Progress Energy

RESPONSE TO COMMENTS ON CRYSTAL RIVER UNIT 3 UPRATE PROJECT SITE CERTIFICATION APPLICATION

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ON
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1.0 FDEP SOUTHWEST DISTRICT OFFICE

1. **It appears that the construction laydown and parking areas will impact the following wetland systems: Freshwater Marsh, Florida Land Use, Cover, and Forms Classification System (FLUCFCS 641) and Mixed Wetland Hardwoods (FLUCFCS 617). Also, it appears that the new cooling towers will impact a Saltwater Marsh (FLUCFCS 642). We would recommend having the applicant clearly identify the limits of all wetlands on an aerial photograph. Uniform Mitigation Assessment Method (UMAM) sheets will also need to be included in the application to assess any wetland impacts associated with the project.**

   We also require signed and sealed drawings to be submitted for our projects per Chapter 62-343.070, F.A.C.

   Response: Progress Energy acknowledges the comments of the Environmental Resource Permit Section of the FDEP Southwest District. Conceptual design information for laydown and parking areas that was submitted as part of the Site Certification Application (SCA) was submitted for information purposes only. These areas are to be constructed to support the Steam Generator Replacement Project at CR3 which is an activity that in itself does not trigger the need for Site Certification and will need to be authorized and constructed prior to and separately from the receipt of a Site Certification. The Steam Generator Replacement Project will be undertaken regardless of issuance of a favorable final site certification under the PPSA for the CR3 Uprate Project. It is Progress Energy's intent to file for an Environmental Resource Permit (ERP) for activities requiring an ERP permit and which is related to the Steam Generator Replacement Project as soon as the detailed design work for those impacts has been completed. All information needed to support the issuance of an ERP for the Steam Generator Replacement Project will be supplied with the ERP application. This information will include, but is not limited to wetland delineations, UMAM assessments, storm water runoff calculations and treatment design and any necessary mitigation proposal as necessary. Prior to any construction, Progress Energy will prepare a Storm Water Pollution Prevention Plan and submit the Notice of Intent to use the FDEP Generic Permit for Storm Water Discharge for Large and Small Construction Activities.

   It is expected that the CR3 Uprate Project will not have any ERP-related impacts, except for the potential onsite cooling tower which may impact onsite wetlands. The exact location and design of that cooling tower is not yet known, and will be addressed in the separate NPDES permit renewal application. The design and function of the cooling tower will be based on the water quality considerations to be addressed in that permit renewal. Progress Energy proposes that appropriate conditions of certification to provide for post-certification review of ERP impacts, including impacts to wetlands, be developed for the CR3 Uprate Project.

2. **Please submit aerial surveys that include:**
   - **The limits of any wetlands located within the proposed project area,**
   - **The location of any listed species from the Florida Natural Areas Inventory or observed during site visits.**

   Refer to Chapter 62-343.900(1), Section E, F.A.C.

Response. See Response to Item 1 above. Section 2.3.6 of the SCA provides a description of flora and fauna, including listed species, at the project area and near CR3.

3. **Figure 4.1.1-1 shows the location of the proposed laydown and parking areas and the new cooling towers being constructed over an existing wetland. Attempts to minimize or avoid impacts to wetlands will be required. If dredging and filling of wetlands is unavoidable mitigation may be required. Therefore, a UMAM form must be completed and mitigation must be proposed by the applicant that will offset wetland impacts within all areas of the proposed right of way. Refer to Chapter 3.2.1.1 of the SWFMD Basis of Review, and Chapter 62.345 F.A.C.**

   Response. See Response to Item 1 above.

4. **Pursuant to Chapter 3.2.4.1 of the Basis of Review, the applicant must address the short term water quality impacts of a proposed system by (1) providing turbidity barriers or similar devices for the duration of construction activities in or adjacent to wetlands or other surface waters, and (2) stabilizing newly created slopes or surfaces in or adjacent to wetlands and other surface waters to prevent erosion and turbidity. Please show the location of erosion control barriers on the plan view drawings and describe the specific soil stabilization methods to be used at each site. Erosion control and soil stabilization methods should be included on the plan and cross sectional view drawings.**

   Response: See Response to Item 1 above. Additionally, Progress Energy will obtain coverage for stormwater discharges from construction activities associated with the Uprate Project under the State of Florida Generic Permit for Stormwater Discharge from Large and Small Construction Activities. Also in accordance with Part V of the Generic Permit, Progress Energy will prepare a Stormwater Pollution Prevention Plan (SWPPP) and file a Notice of intent (NOI) to be covered under the generic permit. The location of erosion control barriers will be shown on the plan view drawings and describe the specific soil stabilization methods to be used at each site. Erosion control and soil stabilization methods will be included on the plan and cross sectional view drawings.

5. **Page 2-28 of Volume 1 references "additional construction laydown and parking". This referenced area seems to be a wetland. There were no calculations provided which detail the resultant increase in runoff, and there is no discussion of providing treatment for this runoff.**

   Reference: 40D-4.301, F.A.C., and the Southwest Florida Water Management District Environmental Resource Permit Information Manual, Management and Storage of Surface Waters, Part B, Basis of Review (BOR):

   Response. See Response to Item 1 above.

Industrial Wastewater Comments

6. **Under Section 3.0, The Plant and Directly Associated Facilities, Item 3.5, the applicant indicates that a conservative and conceptual design plan for the South Cooling Tower has been proposed. The applicant also states that a detailed design will be addressed as a part of the NPDES renewal process in 2009. It is recommended that the applicant submit the conservative and conceptual design to Tallahassee's Industrial Wastewater**

Power Plant Section to initiate a preliminary review of this design. Please have the applicant submit the conceptual design of the South Cooling Tower to the Department for review.

Response: The conceptual design of the new South Cooling Tower (SCT) was briefly described at the top of page 3-11 within section 3.5 of the Site Certification Application (SCA), and its proposed location and layout were shown in SCA Figures 3.4.1-1 and 3.5.1-1. The physical, performance, and annual emissions data for the SCT were tabulated in SCA Table 3.4.1-2, and in Table 2-2 in Section 5.0 of Appendix 10.1.5 of the SCA (PSD Application). A detailed design of the SCT will be submitted to the Agency for preliminary review when available. A final design will be included with the regular NPDES permit renewal submittal.

