PMTurkeyCOLPEm Resource

From: Comar, Manny
Sent: Tuesday, August 30, 2011 9:27 AM
To: TurkeyCOL Resource
Subject: FW: L-2011-340 RAI Ltr 22 eRAI 5403 Response_rev 1
Attachments: L-2011-340 Signed 08-29-2011 RAI Ltr 22 eRAI 5403 Response_rev 1.pdf

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From: CHILDRESS, ELWOOD [mailto:ELWOOD.CHILDRESS@fpl.com]
Sent: Tuesday, August 30, 2011 8:30 AM
To: Matthews, David; Maher, William; Comar, Manny; Stewart, Scott; McCree, Victor
Subject: L-2011-340 RAI Ltr 22 eRAI 5403 Response_rev 1

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Re: Florida Power & Light Company
Proposed Turkey Point Units 6 and 7
Docket Nos. 52-040 and 52-041
Revision to the Response to NRC Request for Additional Information Letter No. 022 (eRAI 5403) - Standard Review Plan Section 09.02.02 Reactor Auxiliary Cooling Water System

Reference:

1. NRC Letter to FPL dated May 18, 2011, Request for Additional Information Letter No. 022 Related to SRP Section 09.02.02 – Reactor Auxiliary Cooling Water System for the Turkey Point Nuclear Plant Units 6 and 7 Combined License Application

2. FPL Letter to NRC dated June 14, 2011, Schedule for Response to NRC Request for Additional Information Letter No. 022 (eRAI 5403) - Standard Review Plan Section 09.02.02 Reactor Auxiliary Cooling Water System

3. FPL Letter to NRC dated June 24, 2011, Response to NRC Request for Additional Information Letter No. 022 (eRAI 5403) - Standard Review Plan Section 09.02.02 Reactor Auxiliary Cooling Water System

Florida Power & Light Company (FPL) provided its response to the Nuclear Regulatory Commission's (NRC) Request for Additional Information (RAI) 09.02.02-1 provided in the referenced letter (Reference1) on June 24, 2011 (Reference 3).

Subsequent to the submittal of the response to RAI 09.02.02-1, it was discovered that the Turkey Point Units 6 & 7 site specific maximum ambient dry bulb temperature value was incorrectly stated in two (2) places as 112ºF instead of the correct value, 103ºF. It has been determined that the stated incorrect maximum ambient dry bulb temperature envelopes the lower corrected value. Therefore, the correction to the maximum ambient dry bulb temperature value from 112ºF to 103ºF does not alter the previously reported conclusions.

FPL provides, as an attachment to this letter, its revised response to the NRC RAI 09.02.02-1 provided in the referenced letter (Reference 1). The attachment identifies changes that will be made in a future revision of the Turkey Point Units 6 and 7 Combined License Application (if applicable).

Tom Childress

561-694-4443

cell 315-396-3031

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August 29, 2011

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FPL provides, as an attachment to this letter, its revised response to the NRC RAI 09.02.02-1 provided in the referenced letter (Reference 1). The attachment identifies changes that will be made in a future revision of the Turkey Point Units 6 and 7 Combined License Application (if applicable).

If you have any questions, or need additional information, please contact me at 561-691-7490.

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

Executed on August 29, 2011.

Sincerely,

William Maher
Senior Licensing Director – New Nuclear Projects

WDM/ETC

Attachment 1: FPL Revised Response to NRC RAI No. 09.02.02-1 (RAI 5403)

cc:
PTN 6 & 7 Project Manager, AP1000 Projects Branch 1, USNRC DNRL/NRO
Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant 3 & 4

NRC RAI Letter No. 22 Dated May 18, 2011

SRP Section: 09.02.02 – Reactor Auxiliary Cooling Water System

Application Section: 9.2.2 - Component Cooling Water System

Question from Balance of Plant Branch 1 (SBPA)

NRC RAI Number: 09.02.02-1 (eRAI 5403)

In the PTN COL Application, Part 7, Departures and Exemptions, PTN DEP 2.0-3, the applicant evaluated and justified the change to the maximum safety wet bulb (noncoincident) air temperature of 87.4 °F. This corresponding site characteristic value exceeds the AP1000 DCD site parameter by 1.3 °F. The departure justification was performed on the following components/systems.

