Attachment 14 – RAI answer from PEF

NRC Letter No.: ER-NRC

NRC Letter Date: February 24, 2009

NRC Review of Environmental Report

NRC RAI #: 5.3.3.2-1

Text of NRC RAI:

Provide additional information needed to assess the potential effects of salt deposition from the cooling tower operation on terrestrial, wetland and wildlife resources.

ER Section 5.3.3.2 describes the results of modeling for particle drift from the cooling tower. However, no isopleth maps of salt drift are provided, and discussion regarding the potential effects to biota from salt accumulation over time is limited. NRC staff requests the following items to assess the potential for impacts from cooling tower operation on terrestrial habitats:

- Isopleth maps of seasonal high projected salt drift and deposition (in kilogram per hectare per month [kg/ha/mo]) for the project site and vicinity.
- A discussion of potential impacts to flora and fauna from salt deposition or accumulation over the license period.
- Any studies on the impacts of salt accumulation on wetlands, plants, and wildlife (if such studies are available).
- The final report prepared for the salt deposition study at CREC.

PGN RAI ID #: L-0410

PGN Response to NRC RAI:

Isopleths depicting the maximum predicted monthly average deposition rate (in grams/m^2/month [g/m^2/mo]) are provided in Attachment 5.3.3.2-1A (Figures 1 through 5). The isopleths depict the maximum predicted monthly average deposition rates, relative to the locations of the cooling towers and the LNP site boundary, for each of the 5 years that were modeled (2001 through 2005), as described in ER Subsections 5.3.3.1 and 5.3.3.2. Deposition rates shown in the figures are based on 1.0 cycles of concentration in the cooling tower circulating water. Since normal operation of the cooling towers will be 1.5 cycles of concentration, isopleths of deposition during normal operation can easily be determined by multiplying the contour values by 1.5. The deposition rates in each figure are in units of g/m^2/mo. To convert to kilogram/hectare/month (kg/ha/mo), the isopleth values should be multiplied by 10.

As discussed in ER Subsection 5.3.3.2.1, results of a deposition analysis predicted a maximum predicted off-site deposition rate of 6.81 kilogram per hectare per month (kg/ha/mo) of total solids at the nearest property boundary (Figure 2, 2002 data year), below the NUREG-1555 threshold limit of 10 kg/ha/mo. This threshold limit is the value above which an adverse impact to vegetation may occur. The maximum predicted on-site deposition (during normal plant operation) is 10.75 kg/ha/mo, slightly above the NRC-assigned threshold. The maximum on-site deposition was predicted for the 2004 data year (Figure 4).

With regard to the salt deposition study that was performed at CREC, the study was performed at the request of FDEP as a condition of the facility's site certification, as well as its NPDES and PSD permits. The study was conducted from 1981 through 1995 to evaluate the physical impacts of salt deposition from that facility's natural and mechanical draft cooling towers on vegetation surrounding the CREC. The results of the study demonstrated that there were no significant impacts to vegetation in the area surrounding the plant resulting from cooling tower operation. In 1994 Florida Power Corp. (FPC, now PEF) requested approval to terminate the study. In March 1996, the FDEP concluded, based on the results of the study, that there were no significant impacts to vegetation due to salt drift from the plant and authorized FPC to discontinue the study. Attachment 5.3.3.2-1B contains a copy of FPC's April 25, 1994 letter to FDEP requesting approval to terminate the study, FDEP's March 20, 1996 response granting the request, and the final annual report that was submitted to FDEP for the 1992 – 1993 study year.

Long-term effects of salt drift on terrestrial habitats are not well documented, with only a limited number of studies reported in the public domain. Precipitation, humidity, species composition and photoperiod are known to influence salt tolerance, and extrapolating experimental salt deposition effects on vegetation to natural conditions is somewhat speculative due to the complexities of a natural habitat response.

As previously discussed, results of the 14-year CREC field study evaluating the effects of cooling tower drift on communities in the vicinity of the CREC show no significant impacts to the vegetative communities of maritime hammock, salt marsh, and pine flatwoods. Results of the CREC salt deposition study may be applicable to the LNP pine plantations, which shares common vegetative assemblages with the CREC.

Adverse impacts of salt drift on vegetation generally decrease with increasing distance from the cooling tower. Most areas in the immediate vicinity of the LNP cooling towers will be impacted as part of plant development. Many of the vegetative communities on the LNP site but beyond the immediate plant area are proposed for enhancement or restoration as part of the wetland mitigation program and will be monitored in accordance with the Conditions of Certification and Section 404 Permitting Guidelines.

Literature evaluating the long-term effects of salt accumulation on wetlands, plants, and wildlife is limited. Available studies that address the effects of salt drift and/or salt tolerance on terrestrial biota are the Salt Deposition Study at CREC, which is attached to this response as Attachment 5.3.3.2-1B, and "Review of Potential Biological Impacts of Cooling Tower Salt Drift" and "Effect of Photoperiod, Temperature, and Relative Humidity on Chloride Uptake of Plants Exposed to Salt Spray," both of which are available in the Progress Energy-provided Reading Room.

Associated LNP COL Application Revisions:

None

Attachments/Enclosures:

- 040 Attachment 5.3.3.2-1A.pdf
- 041 Attachment 5.3.3.2-1B Part 1 of 2.pdf
- 042 Attachment 5.3.3.2-1B Part 2 of 2.pdf