The thermal performance of the SCT was set equal to that of the existing Helper Cooling Towers and is summarized below:

Permanent Helper Cooling Towers Design Conditions	
Wet Bulb	81 Degrees F
Hot Water Temperature	103 Degrees F
Cold Water Temperature	89.5 degrees F
Flow	684,600 gpm
Heat Dissipated	4.5689 Billion Btu per hour

Waste Program Comments

7. Executive Summary. Please include a summary of potential impacts (or lack thereof) to current waste management practices at the facility in this section.

Response. There will be no new impacts to current waste management practices as the result of this project.

8. Section 2.0.

a. §2.1.2. indicates that intake screenings are "collected in a sump prior to discharge to the intake canal (page 2-2)". Please clarify what types of materials are discharged (disposed of) in the intake canal.

Response. The traveling screens are equipped with a backwash system which washes the debris and impinged organisms off the screens into a common trough. The intake screen wash trough slopes to the west where solid material or waste is collected in a screened basket. The collected solid material is placed into the trash for appropriate disposal of in the County landfill. The trough receives combined wash water from all screens and the water is returned to the intake canal via a sump pump per the NPDES permit. Only screen wash water which is ambient seawater pumped from the intake canal is discharged to the intake canal.

b. §2.3.4.4. Please clarify where sludge from the onsite domestic waste treatment and water treatment plants is disposed.

Response. The waste sludge from the domestic wastewater treatment plant is collected by American Pipe and Tank and transported to their facility. This company processes and treats this sludge that is transported from the Progress Energy on-site, permitted domestic/sanitary waste treatment facility. The waste sludge from the water treatment plant is collected and disposed of on-site within the ash landfill.

Both the domestic waste treatment plant and the water treatment plant are common facilities that are authorized under existing permits to serve Units 1, 2, and 3. The permits will remain in effect.

c. Figure 2.3.4-4. Please clarify where the solid materials from the screen wash (intake and discharge canals) is discharged/disposed.

Response. In reference to question 8 c, Figure 2.3.4-4 identifies screen washes. Solid materials from these washes are removed from the water and disposed in the trash for disposal within F.A.C requirements. Following screening, water is discharged back to the intake or discharge canal per NPDES permit requirements.

9. Section 4.0.

a. §4.1.1. Please be advised that debris and other materials generated from the project that may be contaminated shall not be disposed of at unlined landfills (i.e., C&D debris disposal facilities). Materials that may be radioactive shall be managed in accordance with Chapter 404, Florida Statutes and NRC regulations. This comment is for information only and does not require a response.

Response. Comment acknowledged. No response required. Progress Energy will be in full compliance with these requirements.

10. Section 5.0.

a. §5.1.2. Please specify where "impingement mortality" organisms are disposed. In the event that the quantity of these organisms increases significantly, additional solid waste management measures may be required.

Response. Impingement mortality organisms are collected and placed into the trash for appropriate disposal in the County landfill. Comment acknowledged.

11. Progress Energy has stated that the amount of water proposed to be with drawn from Crystal Bay will be the same volume as currently utilized by the existing infrastructure. They have made assertion that there will be no increase of water withdraw from Crystal Bay estuary due to facility upgrades and use of new improved technologies. Please provide supporting information to substantiate this claim.

Response: Progress Energy has performed a preliminary analysis of the expected operating results from the proposed south Cooling Tower (SCT) described in Response FDEPSW-6 above.

Figure FDEPSW-11-1 (attached) shows the flow diagrams for the pre-uprate and post-uprate

cases. The existing NPDES permit limits the flow through the three units (1, 2, and 3) to 1,318,000 gpm (1,897.9 MGD) during the months May through October, and 1,132,792 gpm (1,613.2 MGD) during the months November through April. These are shown in the top diagram of Figure FDEPSW-11-1 labeled "Pre-Uprate". The existing flow from Crystal Bay to the plant is shown under the words "Intake Canal" as 1,318,000 gpm during May through October and 1,132,792 (in red) during November through April. The diagram assumes that the existing Helper Cooling Towers (HCT) are operating; however, the flow from Crystal Bay is the same whether the HCT operate or not.

The lower diagram in Figure FDEPSW-11-1 shows the estimated plant flow rates after the uprate is complete and the SCT is operational. This diagram assumes the largest potential increase in the circulating water flow rate of 150,000 gpm resulting in flow through the three units of 1,468,000 gpm during the months of May through October, and 1,270,292 gpm during the months of November through April. The conceptual design of the SCT requires that the southernmost 8 cells operate year-round in the recirculating mode, whenever all three units are operating, in order to avoid any increase in discharge temperature or heat rejected to Crystal Bay, and to avoid any increase in flow withdrawn from Crystal Bay. In the Post-Uprate diagram shown in Figure FDEPSW-11-1, it has been assumed that the remaining 10 cells will be operating in the helper cooling tower mode in order to continue to meet the NPDES limits on rolling average discharge canal exit temperature. The 152,136 gpm that is recirculated from the new SCT l will be discharged to the intake canal via a diffuser to ensure that it is well-mixed with the incoming flow from Crystal Bay. As shown on the diagram, this recirculation of 152,136 gpm will reduce the amount of water withdrawn from Crystal Bay to 1,315,864 gpm during May through October, and to 1,118,156 gpm during November through April. Both of these withdrawals are reduced from the pre-uprate case and comply with the existing permit limits.

12. The applicant has stated that there will be no net increase in thermal effluent into the Crystal Bay estuary. Please provide supporting information to substantiate this claim.

Response: In order to demonstrate PEF's objective that there is no net increase in thermal effluent to Crystal Bay as a result of the Uprate Project, it is necessary to demonstrate two conditions:

1. There will be no increase in heat (measured in Btu per hour) in the discharge to Crystal Bay, and
2. There will be no increase in the temperature of the discharge to Crystal Bay.