- Containment pressure design limits
- IRWST temperature control with normal residual heat removal system
- Component cooling water system
- Nuclear Island nonradioactive ventilation system capability

In response to VC Summer RAI 09.02.02-1 regarding a similar maximum safety wet bulb air temperature departure on the VC Summer COL application, the VC Summer applicant performed an analysis of the maximum safety wet bulb (non-coincident) air temperature at a bounding value of 87.4 °F and docketed this analysis in VSP-VSG-000706, June 30, 2010, “Evaluation of Impacts – Change to Maximum Safety Non-Coincident Ambient Wet Bulb Temperature for the VC Summer Site.” (ML101830391) The VC Summer departure analysis encompassed a broader array of components/systems than those listed above.

The NRC staff also evaluated a maximum safety wet bulb air temperature change proposed in Revision 16 to the AP1000 DCD submittal, which was documented in APPGW- GLE-036, "Impact of a revision to the current Wet Bulb Temperature identified in Table 5.0-1 (Tier 1) and Tier 2 Table 2-1 (Sheet 1 of 3) of the DCD (Revision 16)," in order to encompass the Levy and Turkey Point 6 and 7 sites. This AP1000 change was also evaluated for impact on a broader array of components/systems than those listed above.

Justify departure PTN DEP 2.0-3 in a manner that encompasses the components/systems considered in the VC Summer response to RAI 09.02.02-1 in its June 30, 2010 Letter to NRC NND-10-0254 (ML101830391) and the above AP1000 justification and evaluation, or explain why justification with respect to those components/systems is not necessary. Specifically, the departure/exemption evaluation should include the impact on:

- The performance of passive containment cooling system
- Passive heat sinks associated with the main control room habitability system

- Normal, decay, and spent fuel pool heat removal
- HVAC design
- Chiller water system design (to include High and Low Capacity Subsystems)
- Component cooling and service water system design
- Steam and power conversion
- Circulating water system and turbine building closed cooling water system design

In addition, specific to PTN COL FSAR Section 5.4.7, "Normal Residual Heat Removal System," the applicant incorporated by reference DCD Section 5.4.7 with the exception of the following departure in Subsection 5.4.7.1.2.3:

- PTN DEP 2.0-3 The component cooling water system supply temperature to the normal residual heat removal system heat exchangers is based on an ambient design wet bulb temperature of no greater than 87.4°F (100 year return estimate of 2-hour duration). The 87.4°F value is assumed for normal conditions and transients that start at normal conditions.

With plant operation at the design limit and the ambient design wet bulb temperature at the proposed 87.4°F, describe whether the CCW have sufficient heat removal capacity such that the RNS remains within the design basis as described in DCD Subsection 5.4.7.1, and provide a discussion of the evaluation performed that confirms the following subsections:

A. Subsection 5.4.7.1.2.1, confirming that the normal residual heat removal system reduces the temperature of the reactor coolant system from 350°F to 125°F within 96 hours after shutdown and the RNS system maintains the reactor coolant temperature at or below 125°F for the plant shutdown;

B. Subsection 5.4.7.1.2.3, confirming that the RNS system limits the in-containment refueling water storage tank water temperature to less than boiling temperature during extended operation of the passive residual heat removal system and not greater than 120°F during normal operation.

FPL RESPONSE:

AP1000 DCD Revision 19 Table 5.0-1 Tier 1 and Table 2-1 (sheet 1 of 3) Tier 2 provide listings of standard values for site environmental parameters. The maximum safety wet bulb (noncoincident) air temperature for the Turkey Point Units 6 & 7 site was calculated for expected conditions at the site and increased from the standard value of 86.1^{o}F to 87.4^{o}F. The maximum normal wet bulb (noncoincident) air temperature value was also increased from 80.1^{o}F to 81.5^{o}F.

