NRC FORM 464 Part I (6-1998)

U.S. NUCLEAR REGULATORY COMMISSION

RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) / PRIVACY ACT (PA) REQUEST

FOIA/PA	RESPONSE NUMBER
2000-0182	1

RESPONSE TYPE ☑ FINAL ☐ PARTIAL

REQUESTER: Mr. Paul Gunter

DATE: MAY 02 2000

PART I. -- INFORMATION RELEASED

☐ No additional agency records subject to the request have been located.

☐ Requested records are available through another public distribution program. See Comments section.

☐ APPENDICES ____ Agency records subject to the request that are identified in the listed appendices are already available for public inspection and copying at the NRC Public Document Room.

☑ APPENDICES A Agency records subject to the request that are identified in the listed appendices are being made available for public inspection and copying at the NRC Public Document Room.

☐ Enclosed is information on how you may obtain access to and the charges for copying records located at the NRC Public Document Room, 2120 L Street, NW, Washington, DC.

☑ APPENDICES A Agency records subject to the request are enclosed.

☐ Records subject to the request that contain information originated by or of interest to another Federal agency have been referred to that agency (see comments section) for a disclosure determination and direct response to you.

☐ We are continuing to process your request.

☐ See Comments.

PART I.A -- FEES

AMOUNT * $

* See comments for details

☐ You will be billed by NRC for the amount listed.

☐ You will receive a refund for the amount listed.

☐ None. Minimum fee threshold not met.

☑ Fees waived.

PART I.B -- INFORMATION NOT LOCATED OR WITHHELD FROM DISCLOSURE

☐ No agency records subject to the request have been located.

☐ Certain information in the requested records is being withheld from disclosure pursuant to the exemptions described in and for the reasons stated in Part II.

☐ This determination may be appealed within 30 days by writing to the FOIA/PA Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001. Clearly state on the envelope and in the letter that it is a "FOIA/PA Appeal."

PART I.C COMMENTS (Use attached Comments continuation page if required)

SIGNATURE - FREEDOM OF INFORMATION ACT AND PRIVACY ACT OFFICER

Carol Ann Reed

APPENDIX A
RECORDS BEING RELEASED IN THEIR ENTIRETY
(If copyrighted identify with *)

NO.	DATE	DESCRIPTION/(PAGE COUNT)
1.	07/17/98	Letter from L.A. Wiens to J. P. Cowan; re: Request for Preparation of Biological Assessment for Crystal River Unit 3 (TAC NO. MA1706) (3 pages)
2.	06/08/99	Letter from C. A. Carpenter to R. Hoffman; re: Comments on Draft Biological Opinion Regarding Impact to Sea Turtles at the Crystal River Energy Complex (TAC NO. MA1706) w/encl. (7 pages)
3.	07/15/99	Letter from L.A. Wiens to J. P. Cowan; re: Crystal River Unit 3 - Section 7 Biological Consultation, Biological Opinion (TAC NO. MA1706) (29 pages)
4.	05/13/98	Sea Turtle Meeting Agenda (21 pages)
5.	10/01/98	Letter from R. E. Grazio to USNRC; re: Biological Assessment for Crystal River Unit 3 (TAC NO. MA1706) w/attachment (39 pages)
6.	01/21/00	Weekly Branch Chief Report (1 page)
7.	12/27/99	EVENT REPORT - 36541 (1 page)
8.	12/16/99	EVENT REPORT - 36520 (1 page)
9.	11/18/99	EVENT REPORT - 36448 (1 page)
10.	06/05/99	EVENT REPORT - 35800 (1 page)
11.	04/12/99	EVENT REPORT - 35581 (1 page)
12.	03/25/99	EVENT REPORT - 35509 (1 page)
13.	03/05/99	EVENT REPORT - 35441 (1 page)

14.	02/27/99	EVENT REPORT - 35417 (1 page)
15.	04/02/99	EVENT REPORT - 34007 (3 pages)
16.	03/28/99	EVENT REPORT - 33988 (2 pages)
17.	32/27/99	EVENT REPORT - 33979 (1 page)
18.	04/08/99	Letter from L.A. Wiens to J. P. Cowan; re: Draft Biological Opinion Regarding Impact to Sea Turtles at the Crystal River Energy Complex (TAC NO. MA1706) (24 pages)
19.	10/12/99	Letter from J. J. Holden to USNRC; re: License Amendment Request #253, Revision 0 (27 pages)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001
July 17, 1998

Mr. John Paul Cowan, Vice President
Nuclear Operations (NA2E)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: REQUEST FOR PREPARATION OF BIOLOGICAL ASSESSMENT FOR CRYSTAL RIVER UNIT 3 (TAC NO. MA1706)

Dear Mr. Cowan:

On May 13, 1998, members of the Nuclear Regulatory Commission (NRC) staff, the Florida Department of Environmental Protection (FDEP), the National Marine Fisheries Service (NMFS), and Florida Power Corporation (FPC) met to discuss recent experiences with endangered sea turtles at the Crystal River (CR) site. During the meeting, FPC outlined the plant layout, the recent influx of endangered sea turtles into the CR canal system, and the actions FPC has taken in response to the increased influx of sea turtles into the CR site. In accordance with the Endangered Species Act and 50 CFR Part 402, Interagency Cooperation - Endangered Species Act of 1973, as amended, it was determined that the consultation process should be initiated. As allowed by Section 402.08, the NRC designates FPC, as a non-Federal representative, to conduct consultation activities, including preparation of a biological assessment (BA). The BA should be provided to the NRC through the normal submittal processes to the Document Control Desk by October 1, 1998.