In order to demonstrate these two conditions, it is also necessary to demonstrate that the recirculated water from the SCT will not cause an increase in the temperature of the intake water to units 1, 2, and 3 (Units). Progress Energy has performed a detailed but preliminary analysis of the expected thermal operating characteristics of the circulating water system of Units 1,2 and 3 (Units) after the uprate is accomplished. The preliminary analysis has been performed on a monthly basis for two cases, based on available Discharge Monitoring Reports (DMR) data (January 2003 through February 2007). The two cases are:

1. Average ambient temperature in Crystal Bay, and
2. Maximum ambient temperature in Crystal Bay.

Table 1 shows the existing average monthly intake temperatures and the combined Units 1, 2 and 3 discharge temperatures assuming full load on all three units (worst case). Table 1 also

shows the future SCT cold water temperature which will be recirculated to the intake canal, and the resulting blended temperature of the SCT's recirculating cells combined with the intake water. It shows that in no case does the SCT cooling tower discharge to the intake canal cause the three Units' intake temperature to increase by as much as one degree F. In fact, during summer months of July and August, the cooling tower cold water is predicted to actually reduce the Units' intake temperature slightly. Figure 1 displays the results of Table 1 graphically.

Table 2 is similar to Table 1, except that the starting intake temperatures are the recorded maximum monthly values rather than the average temperature. The results are similar in that the blended intake temperature is predicted to not exceed the ambient temperature by more than 1 degree F, except for the winter months December through February during which the maximum increase is 1.2 degrees F. Figure 2 is a graphical presentation of the information in Table 2.

Tables 1 and 2, and Figures 1 and 2, demonstrate that the recirculated water from the SCT will not cause a significant increase in the intake temperature to the units thereby helping to avoid any increase in the thermal discharge, as discussed below.

Table 3 shows the existing average monthly discharge temperatures before and after the effects of operation of the existing Helper Cooling Towers (HCT), and the predicted discharge canal exit temperatures after the CR3 Uprate Project, assuming the HCT are utilized whenever the Units' discharge temperature exceeds 96.5 degrees F. Table 3 assumes whenever the HCT are needed, all of them are operated. In actuality, not all of them would always be needed; however, whenever Table 3 predicts that the discharge canal exit temperature is less than 96.5 degrees F it simply means that not all of the HCT need to be operated. Table 3 also predicts the Units' average monthly discharge temperatures after the uprate project and the predicted discharge canal exit temperatures, assuming the HCT are utilized during the same months they were utilized for the existing case. In every case, the discharge canal exit temperature is predicted to be less for the Units after the uprate project than for the existing condition. The reduction in discharge canal exit temperature in every month is more than the increase in predicted blended intake canal temperature shown in Table 1. Thus, under monthly average conditions, the discharge canal exit temperature is predicted to always be less after the uprate than before. Figure 3 presents the results from Table 3 graphically.

Table 4 is similar to Table 3, except that starting intake temperatures are the maximum monthly values rather than the average. The results are similar in that the discharge canal exit temperature is predicted to be less for the units after the uprate than for the existing condition. The reduction in discharge canal exit temperature in every month is less than the increase in predicted blended intake canal temperature shown in Table 2 except for November in which they are the same. Thus, under monthly maximum conditions, the discharge canal exit temperature is predicted to always be no more after the uprate than before. Figure 4 presents the results from Table 4 graphically.

Tables 1 through 4, and Figures 1 through 4, demonstrate that the uprate of CR3 as proposed by Progress Energy will not cause the discharge canal exit temperature to increase over that of the existing Units.

Table 5 contains the estimated heat load to Crystal Bay from the existing units, and the units after the uprate, during average monthly conditions. The heat load is a function of the product of the temperature difference between the entrance to the intake canal and the exit from the discharge canal, and the discharge canal exit flow rate. In each case, the heat load after the uprate is estimated to be less than that before the uprate. Figure 5 portrays the results from Table 5 graphically.

Table 6 contains the estimated heat load to Crystal Bay from the existing Units, and the Units after the uprate, during maximum monthly conditions. The heat load is a function of the product of the temperature difference between the entrance to the intake canal and the exit from the discharge canal, and the discharge canal exit flow rate. In each case, the heat load after the uprate is estimated to be less than that before the uprate. Figure 6 portrays the results from Table 6 graphically. Please note that these estimates are preliminary, however, the goal of the SCT portion of the project is to maintain the current heat load limitation to Crystal Bay. Final detailed analyses will be submitted as part of the forthcoming NPDES permit renewal for the CR site.

Tables 5 and 6, and Figures 5 and 6, demonstrate that the uprate of CR3 as proposed by Progress Energy will not cause the heat load to Crystal Bay to increase over that of the existing Units.

13. Please provide thermal dissipation modeling for the existing and proposed heat dissipation systems. Please provide current benthic habitat surveys for the areas that have the potential to be affected by an increase of thermal effluent.

Response: Thermal modeling of the existing Crystal River Units 1, 2, and 3 was performed in the 1980s and is documented within the report "*Crystal River Units 1, 2, and 3, 316 Demonstration", Final Report, Crystal River 316(b) Studies*, January 15, 1985. This report was provided to EPA and FDEP in response to requirements of Part III-H of NPDES Permit FL0000159 for Crystal River Units 1, 2, and 3, dated July 9, 1979. Because of the size of the document, a copy is being sent under separate cover to the commenter. As demonstrated in Response FDEPSW-12 above, the thermal discharge after the uprate will be substantially the same as the existing discharge, although slightly reduced in heat load and discharge temperature. Therefore, as discussed in Section 5.1.1 of the SCA, the modeling presented in the document referenced above can be considered slightly conservative but applicable when applied to the thermal discharge after the uprate. Please note that these estimates are preliminary, however, the goal of the SCT portion of the project is to maintain the current heat load limitation to Crystal Bay. Final detailed analyses will be submitted as part of the forthcoming NPDES permit renewal for the CR site.

As discussed above, there are no areas that have the potential to be affected by an increase of thermal effluent. Therefore, no current benthic habitat surveys are warranted or provided in response to the comments.