These changes required an evaluation of the various plant performance requirements and commitments affected by each parameter to confirm that the performance of the

plant's safety and non-safety systems remain within the bounds described in the AP1000 DCD, and if necessary, identify changes to the design that are needed to ensure that performance is restored to within acceptable bounds.

The following sections in the AP1000 DCD describe areas that could be affected by an increase in the maximum safety wet bulb (noncoincident) air temperature.

- DCD Section 6.2.2, Passive Containment Cooling System Performance
- DCD Section 5.4.7.1.2.1, Normal Residual Heat Removal System – Shutdown Heat Removal
- DCD Section 5.4.7.1.2.3, Normal Residual Heat Removal System – In-Containment Refueling Water Storage Tank Cooling
- DCD Section 9.1.3.1.3.1, Spent Fuel Pool Cooling – Partial Core – Plant at Power
- DCD Section 9.2.1.1.2, Service Water System Power Generation Design Basis
- DCD Section 9.2.1.1.2.3, Service Water System Power Operation
- DCD Section 9.2.2.1.2.1, Component Cooling Water – Normal Operation Temperature Limit
- DCD Section 9.2.7.2.4, Central Chilled Water System – Normal Operation
- DCD Section 9.2.8.1.2, Turbine Building Closed Cooling Water System Power Generation Design Basis

The impacts were evaluated on a system by system basis. The same type of analyses have been performed twice previously for two required increases in AP1000 standard site wet bulb temperature conditions, and once to justify a departure for a specific site whose site wet bulb temperature conditions exceeded the standard site temperature conditions documented in the DCD.

The areas that could be affected by the increased maximum safety wet bulb (noncoincident) air temperature at the Turkey Point Units 6 & 7 site include:

- Passive containment cooling system (PCS) design and performance
- Component cooling system (CCS) and service water system (SWS) design and performance
- Spent fuel cooling system (SFS) design and performance (fuel shuffle refueling with return to power, 407 hours after shutdown)
- Turbine building closed cooling water system (TCS) design and performance
- In-Containment Refueling Water Storage Tank (IRWST) temperature control
- Nuclear Island non-radioactive ventilation system (VBS) design and performance
- Passive heat sinks associated with the Main Control Room Habitability System (VES)

- RTNSS (Regulatory Treatment of Non-Safety Systems) system availability and decay heat removal capability of SWS and CCS during RCS reduced-inventory operation in Modes 5 and 6

The results of evaluations performed for each of the areas listed above are discussed in order below.

Passive Containment Cooling System Design and Performance (FSAR Section 6.2.2)

Evaluations performed for Turkey Point (Westinghouse calculation note TPG-GW-GSC-001 Revision 0, *WGOTHIC Containment Peak Pressure Analysis for the Evaluation of FP&L Turkey Point COL Maximum Wet Bulb Temperature Departure from DCD*) and for the standard AP1000 plant design (APP-GW-GSC-040 Revision 0) demonstrate that the AP1000 accident analysis cases of record bound the performance expected at the Turkey Point site maximum safety wet bulb (noncoincident) air temperature of 87.4^{o}F. Recent modifications to the WGOTHIC model to address a scaling issue do not affect this conclusion.

The pressure decay curve for the containment is essentially identical for wet bulb air temperatures equal to the standard maximum safety wet bulb (noncoincident) air temperature value and the Turkey Point value. The containment response for Turkey Point Units 6 & 7 at the site maximum safety wet bulb (noncoincident) air temperature will therefore be essentially identical to the standard containment response.

There are no changes to the design of AP1000 safety systems made necessary by the increased maximum safety wet bulb (noncoincident) air temperature at the Turkey Point Units 6 & 7 site.

Component Cooling System and Service Water System Design and Performance (FSAR Sections 5.4.7.1.2.1, 9.2.1.1.2, 9.2.1.1.2.3, and 9.2.2.1.2.1,)

The limiting temperature performance for the CCS and SWS occurs during normal power operation, with the site ambient wet bulb temperature assumed to be at the maximum safety wet bulb (noncoincident) value. The AP1000 DCD maximum safety wet bulb (noncoincident) air temperature was originally defined to be the annual “0% exceedence” value measured at or calculated for the site. This measure of temperature is based on the maximum observed wet bulb temperature value reached at a site, excluding periods of higher temperature extending less than 2 hours duration. For Turkey Point Units 6 & 7, the site maximum safety wet bulb (noncoincident) air temperature value is defined as the 100-year return value for this parameter, excluding peaks of less than 2 hours duration.

