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ACCESSION NBR:8412100148 DOC.DATE: 84/11/29 NOTARIZED: NO DOCKET #
FACIL:50-389 St. Lucie Plant, Unit 2, Florida Power & Light Co. 05000389
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WILLIAMS,J.W. Florida Power & Light Co.
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MILLER,J.R. Operating Reactors Branch 3

SUBJECT: Forwards Florida Audubon Soc & Natl Marine Fisheries Svc comments on draft sea turtle entrapment study rept.Support in soliciting comments from US Fish & Wildlife Svc,EPA & Dept of Natural Resources requested.

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O. BOX 14000, JUNO BEACH, FL 33408

FLORIDA POWER & LIGHT COMPANY

November 29, 1984
L-84-344

Office of Nuclear Reactor Regulation
Attention: Mr. James R. Miller, Chief
Operating Reactors Branch #3
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Miller:

Re: St. Lucie Unit No. 2
Docket No. 50-389
Sea Turtle Entrapment Studies

On April 11, 1984, Florida Power & Light Company hosted a meeting to brief federal and state agencies regarding the Sea Turtle Entrapment Studies that had been conducted to satisfy the requirements of Section 4.2.2 of Appendix B to Operating License NPF-16. A draft copy of the report of the studies was distributed to each participant, and comments were solicited. Draft copies were also distributed to the Environmental Protection Agency, U.S. Fish and Wildlife Service, and Florida Audubon Society for review and comment. To date, comments have been received from the Florida Audubon Society and the National Marine Fisheries Service. These comments are attached.

In order to finalize the report, Florida Power & Light Company is requesting your support in soliciting comments from the U. S. Fish and Wildlife Service, the Environmental Protection Agency, and the Department of Natural Resources. We would appreciate all comments by December 31, 1984. A list of organizations that received the draft report is attached for your convenience.

Thank you for your cooperation.

Very truly yours,

for J. W. Williams, Jr.
Group Vice President
Nuclear Energy

JWW/RJS/cab

Attachments

A001
1/1

Memo to: Ross Wilcox
From: Peter C. H. Pritchard

November 2 1984

Comments on report entitled SEA TURTLE INTAKE ENTRAPMENT STUDIES

After reviewing the accounts of the type and condition of turtles caught in the canal system at the St. Lucie Plant, the procedures for releasing them to the ocean, and the results of the various experiments to deter turtles from entering the system, I share the conclusion that continued removal of entrapped turtles is an adequate response to the entrapment problem, and that if this is conducted conscientiously there should be no jeopardy to the populations of sea turtles on the Atlantic coast of Florida.

Beyond this, it might be added that it would be difficult for an experimenter to devise a more effective "random sampler" of the sea turtle populations in waters of the Central Atlantic coast of Florida, and the accidental entrapment holds the potential for generating much data of extraordinary interest on the relative numbers of each species in the area, the sex ratio, and the proportion of juvenile to mature turtles in the population. Virtually all other techniques of population sampling have obvious or subtle bias, resulting in selection for either certain species or certain life stages. Such techniques that have been used include pelagic surveys from aircraft (which select for larger individuals of species that spend relatively large amounts of time on the surface); nesting beach surveys, which obviously select for adult females only, and which fail to include adequate representation of species that may live or feed in Florida waters but which usually nest elsewhere; or trawler surveys, which may be somewhat more random that the previous two methods, but which preferentially catch the slower swimmers (i.e. Caretta), rarely catching fast turtles such as Chelonia or Dermochelys.

Review of the data in Appendix A already reveals some interesting findings. Thus, although visible populations of leatherback turtles (Dermochelys) are usually composed almost entirely of adults, immatures being regarded as rarely encountered, the specimens listed of this species include probably 50% immatures (if we regard those of carapace length of less than 125 cm as immature). Specimens of the green turtle (Chelonia mydas) include a large number of specimens in the 20-30 cm range of carapace lengths. The age of such turtles remains unknown -- recent observations suggest extremely slow growth rates for Chelonia in the 40-70 cm size range, when they have an herbivorous diet, but since turtles can be grown to this size within a year of hatching under captive conditions, they may represent yearlings. The complete absence of adult females in the sample, but the presence of three adult males, is of considerable interest, though interpretation of this finding would be largely speculative. The data on the immature turtles are sufficient to subject to statistical analysis to determine at what overall size sexual dimorphism, e.g. in tail length, and possibly also in relative shell dimensions, first becomes apparent.