14. According to the application, the increase in velocity could result in an increase in impingement mortality. Does the applicant intend to mitigate for the increased impingement mortality?

Response: As described in SCA Section 5.1.2, Progress Energy proposes to continue to evaluate the entrainment and impingement impacts associated with the Crystal River Energy Complex (CREC) ongoing facility operations as well as the impacts associated with the CR3 Uprate Project, and will mitigate for the increased impingement mortality if any occurs through the NPDES renewal process. While mitigation is still being considered by regulatory agencies, Progress Energy will continue its current onsite fisheries mitigation program to compensate for impingement.

15. **Please provide reasonable assurance the CR3 Uprate Project will not have adverse negative impacts to fisheries and aquatic resources of the St Martins Marsh and Big Bend Seagrasses Aquatic Preserves**.

Response: See the responses to FDEPSW-11, FDEPSW-12, FDEPSW-13, and FDEPSW-14 above.

16. Progress Energy is currently proposing construction of a new nuclear facility in Levy County. This may result in additional thermal effluent discharges within the Crystal Bay and Withlacoochee estuaries- The applicant should consider cumulative impacts to the Crystal Bay and Withlacoochee estuaries.

Response: Progress Energy cannot address the impacts associated with the proposed Levy Nuclear Plant since its final design and discharge system are not yet known. Just as the CR3 Uprate Project has had to address cumulative impacts of the existing station and the Uprate Project, the Levy County facility may have to address cumulative impacts between itself and Crystal River Energy Center when that project files an SCA, based on predicted impacts of that project. Further, since the CR3 Uprate Project will not cause any increase in thermal effluent discharges, as demonstrated in the responses above, cumulative impacts with other projects are not warranted.

Industrial Waste Water Section (TLH)

1. Figure 3.5.1-1 of the application indicates that the once through cooling water discharge from Crystal River Units 1, 2 and 3 has a flow rate of 1,304,271 gpm (or 1878 MGD). However, the facility has a flow limitation of 1,613.2 MGD during November through April. Please explain.

Response: Comment acknowledged. Figure 3.5.1-1 depicts the water use diagram during the months May through October and is comparable to SCA Figure 2.3.4-4 for the existing facility. Please see the response to A-FDEPSW-11 and the associated Figures 7 and 8 for the updated water use diagrams for both the existing and proposed facilities.

2. On page 3-9, the application indicates an increase in the thermal loading due to uprate of Crystal River Unit 3 as 0.768 billion BTUs/hr and the existing helper cooling towers and new six-cell cooling tower in the helper mode would then reduce the combined discharge temperature rise down to 6.46 °F. The NPDES permit has a 3 hr rolling average of 96.5 °F. Progress Energy needs to provide the necessary calculations.

Response: Please see the response to A. FDEPSW- Item 12.

3. **On page 3-11 of the application an increase in the through screen-velocity from 1.45 to 2.02 fps is indicated due to the CR3 uprate project. The increased velocity could result in increased impingement mortality. Progress Energy needs to provide necessary impingement and entrainment studies in accordance with Section 316(b) of the Clean Water Act.**

   Response: The necessary impingement and entrainment studies under Section 316(b) are ongoing and will be submitted to the FDEP in accordance with the forthcoming renewal of the site's NPDES permit.

DEP Watershed Assessment Section (TLH)

1. **A review of the cooling tower design by the Department during the permit renewal process will be needed to ensure that there will be no increase in heat load or temperature rise leaving the discharge canal at the point of discharge.**

   Response: Comment noted. Progress Energy proposes to follow this approach to address thermal issues. Please see response to A. FDEP-SW-6 for more details on the cooling tower design and FDEPSW-12 for a preliminary analysis of pre- vs. post-uprate discharge temperatures and heat loads.

DEP Bureau of Laboratories Biology Section (TLH)

Progress Energy proposes to continue to evaluate the entrainment and impingement impacts associated with Crystal River Energy Center ongoing facility operations as well as the impacts associated with the CR3 Uprate Project. Progress Energy intends to quantify aquatic impacts to offset impacts during the CREC NPDES renewal process (scheduled for submittal in 2009). The additional entrainment and impingement impacts may be avoidable if they are adequately addressed in the 2009 NPDES permit cycle in response to the 316b rule. Increased intake velocities will increase impingement, so, this effect should be addressed in future permits (as stated). It is unclear why the velocity entering the canal is more important to consider, as organisms are not prevented from traveling up the canal to the intake screen. Please explain.

Response: Many investigators have made the case that flow is as important or more important than through-screen velocity. Reed Super of Riverkeeper Inc. made the case at the EPA 316(b) Symposium in 2003 that the level of impingement is proportional to the flow to the 3/2 power (approximately) (See Appendix A for copy of presentation). By recirculating a portion of the SCT flow to the intake canal, the flows before and after the uprate project is complete are presented in Response FDEPSW-11; for all practical purposes, the flow rates into the intake canal are the same pre-uprate as they will be post-uprate. Based on this analysis, the uprate should not cause any increase in impingement impacts.

Analysis of the expected average velocities in the intake canal indicates that the following range can be expected:

	High Tide (MHW)		Low Tide (MLW)	
	Pre-uprate	Post-uprate	Pre-uprate	Post-uprate
Velocity May through October (feet per second)	1.049	1.047	1.263	1.261
Velocity November through April (feet per second)	0.891	0.890	1.074	1.072

The now-vacated 316(b) Phase II rule addressed the impacts of impingement mortality and entrainment, but did not address the impact of what the State of Maryland in their 316(b) program calls entrapment. They define entrapment as the effect that occurs when swimming organisms are drawn into a body of water such as an intake canal and are trapped there because they are unable to swim back out; they cannot overcome the velocity towards the plant in that intake canal. Eventually they tire and are drawn to the screen structures and are impinged. EPA has concluded that a threshold velocity against which most fish cannot be expected to swim upstream is on the order of one foot per second; they further stated that a good safety factor would be 100%. That is why they set BAT for intake velocity as 0.5 feet per second through the screens. Bearing this information in mind, two factors become obvious when viewing the table above:

1. All of the velocities in the table are on the order of one foot per second which are threshold velocities cited by EPA.
2. There is no significant statistical difference between the existing velocities and the predicted velocities after the uprate.