The original AP1000 design criterion for CCS and SWS performance was that the

maximum CCS supply temperature should not exceed 95°F for normal plant power operation with a single train of cooling water systems in service and ambient wet bulb temperature at the maximum safety wet bulb (noncoincident) air temperature value. Increases in the value of the standard site maximum safety wet bulb (noncoincident) air temperature from 81°F to 85.5°F and finally (in DCD Revision 17) to 86.1°F have been made to include a larger number of candidate sites within the standard site temperature envelope for AP1000 and are reflected in the current revision of the DCD (Revision 19). The most limiting component cooled by the CCS, the RCP motor cooling system, has been designed to operate for at least 6 hours continuously with cooling water supplied at temperatures up to 100°F, as a result of the increases in CCS temperature above 95°F associated with the previous increases in limiting wet bulb temperature. Each RCP is provided with four safety-related temperature sensors to monitor the stator cooling water temperature. These sensors generate a high temperature alarm when stator cooling water temperature rises above the normally expected operating range, and produce a reactor trip and RCP trip to protect the pumps if stator water temperature continues to rise beyond the trip setpoint. Operators monitor the cooling water temperature to verify that the RCPs are operating within normal temperature bounds at high ambient wet bulb air temperature conditions.

Calculation note TPG-CCS-M3C-001, Revision 0, *Turkey Point Units 6 and 7 Performance Evaluation using Elevated Maximum Non-Coincident Safety Wet Bulb Temperature* documents the performance of the standard AP1000 CCS and SWS for single cooling water train, full power operation at the higher maximum safety wet bulb (noncoincident) air temperature of 87.4°F. The highest CCS temperature achieved at these conditions is 97.4°F consistent with the maximum duration of the highest site ambient wet bulb temperature. The SWS cooling water supply temperature assumed for this evaluation was determined in calculation note TPG-SWS-M3C-001, Revision 0, *Turkey Point Units 6 and 7 Cooling Tower Performance Evaluation Using Elevated Maximum Normal and Maximum Safety Wet Bulb Temperatures*. At the highest assumed value of wet bulb temperature (87.4°F) the predicted value of SWS cold water temperature with the plant operating at full power is 91.84°F, which is lower than the DCD required upper limit of 93.5°F for this value.

As ambient wet bulb temperature decreases, the SWS and CCS temperatures follow CCS supply temperature will fall below 95°F with ambient wet bulb temperatures slightly lower than 84°F, assuming nominal performance of both the CCS and SWS. Since the definition of the maximum normal wet bulb (noncoincident) air temperature value is the seasonal 1% exceedence wet bulb temperature value observed at the site, the annual total operating time for which CCS temperatures could exceed 95°F is less than 30 hours per year, for periods of a few hours at most. The maximum CCS temperature of 97.4°F expected for Turkey Point Units 6 & 7 is well below the maximum allowable cooling water temperature of 100°F for Reactor Coolant Pumps (the most limiting component) and the increase in maximum safety wet bulb (noncoincident) air temperature for Turkey Point Units 6 & 7 is therefore acceptable on this basis.

No changes to the design of the CCS or SWS are required for Turkey Point Units 6 & 7 to meet the DCD requirement that CCS temperature remains below 100°F for normal power operation.

Spent Fuel Cooling System Design and Performance Fuel Shuffle Refueling with Return to Power (FSAR Section 9.1.3.1.3.1)

Only one of the the spent fuel pool cooling performance requirements described in the AP1000 DCD uses the maximum safety wet bulb (noncoincident) air temperature as its basis for determining SFS performance. This case determines the limiting spent fuel pool temperature immediately following plant restart after a normal (fuel shuffle) refueling.

