)

such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

7.0 DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

Description of amendment request:

The proposed license amendment to Facility Operating Licenses DPR-31 and DPR-41 for Turkey Point Units 3 and 4, respectively, will revise the TSs to allow an extension of the current AOT for an inoperable ICW pump from 7 days to 14 days.

Pursuant to 10 CFR 50.92, a determination may be made that a proposed license amendment 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; (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 consideration is discussed below.

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

   Response: No.

   The proposed change affects the AOT for TS 3.7.3, Action a. The proposed change allows an extension of the current AOT for an inoperable ICW pump from 7 days to 14 days. The proposed change does not affect the design of the ICW System, the operational characteristics or function of the ICW System, the interfaces between the ICW System and other plant systems, or significantly affect the reliability of the ICW System. Limiting conditions for operation and their associated allowed outage times are not considered initiating conditions for any accident previously evaluated, nor is the ICW System considered an initiator for any accident previously evaluated. The ICW System provides the cooling water to the safety related CCW heat exchangers. The ICW System also provides cooling water to the TPCW heat exchangers and supplies water to the Lube Water System. During accident conditions, the ICW System performs the accident mitigation function of removing the heat load from the CCW System to support both reactor heat removal and containment heat removal requirements. The consequences of accidents previously evaluated are not affected by the proposed change in AOT. To fully evaluate the effect of the proposed ICW AOT extension, PRA methods and a deterministic analysis were utilized. The results of the

analysis show no significant increase in Core Damage Frequency or Large Early Release Frequency based upon the guidance provided in Regulatory Guides 1.174 and 1.177.

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

2. Does the proposed change create the probability of a new or different accident from any accident previously evaluated?

   Response: No.

   The proposed change does not involve a change in the design, configuration, or method of operation of the plant. The proposed change will not alter the manner in which equipment operation is initiated, nor will the functional demands on credited equipment be changed. The proposed change allows operation of a Turkey Point unit to continue while an ICW pump is repaired and tested. The proposed extension does not affect the interaction of an ICW pump with any system whose failure or malfunction can initiate an accident. As such, no new failure modes are being introduced.

   Therefore, the proposed action does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

   Response: No

   The proposed change does not alter the plant design, nor does it affect the assumptions contained in the safety analyses. Specifically, there are no changes being made to the ICW design, including instrument setpoints. The proposed change has been evaluated both deterministically, and using risk-informed methods. Based upon these evaluations, margins of safety ascribed to ICW availability and to plant risk have been determined to not be significantly reduced. The evaluation has concluded the following with respect to the proposed change:

   Applicable regulatory requirements will continue to be met, adequate defense-in-depth will be maintained, sufficient safety margins will be maintained, and any increases in CDF and LERF are small and consistent with the NRC Safety Goal Policy Statement (Federal Register, Vol.5.1, P. 30028 (51 FR 30028), August 4, 1986) as interpreted by NRC Regulatory Guides 1.174 and 1.177. Furthermore, increases in risk posed by potential combinations of equipment out of service during the proposed extended ICW pump AOT

will be managed under a configuration risk management program consistent with 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," paragraph (a)(4).

The availability of the other ICW pumps and the use of on-line risk assessment tools provide adequate compensation for the potential small incremental increase in plant risk associated with the extended ICW pump AOT.

Therefore, the proposed change does not involve a significant reduction in margin of safety.

Based on the above, FPL concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is justified.

8.0 ENVIRONMENTAL CONSIDERATION

The proposed license amendment changes requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The proposed amendment involves no significant increase in the amounts and no significant change in the types of any effluents that may be released offsite, and no significant increase in individual or cumulative occupational radiation exposure. FPL concluded that the proposed amendment involves no significant hazards consideration and meets the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) and that, pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment need not be prepared in connection with issuance of the amendment.

ATTACHMENT 2

Turkey Point Units 3 and 4

Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

License Amendment Request No. 186

Intake Cooling Water Pump Allowed Outage Time Change

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PLANT SYSTEMS

3/4.7.3 INTAKE COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with:

a. Three ICW pumps, and
b. Two ICW headers.

APPLICABILITY: MODES 1, 2, 3, and 4.

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ACTION:

a. With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within X days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable.

b. With only one ICW pump OPERABLE or with two ICW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With only one ICW header OPERABLE, restore two headers to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3 The Intake Cooling Water System (ICW) shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position is in its correct position; and

b. At least once per 18 months during shutdown, by verifying that:

1) Each automatic valve servicing safety-related equipment actuates to its correct position on a SI test signal, and

2) Each Intake Cooling Water System pump starts automatically on a SI test signal.

3) Interlocks required for system operability are OPERABLE.

ATTACHMENT 3

Turkey Point Units 3 and 4

Docket Nos. 50-250 and 50-251
License Nos. DPR-31 and DPR-41

License Amendment Request No. 186

Intake Cooling Water Pump Allowed Outage Time Change

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3/4.7.3 INTAKE COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 The Intake Cooling Water System (ICW) shall be OPERABLE with:

a. Three ICW pumps, and
b. Two ICW headers.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With only two ICW pumps with independent power supplies OPERABLE, restore the inoperable ICW pump to OPERABLE status within 14 days or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. The provisions of Specification 3.0.4 are not applicable.

b. With only one ICW pump OPERABLE or with two ICW pumps OPERABLE but not from independent power supplies, restore two pumps from independent power supplies to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c. With only one ICW header OPERABLE, restore two headers to OPERABLE status within 72 hours or be in HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.7.3 The Intake Cooling Water System (ICW) shall be demonstrated OPERABLE:

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1) Each automatic valve servicing safety-related equipment actuates to its correct position on a SI test signal, and

2) Each Intake Cooling Water System pump starts automatically on a SI test signal.

3) Interlocks required for system operability are OPERABLE.