Based on this analysis, Progress Energy expects that the implementation of the uprate project will not cause any measurable increase in impingement mortality since there is no increase in the velocity in the intake canal.

Siting Office

1. **Please provide the applicable federal regulation (rule) citations for the ongoing and anticipated projects mentioned in the application (and any other projects not mentioned) that exclusively fall within the jurisdiction of the Nuclear Regulatory Commission (NRC). These projects include, but may not be limited to, Measurement Uncertainty Recapture, License Renewal, and increase in power output.**

   There are no separate "applicable federal regulations (rules)" associated with power level uprates and other expected projects at CR3. The entire set of applicable federal regulations, principally the NRC, must continue to be met by CR3 at any power level.

   The process for amending commercial nuclear power plant licenses and technical specifications related to power uprates is the same as the process used for other NRC-issued license amendments; therefore, power uprate requests are submitted to the NRC as license amendment requests. This process is governed by 10 CFR 50.90, 50.91 and 50.92

   There is NRC guidance for the format and content of the NRC License Amendment Requests necessary to support any level of power uprate. This guidance is NRC forms RIS 2002-03 for

Margin Uncertainty Recapture and RS-001 for Extended Power Uprates, which are available from the NRC's website

There are extensive requirements and guidance associated with NRC License Renewal. The actual rule is Title 10 of the Code of Federal Regulations, Part 54. Guidance for application format and content are contained in industry guidance (NEI 95-10, Revision 6) and NRC Regulatory Guide 1.188, Revision 1.

Transformer and Steam Generator replacements are standard (albeit large) maintenance activities. There are no requirements for NRC approval and thus no guidance associated therewith except for standard guidance for maintenance activities.

2. **During a pre-application meeting between Progress Energy and the District and Siting Offices, the need for an ERP permit for low-level waste storage areas was discussed. What is the anticipated date for submission of the ERP permit for the waste storage areas? Will the facilities be enclosed or unenclosed? FDEP-Siting requests that Progress Energy provide the applicable NRC requirements for the construction and monitoring of such facilities as well as confirmation of Progress Energy's intent to comply with those regulations.**

   Progress Energy does not expect to need to construct any new or expanded onsite low-level nuclear waste storage areas as a result of the CR3 Uprate Project, therefore, an ERP permit is not required. In the event a new waste storage area is required to accommodate storage of the steam generator components associated with the steam generator replacement project, the appropriate permits and agency authorizations will be acquired, separate from this certification process.

   Applicable NRC low-level waste regulations are found in 10 CFR 61. Florida is an Agreement State with the NRC and the Florida Department of Health regulates low level wastes under an agreement with the NRC and pursuant to NRC-approved state regulations in Chapter 404, Florida Statutes and Rule Chapter 64E-5, F.A.C. As such, Progress Energy complies with these state regulations.

3. **The application states that spent fuel will continue to be stored in the NRC approved storage areas. Are these areas fuel pools? Are there also dry cask storage areas on site? Please provide a brief description of the storage areas, including size. Explain why these storage areas do not require any state or local permits? Does Progress Energy anticipate the need to construct additional spent fuel storage areas?**

   Spent Fuel from the CR3 reactor will continue to be stored in the existing NRC-licensed spent fuel pools. There are two such pools with sufficient storage capacity to maintain a full core reserve through 2013. At that time it will be necessary to either begin shipping spent fuel to a permanent repository or to provide additional storage. If and when Progress Energy finds it necessary to augment site storage with dry cask storage it will likely require necessary approvals under the requested CR3 SCA as well as NRC approvals. There are no dry cask storage facilities at the site currently.

4. **The Department is certifying Unit 3, a 1,080 MW nuclear unit. As such, all permitting activities associated with a certified unit are handled under the certification process. Please explain the relevance that the steam generator replacement project (SGRP) is**

being addressed by Progress Energy separately from the uprate project undergoing the certification process, since the entire Unit 3 will ultimately be certified. Please explain what components make up the "once-through" steam generator described in the application on page 3-2. If the steam generator was not being replaced due to degradation, would it be capable of accommodating the planned ultimate power increase to 1080 MW? Please supply the nameplate ratings of the existing and new steam generators. Have there been &y other changes/upgrades to the existing steam generator?

The replacement of the existing steam generators is an otherwise necessary maintenance activity that is completely unrelated to the requested power increase. The steam generator replacement does not increase the unit's steam electric generating capacity under section 403.506, F.S. The later uprate project will result in such an increase in steam electric generating capacity due to an increase in the maximum electrical generator rating. The steam generator project will be undertaken regardless of the CR3 Uprate Project addressed in the SCA, and will occur before commencement of construction for the CR3 Uprate Project. The steam generator project will require development of new onsite lay down areas for construction materials. Thus, since the steam generator replacement project is a separate required project, Progress Energy will seek ERP permits for the laydown area separate from the pending site certification application. These laydown areas will generally be common to all the units on the site and not singularly associated with CR3. They will not be part of the permanent certified site for the CR3. The necessary permits associated with lay-down and pre-fabrication areas are therefore being pursued separately.

Both the existing and replacement once through stream generators are very large single-pass, tube-and-shell heat exchangers. They transfer heat from the Reactor Coolant System to the main steam system which in-turn transports the energy to the turbines which drive the electrical generator converting a portion of the energy to electrical power. Both the existing and replacement steam generators are designed for the current power level but can be qualified to the higher power levels without physical modifications.