Calculation note APP-SFS-M3C-042, Revision 0, *SFS HX Sizing Calculation Using Florida Power and Light (Turkey Point) Increased Wet Bulb Temperatures* documents the performance of the Turkey Point SFS in removal of spent fuel decay heat for the fuel shuffle refueling case. The calculation confirms that spent fuel pool temperature will be slightly higher than 114°F assuming a CCS supply temperature of 97.0°F to the SFS heat exchangers, with the spent fuel loading condition and decay time on the fuel fraction just replaced during the previous 17 day refueling outage as specified in the DCD. Operation of both SFS pumps and heat exchangers for approximately one month after refueling is required, in order to maintain SFS pool temperature below 120°F. After the freshly discharged core region has cooled for about one month only one train of SFS is needed to maintain the pool temperature below 120°F.

CCS supply temperature of 97.4°F is predicted for power operation at the Turkey Point maximum wet bulb temperature of 87.4°F. The 0.4°F increase in CCS temperature supplied to the SFS heat exchangers results in a predicted increase in SFS pool water temperature of approximately the same amount. Therefore, SFS pool water temperature remains below 115°F for Turkey Point Units 6 & 7 with ambient wet bulb air temperature at its maximum safety (noncoincident) value.

No design changes to the Turkey Point Units 6 & 7 SFS, CCS, or SWS are required to accommodate the increased maximum safety wet bulb (noncoincident) air temperature value.

Turbine Building Closed Cooling Water System (TCS) Design and Performance (FSAR Section 9.2.8.1.2)

The Turkey Point Units 6 & 7 Circulating Water System (CWS) is a site specific design, and is not part of the standard AP1000 design. However the CWS does interface with the condenser as well as with the TCS heat exchangers and condenser vacuum pump seal water (CMS) heat exchangers, and these are part of the AP1000 standard design. The CWS is designed to supply cooling water to the main condenser and the TCS and CMS at a nominal temperature of 91^{o}F at full power conditions, using mechanical draft cooling towers.

Cooling tower cold water temperature variations with ambient wet bulb temperature at full power design conditions are described in calculation note TPG-TCS-M3C-001, Revision A, *TCS Supply Temperature at 87.4 ^{o}F Ambient Wet Bulb*. The referenced Turkey Point TCS performance calculation indicates that the maximum TCS temperature supplied to the plant turbine and generator auxiliaries will be significantly lower than the maximum TCS supply temperature design limit of 105 ^{o}F for the system.

No changes to the design of the Turkey Point Units 6 & 7 TCS or CWS are required to accommodate the increase in maximum safety wet bulb (noncoincident) air temperature for the site.

In-Containment Refueling Water Storage Tank (IRWST) Temperature Control (FSAR Section 5.4.7.1.2.3)

The RNS heat exchangers are used to control the temperature of the water in the IRWST during normal operation, and to remove heat during Passive Residual Heat Removal System (PRHR) operation to prevent the IRWST from steaming to containment. The steaming prevention function is evaluated assuming the ambient wet bulb temperature is at the maximum safety (noncoincident) value defined for the site. Therefore, an increase in the value of this parameter has the potential to affect the performance of the IRWST steaming prevention function provided by the integrated IRWST heat removal system provided by operation of the RNS, CCS, and SWS.

During plant operation, maximum IRWST temperature is reduced below 120 ^{o}F whenever necessary by circulating IRWST water through one of the RNS heat exchangers, and removing the heat through the CCS and SWS. Since the RNS heat exchangers are not being used to remove decay heat with the plant at power, at least one is available for IRWST heat removal. Only one train of CCS (pump and heat exchanger) and one train of SWS (pump, strainer, and cooling tower cell) are normally in operation with the plant at power. There is sufficient margin in CCS pump flow capacity and motor size, and in CCS heat exchanger sizing, to valve in the shell side of one of the RNS heat exchangers and remove IRWST heat by directing CCS flow through the heat exchanger and transferring

the excess heat to the SWS cooling tower. CCS temperature rises slightly above the normal full power CCS temperature during this evolution but does not approach the maximum allowable value of 100 ^{o}F.