The Caretta data, including a huge series of individuals, is particularly valuable. Again, the data could be subjected ~~to analysis~~ to statistical analysis to determine when and how sexual dimorphism first becomes apparent, though unfortunately these tables do not include tail length. Extant equations on allometric growth and appearance of sexual dimorphism in Caretta are generally unsatisfactory or based upon too few specimens, and the FPL data hold much potential for improvement of this situation.

The figures clearly show the absence of "small" loggerheads in Florida waters, and lend support to the theory that specimens between hatchling size and a carapace length of about 45 cm are particating in a circuit of the North Atlantic "gyre"; specimens in the missing size range are regularly caught in waters of the north-eastern Atlantic, including Spain, the Canary Islands, the Azores, and Madeira.

The largest specimens of Caretta recorded at St. Lucie appear to reach or exceed the maximum known size for the species. Such "giants" include NNC-415 (108cm male), HI-2151 (129 cm), and an untagged dead specimen with a 125 cm carapace. When such huge animals are found dead, they should be preserved if this is possible; if freshly dead they could be frozen and ultimately freeze-dried or otherwise prepared for exhibit; if rotten, they could be prepared as skeletons. At the minimum, accurate measurements should be taken of all loggerheads found that are over about 112 cm in straight line carapace length. I would also appreciate being advised by telephone when such animals are encountered.

As I discussed in my book Turtles of Venezuela, considerable interest attaches to formulae for relating head width of loggerheads to overall body size, and to also to quantify the reported greater relative head width of adult males. Some exceedingly flawed formulae have been perpetrated in print, and it would be valuable to have the data to set the record straight, especially for males, which of course are not encountered (except as occasional beach strandings) by turtle tagging crews. Routine measurement of maximum head width (across the "cheeks") of adult loggerheads of both sexes in addition to dimensions of carapace, plastron, and tail length, would allow these analyses to be undertaken, and it is highly desirable that this be undertaken. For animals being handled anyway, it would entail negligible extra work.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

Southeast Region
9450 Koger Boulevard
St. Petersburg, FL 33702

April 12, 1984 F/SER23:AM:cf

TO: FILES

FROM: F/SER23 - Andreas Mager, Jr.

SUBJECT: Meeting with Florida Power and Light Company on the Environmental Protection Plan for the St. Lucie Nuclear Power Plant

The subject meeting convened at 9:30 a.m. on March 11, 1984, in Ft. Pierce, Florida (a list of attendees is attached). The purpose of the meeting was to review the results of various methods to prevent turtle entrapment at the St. Lucie Nuclear Power Plant (SLNPP).

Background

The SLNPP became operational in 1976, employing an ocean intake and discharge for cooling water. The intake consists of two 12-ft. diameter pipes. A third 16-ft. diameter pipe was placed in 1983. Soon after the plant became operational, it was learned that turtles were being trapped by the SLNPP intakes. Most turtles were loggerheads, but greens and leatherbacks also were taken. So far, only one Kemp's ridley and one hawksbill have been trapped.

The Section 7 consultation initiated in 1982 with the Nuclear Regulatory Commission as the lead federal agency provided for certain programs by FP&L to prevent turtles from entering the SLNPP intakes. Studies were outlined in the April 1983, Environmental Protection Plan, Appendix B (Section 4.22). On completion of the program, FP&L was to submit a final report to NRC, EPA, NMFS, and FWS for evaluation. The subject meeting was held to brief the involved agencies on the results of FP&L's studies in preparation for submittal of the final report.