CR3 was initially licensed to operate at a maximum of 2,452 megawatts-thermal. In 1981, the NRC approved operation of CR3 at up to 2,544 MWth. On June 5, 2002, Florida Power submitted a License Amendment Request seeking NRC approval to operate at a power level of 2,568 MWth. The letter accompanying the request noted that this was a "stretch uprate" involving changes in set points, and would not have a significant effect on health, safety, or the environment. On December 6, 2002, NRC approved the request, noting that it would increase the generating capacity of the plant by 0.9 percent, from 895 megawatts electric to 903 megawatts electric. The CR3 Final Safety Analysis Report (FSAR) is more specific, referring to the 903 MWe value as the plant's "maximum continuous gross electrical output." Progress Energy normally reports the plant's generating capacity as 838 MWe (net summer capacity), which is the amount of power actually supplied to the regional grid in summer, the time of peak demand. None of these changes nor those proposed in this project necessitated physical modifications to the steam generators

5. **On page 3-1 of the application included in a discussion of first phase occurrences, is the following language: "The existing steam turbine high-pressure rotor was designed in the 1960s and is a multi-piece assembly which causes more drag than current technology deems necessary. Progress Energy will replace the outdated rotor with current rotor**

blade technology. "However, on page 4-1, it is stated that Progress Energy will retrofit the high-pressure turbine during Phase 11. Please clarify what this means.

The two terms "replace" and "retrofit" describe the same activity. The low pressure steam turbine modifications can be described as either a replacement or an extensive retrofit. Significant portions of the steam turbines are being completely replaced, some slightly modified and the shell left essentially as-is.

6. **After consideration of items in question 4 above, please explain why Progress Energy intends to request authorization for site disturbance of those areas that will be used to support construction activities related to the SGRP and CR3 Uprate project through a separate ERP application.**

Certain of the activities to support replacement of the steam generators or unrelated activities may begin well before the power uprate, and are required regardless of the Uprate Project. Some of these activities require ERPs. The SCA process may not be completed in time to support these steam generator replacement activities. Other areas (involving areas common to the adjacent fossil sites or distant to CR3) will remain appropriately addressed by the ERPs.

7. **On page 3-2 of the-SCA, "Main step-up transformer replacement" is included in the list of "Other Onsite Projects not subject to this SCA." Provide the nameplate rating on the existing and new transformers. If there were no degradation of the existing transformer, would the transformer be capable of accommodating the planned ultimate power increase to 1080 MW?**

The current main step-up electrical transformers are rated for 320 kVA per phase and the replacements are rated for 400 kVA per phase. They are being replaced as a normal maintenance activity due to age related degradation that has already led to two in-service failures. The replacement transformers are being replaced in 2007. The replacement transformers were sized to support future uprates but are not funded, managed or designed as part of the uprate project. Further, these are well within the area proposed to be covered by the site certification and no ERPs were required to support their installation. They were addressed in the discussion simply for completeness.

8. **Please provide an estimate of the annual CO_2 emissions associated with Unit 3 as a certified 1080 MW nuclear unit.**

The increased generation of electricity at the CR3 site does not produce any greenhouse gases including CO_2. While the uprate project and proposed additional cooling towers, referred to as the South Cooling Towers (SCT) will result in an increase in air emissions for particulate matter (PM), other combustion-related air emissions, including emissions of CO_2, will not be affected. There will be no additional fuel combustion sources (e.g., additional diesel generator capacity) or increase in existing fuel firing capability associated with this proposed project.

2.0 FLORIDA DEPARTMENT OF TRANSPORTATION

The Department will need the following additional information to evaluate the application:

1. **The impact of the construction workforce needs to be expanded to include all assumptions such as, will there be shifts, how many workers per shift, how many workers per car, volume by direction of travel, and anticipated method of conveyance.**

Response – The impact of construction workforce activities were assumed for the future conditions, such as direction of travel, number of workers per car, and number of shifts per day from a trip generation survey performed at the existing facility as part of the data collection process, and the existing trip characteristics were assumed for future conditions.

The workforce includes both engineering and technical staff, as well as field construction workers. During peak periods all of these workers are scheduled for split shifts (typically 10 or 12 hours, seven days a week with different days off). Thus, the total work force is never on site (or arriving) at the same time. Further, different work start times are used to spread out the impact at all the potential congestion points.

As discussed from our meeting, the applicant will provide mitigation for the construction activity as needed so that the demand of these vehicles can be controlled with little impact to the typical operation to U.S. Highway 19. The applicant already plans to take these measures as needed to deal with congestion at its Access Control Points leading onto the nuclear site and into the nuclear facility. These travel demand measures include:

- Utilizing Citrus County Sheriff Officers to monitor the intersection of U.S. Highway 19 and Power Line Road for major activities.
- Staging construction vehicles so that they do not all arrive to the facility at the same time, and to help spread out the peak influx of vehicles at the facility
- Coordinate construction and outage events so that they are scheduled at different times.

Quantitatively, the following traffic demand management strategies will be implemented to control the arrival/departure of site traffic:

- Approximately five to six out of every seven employees are expected on-site every day during outages; i.e., approximately 80 percent of the workers are expected to arrive on a typical day.
- The employee arrival will be split as 60/40 between days and nights; i.e., approximately 60 percent of the employees will arrive in the AM Peak Hour.
- Also, the peak traffic would be spread out over two hours as opposed to one hour; i.e. only 50 percent of the total peak hour traffic will arrive in the actual peak hour.

It should be noted that the total volumes in the June 2007 traffic study assumed a very conservative, worse case scenario where all construction activities would be occurring simultaneously in the year 2009 for the CR3, CR 4, CR 5 and SGRP (Stream Generator Replacement Project) projects. This scenario would not feasibly occur. More typical employment data expected at the facility for the peak hour has been incorporated into the analysis, which is enclosed with the revised Traffic Study (Appendix B).

2. **Analysis using highway capacity software to identify anticipated operational changes needed on U.S. 19 such as turn lanes, storage bays, signal timing, and related analysis for these items.**

   Response - The requested analysis is provided in HCS for the greatest volume scenario, which is the Temporary 2009 Build Scenario. The original analysis was performed in Synchro 7 in accordance to the methodologies contained in the Highway Capacity Manual (HCM) 2000, consistent with HCS software. Turn lane and signal timing information is provided.

   It should be noted that the existing traffic signal performs on an isolated, actuated timing plan with a variable cycle length. Currently, the northbound left turn operates as a protected-permitted movement with large gaps available from the minor southbound volume.