Prevention of IRWST steaming following high pressure heat removal operations with the Passive Residual Heat Removal (PRHR) heat exchanger is accomplished in the same manner, by lining up both RNS heat exchangers to the CCS and the IRWST. CCS is delivered to the RNS heat exchangers at a temperature consistent with the maximum safety ambient wet bulb temperature and the CCS and SWS heat duty and flow rates. Cooling is assumed to begin two hours after reactor trip, with decay heat appropriate for that time after the event. Calculation note APP-PXS-M3C-060, Revision 0, *IRWST Heatup with FPL Wet Bulb Temperature* was performed to determine the maximum IRWST temperature achieved following a high pressure heat removal event using the PRHR heat exchanger. This calculation note assumes CCS temperature is determined by assuming that ambient wet bulb temperature remains constant at the maximum safety (noncoincident) value (87.4^{o}F) for the Turkey Point site.

The maximum predicted IRWST liquid temperature with these conditions is 201^{o}F for Turkey Point. Therefore, IRWST cooling performance (prevention of steaming) as required by the AP1000 DCD is also achievable for Turkey Point Units 6 & 7 and no changes to the plant design are required as a result of the increased maximum safety wet bulb (noncoincident) air temperature value for the site.

Nuclear Island Non-Radioactive Ventilation System (VBS) Design and Performance

The Nuclear Island Non-radioactive Ventilation System (VBS) is the only HVAC system that is designed to accommodate the maximum safety wet bulb (noncoincident) air temperature. The Low Capacity Chilled Water subsystem (LCCWS) also uses the maximum safety (noncoincident) air temperatures (dry and wet bulb) as its design basis temperatures. The remainder of the HVAC systems are designed to accommodate the maximum normal air temperatures (1% exceedance values). These maximum normal wet and dry bulb air temperature limits apply for evaluation of the High Capacity Chilled Water subsystem (HCCWS) performance.

The VBS maintains the safety related heat sink temperatures and is designed with two 100% capacity subsystems. The VBS is served by the Low Capacity Chilled Water System (LCCWS) exclusively. The LCCWS also serves the RNS and CVS pump room coolers. The nominal refrigeration capacity of each of the air-cooled chillers used in the LCCWS is 300 tons at an ambient dry bulb temperature of 115^{o}F.

Calculation note APP-GW-M1C-002 Revision A, *AP1000 High Humidity HVAC Systems Design Evaluation* assesses the impact of increases in both maximum safety and maximum normal ambient wet bulb (noncoincident) air temperatures on the design and

performance of the HCCWS and LCCWS. It assumes that the maximum safety ambient wet bulb (noncoincident) air temperature increases to 87.4°F and the maximum normal ambient wet bulb (noncoincident) air temperature increases to 81.5°F.

The increased heat load produced by operation at the higher Turkey Point Units 6 & 7 maxium safety ambient wet bulb (noncoincident) air temperature of 87.4°F can be accommodated within the available capacity margin of the LCCWS chiller units, without impacting the LCCWS or supporting systems designs or plant operation. Since the LCCWS chillers are air-cooled, their performance is not affected by changes in wet bulb temperature. Cooling coil design calculations indicate that during operation at the standard plant design temperature limits (115°F dry bulb, 86.1°F wet bulb), the VBS air handling unit has cooling coil and system margin.

At the Turkey Point Units 6 & 7 site design temperature limits of 103°F dry bulb and 87.4°F wet bulb, the off coil temperatures for VBS do not change, based on the results of supplier coil performance calculations. Therefore, the MCR temperature and humidity at the higher Turkey Point Units 6 & 7 site outside air wet bulb temperature will remain at or below their desired design points during normal operation.

No changes are needed in the AP1000 LCCWS design. Therefore, the existing, standard air-cooled chillers and the associated VBS both perform acceptably at the increased Turkey Point Units 6 & 7 site maximum safety wet bulb (noncoincident) air temperature of 87.4°F.