Discussion

FP&L has studied a number of methods aimed at preventing turtles from entering the intake pipes as follows:

1. Lights and bubble curtains - This technique involved the use of lights including (strobes) and bubbles in connection with the lights in an attempt to scare turtles away from the intake pipes. It was learned that this technique, while very effective on fish, did not work well for turtles;

2. Electrical fields - AC and DC electrical fields of varying intensites were studied as deterrents. Marine turtles avoided both AC and DC electrical fields of sufficient intensity. However, to place an array on the intake structures would require 400-600 A and would be extremely difficult to maintain in a high energy

environment. In addition to high electrical energy requirements, significant safety problems exist since an unguarded electrial source would be in an area used by commercial and recreational fishermen. This technique was, therefore, not feasible at SLNPP;

3. Pneumatic air guns - Air guns used for seismic exploration were tested as deterrents based on the idea of using sound and vibrations to scare turtles. This technique worked very well, but also proved infeasible for use at the SLNPP. Expenses involved with obtaining a large compressor, laying lines through a surf zone, installing air guns, and maintenance and operation were prohibitive. To study this technique alone would have cost between $720,000 for a six month study and $1,053,000 for a year-long study. Also, the air guns are not reliable enough to allow continued operation for long time periods; and

4. Physical barriers - Engineering studies were conducted of various physical barriers around the velocity caps to prevent turtles from entering the intakes. Problems encountered were high corrosion rates, high fouling probabilities (trash and biological), and very high maintenance and installation costs - both units of the SLNPP would have to be shut down to install barriers costing in the millions of dollars. Also, there appears to be a significant safety problem with the barriers. Should fouling occur, there would be a reduction in water needed to cool the nuclear units. FP&L, therefore, believes that physical barriers are also not feasible.

Since no effective and/or feasible methods were found to deter turtles from entering the intake pipes, FP&L proposes to continue their existing program of capturing and releasing turtles from the intake canal of the SLNPP. This recommendation will be part of the final report that NMFS will receive for review and comment.

Recommendations

Since initiation of FP&L's capture and release program for turtles trapped in the intake canal, significant improvements have been made in the capture techniques. Turtle deaths due to trapping have been greatly reduced and improvements continue to be made.

Additionally, discussions with the SEFC reveal that the plant site provides unique research opportunities and information generated on turtles at SLNPP has greatly enhanced our knowledge of sea turtle biology. In this regard, Ross Witham (FLDNR) proposed that FP&L consider construction of a research facility at the project site.

FP&L, in connection with the SLNPP, has also initiated a number of educational programs and materials that enhance public awareness of sea turtle conservation. These educational programs have considerably aided sea turtle conservation.

In view of the above, I recommend that FP&L be allowed to continue with their current capture and release program as well as other sea turtle conser-

vation programs. FP&L has adequately demonstrated that technology does not currently exist to deter turtles from entering the SLNPP intakes in a cost-effective manner.

Attachment

cc:
F/SEC, Fred Berry
F/M412
F/SER2
Ross Witham, FLDNR

AGENCIES CONTACTS FOR PSL TURTLE ENTRAPMENT PRESENTATION

1. National Marine Fisheries Service

   Mr. Andreas Mager
   Endangered Species Specialist
   National Marine Fisheries Service
   9450 Koger Blvd.
   St. Petersburg, FL 33702

2. U. S. Fish and Wildlife Service

   Mr. David Smith
   Endangered Species Coordinator
   U. S. Fish and Wildlife Service
   P.O. Box 2676
   Vero Beach, FL 32960

3. Environmental Protection Agency

   Dr. Ronald Raschke
   Ecology Branch
   U. S. Environmental Protection Agency
   College Station Road
   Athens, GA 30601

4. Department of Natural Resources

   Mr. Ross Witham
   Department of Natural Resources
   P.O. Box 941
   Jensen Beach, FL 33457

5. Florida Audubon Society

   Dr. P. C. H. Pritchard
   Florida Audubon Society
   1101 Audubon Way
   Maitland, FL 32751