3. **Expansion of the impact of the trucks expected daily to include a description of the truck traffic population and frequency of arrival.**

   Response – Please refer to the response provided for Comment 1 above. Additionally, the trip generation survey performed for this facility identified the trip rates per hour for trucks. Therefore, the impact of the expected trucks was incorporated for population and frequency of travel.

4. **It is noted there are some discrepancies in the data and some inappropriate methodologies used. The following issues should be clarified:**

   4a. The traffic impact should be evaluated using peak hour directional standards, rather than two-way volume measurements.

   Response – Comment noted. The two-way volume standards were applied originally to represent a more conservative service volume capacity for study area determination. It should be noted that this does not change the Level of Service associated with the project results because the Level of Service was evaluated using more detailed computer software consistent with the HCM.

   4b. There are discrepancies in the volume data which need to be clarified. For example, Table 4.6.2-1 indicates that peak hour project volume on U.S. 19 will be 655; however, Figure 4.6.2-1 indicates there will be 966 northbound left turns and another 461 southbound right turns at the intersection of Power Line Road and U.S. 19.

   Response - The volume of 655 reflects the Year 2009 volumes from the project facility on the U.S. Highway 19 roadway south of Power Line Road. These volumes correspond with Figure 3.

   The volume of 966 northbound left turns and 461 southbound right turns from Figure 6 reflect a 2009 temporary, total traffic condition.

   It should be noted that the total volumes in the June 2007 traffic study assumed a very conservative, worse case scenario where all construction activities would be occurring simultaneously in the year 2009 for the CR3, CR4, CR5 and SGRP (Stream Generator Replacement Project) projects. This scenario would not feasibly occur. More typical

employment data expected at the facility for the peak hour has been incorporated into the analysis, which is enclosed with this letter.

3.0 SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Ownership Or Legal Control

The Water Use Permit (WUP) Basis of Review (B.O.R.), Section 2.1 (1) states Applicants must demonstrate ownership or legal control of all property on which pumps, wells, diversions or other water withdrawal facilities are or will be located.

Progress Energy currently operates its CR3 under a SWFWMD-issued individual water use permit, Permit No. 204695.03. See SCA Appendix 10.4.1. That permit was issued on October 27, 1997 and Progress Energy is seeking renewal of that permit. That permit authorizes a daily average allocation of 1,000,000 gpd which is used to meet the combined non-cooling water needs of the existing Crystal River Units 1, 2 and 3. (Crystal River Units 4 and 5 operate under a separate water use allocation granted pursuant to a Power Plant Site Certification for those two units.) CR3 receives its water needs from the existing common SWFWMD-permitted wellfield and a common onsite process water treatment facility that serves Units 1, 2, and 3. Progress Energy is not requesting any increase in the SWFWMD-permitted allocations for Units 1, 2 and 3, and does not propose to increase or change the non-cooling water uses for CR3 after the Uprate Project. Progress Energy proposes to maintain that water supply arrangement for CR Units 1, 2 and 3 in the future following certification of the CR3 Uprate Project and to continue to obtain the non-cooling water needs for CR3 under the existing individual water use permit and from the common water treatment facility. The District should address any questions regarding the WUP for CR 1, 2 and 3 in the on going permit renewal application.

1. **Please provide a copy of the Applicant's Warranty Deed for all parcels on which pumps, wells, diversions or other water withdrawal facilities are or will be located. Reference Rule 40D- 2.1 01, F.A.C.**

A copy of the deed in enclosed in Appendix C. Please see water use application 20004695.004 for further information.

Withdrawal Points And Quantities

Water Use Permit 20004695.003 currently includes 5 wells which supply water to Units 1, 2, and 3. The Site Certification Application states that 3 of the wells supply water to an existing water treatment plant and that Unit 3 receives and meters its supply from the treatment plant. For site certification, the quantities associated with Unit 3 will need to be separated from the water use permit quantities.

CR3 receives its water needs from the existing common SWFWMD-permitted wellfield and an onsite process water treatment facility that serves Units 1, 2 and 3. The wellfield and supply wells are uncertified, common facilities authorized to serve Units 1, 2 and 3. The WUP for CR 1, 2 and 3 is currently on going permit renewal. Water supplied to Unit 3 comes from a common facility; therefore, separation of the water use is not applicable.

2. **Please assert whether or not one or more specific wells will be designated to supply water for Unit 3 and if so, identify the well(s).**

No specific wells can or will be designated to supply water to CR3. Units 1, 2, and 3 use a common system to supply water. The South Plant is identified as Units 1 and 2 and water use data is not available split between the two units since they use common systems. Unit 3 Nuclear Plant purchases water from the water plant. South Plant use and CR3 Nuclear Plant use data is shown in the Table 6.

3. **Please provide several years of historical water use and a table listing the quantities needed for each unit (l, 2, and 3).**

   Historical water use data is not maintained for an individual unit. Water is pumped to a uncertified, common water treatment plant where it is supplied to all 3 units on an on demand basis.

4. **Please provide adequate information showing the distribution and use (water balance) of water from each well (PW-1A, PW-16, SPWS, SPW-4, and SPW-5).**

   There is no PW-16 associated with the CR 1, 2, and 3 WUP. This information is included in the current WUP renewal application. Please see the water balance diagrams in Appendix C.

5. **Please discuss the alternative power generation plans for when Unit 3 is being worked on. Will the work on Unit 3 result in any increase in water use for other units at the facility or at some other location in the District?**

   The CR3 uprate project will occur during scheduled routine maintenance and refueling outages. These outages are carefully scheduled such that any replacement power needs can be obtained from existing Progress Energy units or purchased from other utilities. All units at the facility will operate within permitted limits. There will be no new demand for water caused by the CR3 Uprate Project.

Flow Model Simulations and Impact Analysis

The District will need an impact analysis for reasonable assurance that the proposed project meets all substantive conditions for water use. The impact analysis should include analysis for the potential effects on nearby wetlands and nearby well owners. The applicant could use a finite-difference ground-water model (MODFLOW). The applicant may want to consider using the District-Wide Regulation Model- Version 2 (DWRM2) to create a focus model of the area and account for simulation of the possible effects on wetlands and/or nearby wells but model modification or a separate analysis would be needed to determine these effects. To acquire the latest version of this model, please contact Robert Peterson at (352) 796-7211, Extension, 2035.