Passive Heat Sinks for Main Control Room Habitability System

The passive heat sinks associated with the Main Control Room Habitability System (VES) control the auxiliary building safety related room temperatures post-accident. The temperature profiles of these rooms are affected only by ambient dry bulb temperature. The Turkey Point Units 6 & 7 maximum ambient dry bulb temperature (103°F) is enveloped by the current AP1000 standard site value of 115°F. The passive heat sink analysis of record for AP1000 therefore remains valid for Turkey Point Units 6 & 7 as well.

In the emergency mode of operation, the control room and associated control area spaces are isolated from the normal ventilation systems. Discharge of dry air from the VES emergency air storage tanks controls the humidity levels in the MCR and associated control spaces for at least 72 hours following an accident. In this mode of operation, the VES is designed to control the air quality in the MCR and control spaces to within the requirements of ASHRAE Standard 62 – 1989, *Ventilation for Acceptable Indoor Air Quality*.

No design changes are needed to ensure that the performance of the VES is maintained with the increased maximum safety (noncoincident) wet bulb temperature at the Turkey Point site.

RTNSS Availability and Heat Removal Capability of SWS and CCS

The RTNSS function of the CCS and SWS is to remove decay heat during Mode 5 and Mode 6 reduced RCS inventory operations. Heat removal performance is reduced by increases in ambient wet bulb temperature that cause increases in SWS cold water temperature and CCS supply temperature. However, the total heat duty of the CCS and SWS is significantly lower during this mode of operation, as compared to operation in the normal power or cool down modes, because there is essentially no sensible heat to remove from the RCS and the core decay heat level is low. Primary plant component heat loads are also very small because no RCPs are in operation. Any slight increase in ambient wet bulb temperature will not compromise the heat removal capability of the CCS and SWS.

The impact of an increase in the Turkey Point Units 6 & 7 maximum safety wet bulb (noncoincident) air temperature from 86.1^{o}F to 87.4^{o}F on the RTNSS performance of the CCS and SWS is therefore acceptable.

No changes are needed to the SWS or CCS Investment Protection Short Term Availability Control (IPSAC) requirements for Turkey Point Units 6 & 7 as a result of the increased value of maximum safety wet bulb (noncoincident) air temperature.

CONCLUSION:

PTN RAI 09.02.02-1 states*: "Justify departure PTN DEP 2.0-3 in a manner that encompasses the components/systems considered in the VC Summer response to RAI 09.02.02-1 in its June 30, 2010 Letter to NRC NND-10-0254 (ML101830391) and the above AP1000 justification and evaluation, or explain why justification with respect to those components/systems is not necessary."*

Each of the areas discussed in departure PTN DEP 2.0-3 has been reviewed in detail and the results of the evaluations described above.

These evaluations demonstrate that there is sufficient margin to accommodate the increase in maximum safety wet bulb (noncoincident) air temperature from 86.1^{o}F to 87.4^{o}F, without requiring changes to the certified AP1000 design for Turkey Point Units 6 & 7.

There are also two additional requests included as part of RAI 09.02.02-1. These pertain to confirming that the RNS can reduce RCS temperature from 350°F to 125°F within 96 hours after reactor shutdown with ambient wet bulb air temperature at 87.4°F, and that the RNS can maintain the temperature of the IRWST below boiling following Passive Residual Heat Removal heat exchanger actuation, and IRWST temperature below 120°F during normal operation at the same ambient air temperature.

Evaluation of the performance of the RNS in limiting IRWST temperatures uses the maximum safety wet bulb (noncoincident) air temperature as a basis, and is described above. Cool down of the plant is evaluated assuming that the ambient wet bulb temperature is constant at the site maximum normal wet bulb (non-coincident) air temperature of 81.5°F, and is discussed in the response to RAI 09.02.02-2.

This response is PLANT SPECIFIC.

References:

ASHRAE Standard 62 – 1989, *Ventilation for Acceptable Indoor Air Quality*.

ASSOCIATED COLA REVISIONS:

No COLA changes have been identified as a result of this response.

ASSOCIATED ENCLOSURES:

None