6. **Please provide an impact analysis for the projected use. Please supply the MODFLOW input and output data files for the models submitted with the WUP application. The input and output data files should be submitted in digital formats. Please include files compatible with Groundwater Vistas. Model impact report guidelines are available from the Southwest Florida Water Management District.**

As part of its 1997 water use permit renewal, Progress Energy provided SWFWMD with an impact analysis for the authorized water allocation. That impact analysis demonstrated that there would be no adverse impact from the currently permitted withdrawals, including those for CR 3, and that the proposed water use met all of the District's water use permitting criteria. Progress Energy has recently submitted its water use permit renewal application to SWFWMD, Number 4695, which will contain a demonstration that the currently permitted allocation does not have an adverse impact and continues to meet the District's permitting criteria. Therefore, Progress Energy believes that since an impact analysis will be submitted as part of the separate water use permit renewal application, that it is unnecessary to separately submit such an analysis at this time for the CR 1, 2, and 3 permitted withdrawals.

Conditions For Issuance

In order to obtain authorization for the consumptive use of water pursuant to Part II of Chapter 373, F.S., an applicant must demonstrate that the water use is reasonable and beneficial, is consistent with the public interest, and will not interfere with any existing legal use of water. This must be accomplished by the applicant providing reasonable assurances on both an individual and cumulative basis, that the water use satisfies items (a) through (n) stated in Rule 40D-2.301 (I), F.A.C. The information submitted with the application did not include sufficient evidence to provide reasonable assurances of compliance with the permit issuance criteria. Rule 40D-2.301(3), F.A.C. states, 'Standards and criteria set forth in the "Basis of Review for Water Use Permit Applications" identified in Rule 40D-2.091, F.A.C. shall be used to provide the reasonable assurances required in Rule 40D-2.301 (I), F.A.C.

7. Please provide reasonable assurance as to how each of the conditions for issuance set forth in Rule 40D-2.301(l)(a) through (n), F.AC. will be met, on both an individual and cumulative basis. Please refer to the performance standards set forth in Chapter 4 of the B.O.R. for Water Use Permit applications. Reference Rule 4OD-2.301, F.A.C.

Response: Progress Energy is not seeking any change to the existing WUP. There will be no impact to the permitted withdrawal quantity as a result of the uprate project. Please see water use application 20004695.004 for further information.

4.0 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

The uprate project would modify the existing Crystal River Unit 3 complex to meet increased flow/intake requirements from the intake canal. The proposed modifications will require both additional flows from the intake canal while being augmented by recirculated water discharged into the intake canal; this increased flow would be accompanied by increased flow velocities over the intake screens.

Our primary concern is over the continued or increased impingement and entrainment of estuarine organisms due to the increased flow velocities at the intake screens. However, as noted in Section 5.1.2, Volume 1 of the application documents, Progress Energy Florida is in the process of quantifying baseline aquatic impingement and entrainment impacts at the Crystal River complex. Further, Progress Energy Florida intends to submit the data with an evaluation of impacts and identify measures to reduce impacts during the National Pollutant Discharge Elimination System (NPDES) permit renewal in 2009. Our Division of Marine Fisheries Management will be most interested in these data and results. We will review the information associated with the NPDES permit application and provide additional comments at that time.

Comment Acknowledged.

5.0 WITHLACOOCHEE REGIONAL PLANNING COUNCIL

Natural Resources – Air Quality

Under 1977 Clean Air Act Amendments, Citrus County classifies as a Class II area, and the Chassahowitzka National Wilderness Area classifies as a Class I Area. Because natural resources in the vicinity of the Crystal River Energy complex (CREC) have excellent ambient air quality, any new source of regulated emissions could have an adverse effect on these natural systems. Goal 4.14 and Policy 4.1.4.4, fro the (SRPP), provide general guidance on how to proceed.

Goal 4.1.4 Maintain the region's concentrations of all air pollutants for which standards have been established at levels less than the maximum allowed by state and federal standards

Policy 4.1.4.4 Consider the cumulative effects of development on air quality during project review; implement mitigation measures where needed to avoid a deterioration of ambient air.

The comment is acknowledged. Federal and state air regulatory requirements for a new source of air pollution are discussed in the air permit application that is presented in Appendix 10.1.5 of the SCA. The applicability of these regulations, including effects on ambient air quality, to the proposed modifications at the Crystal River Energy Complex are discussed in each respective section of the air application. These regulations must be satisfied before the proposed Project can be approved.

Transport – Roadway Level of Service (LOS)

The traffic impact survey accompanying the application indicates temporary construction traffic will adversely affect roadway level of service (LOS) for U.S.-19 during construction. The survey estimates level of service (LOS) D and C for peak hour AM traffic flow during 2009 and 2011, respectively. These levels of service are inconsistent with adopted levels of service for this road. The owner/developer should consider what mitigation actions might best be taken to maintain roadway (LOS) consistent with existing levels of service.

As a regionally significant roadway, US-19 is subject to guidance by (SRPP) policies and goals.

Policy 5.5.1 Levels of service for regionally significant roadways should be consistent with Florida Department of Transportation (FDOT) recommended Levels of Service requirements.

Policy 5.5.9 Coordinate land use plans and transportation planning efforts to ensure that land use decisions and transportation improvements are complementary.

Comment acknowledged.

Economic Development

Residual heat from the power generation process could have economic use. If explored, heat output from the plant could serve as input for other industry. WRPC staff encourage the owner/developer to investigate such possibilities. Such an approach would air efficient use of surplus energy, while facilitating new industry and markets. The (SRPP) supports such an innovative approach.

Policy 4.15.1 Use renewable (residual) energy sources whenever feasible

Policy 2.3.10 Increase intra-regional cooperation in attraction/expansion of industry dependent upon close proximity to one another or actual co-location.

Policy 2.3.7 Increase coordinated economic development activity through partnerships among education, businesses, industries, agriculture and the arts.

Comment acknowledged.

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