If you have any questions regarding this request, please contact me at (301) 415-1495 or Ms. Claudia M. Craig at (301) 415-1053.

Sincerely,

Leonard A. Wiens, Senior Project Manager
Project Directorate II-3
Division of Reactor Projects I/II
Office of Nuclear Reactor Regulation

Docket No. 50-302

cc: See next page

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Mr. John Paul Cowan
Florida Power Corporation

cc:
Mr. Roy A. Anderson, Senior Vice President
Energy Supply
Florida Power Corporation
ATTN: Manager, Nuclear Licensing
Crystal River Energy Complex (SA2A)
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. R. Alexander Glenn
Corporate Counsel
Florida Power Corporation
MAC-A5A
P.O. Box 14042
St. Petersburg, Florida 33733-4042

Mr. Charles G. Pardee, Director
Nuclear Plant Operations (NA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. Robert B. Borsum
Framatome Technologies Inc.
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. Bill Passetti
Office of Radiation Control
Department of Health and
Rehabilitative Services
1317 Winewood Blvd.
Tallahassee, Florida 32399-0700

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Chairman
Board of County Commissioners
Citrus County
110 North Apopka Avenue
Inverness, Florida 34450-4245

Mr. Robert E. Grazio, Director
Nuclear Regulatory Affairs (SA2A)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Senior Resident Inspector
Crystal River Unit 3
U.S. Nuclear Regulatory Commission
6745 N. Tallahassee Road
Crystal River, Florida 34428

Mr. Gregory H. Halnon
Acting Director, Quality Programs (SA2B)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW., Suite 23T85
Atlanta, GA 30303-3415

Mr. Robert P. Schin
U.S. Nuclear Regulatory Commission
61 Forsyth Street, SW., Suite 23T85
Atlanta, GA 30303-3415

cc:

Ms. Colleen Coogan
Section 7 Coordinator
National Marine Fisheries Service
Southeast Region
Protected Species Division
9721 Executive Center Drive North
St. Petersburg, Florida 33702

Mr. Alan Foley
Florida Marine Research Institute
100 Eighth Ave., S.E.
St. Petersburg, FL 33701

Environment file

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 8, 1999

Mr. Robert Hoffman
National Marine Fisheries Service
Southeast Region
Protected Species Division
9721 Executive Center Drive North
St. Petersburg, FL 33702

SUBJECT: COMMENTS ON DRAFT BIOLOGICAL OPINION REGARDING IMPACT TO SEA TURTLES AT THE CRYSTAL RIVER ENERGY COMPLEX (TAC NO. MA1706)

Dear Mr. Hoffman:

By letter dated October 1, 1998, Florida Power Corporation (FPC) provided to the United States Nuclear Regulatory Commission (NRC) a Biological Assessment of Impact to Sea Turtles at Florida Power Corporation's Crystal River Energy Complex (BA). The BA was prepared by FPC to support a Section 7 consultation with the National Marine Fisheries Service (NMFS) under the Endangered Species Act and the issuance of a biological opinion (BO). By letter dated October 14, 1998, the NRC provided the BA and the NRC staff's recommendation to NMFS. Based on the BA and NRC recommendation, NMFS completed a draft BO which was forwarded by the NRC to FPC for review and comment on March 30, 1999.

The NRC and FPC have completed review of the draft BO issued by NMFS. FPC written comments were provided to the NRC by letter dated May 24, 1999, and are provided as Enclosure 1. NRC comments are provided as Enclosure 2.

Please contact Ms. Cynthia Sochor at 301-415-2462 with any questions or comments.

Sincerely,

Cynthia A Carpenter

Cynthia A. Carpenter, Branch Chief
Generic Issues, Environmental, Financial, and
Rulemaking Branch
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Enclosures: As stated

cc w/ enclosure: See next page

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Florida Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

May 24, 1999
3F0599-20

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

Subject: Comments on the Draft Biological Opinion Regarding Impact to Sea Turtles at the Crystal River Energy Complex (TAC No. MA1706)

Reference: NRC to FPC letter, 3N0499-04, dated April 8, 1999, "Draft Biological Opinion Regarding Impact to Sea Turtles at the Crystal River Energy Complex (TAC No. MA1706)"

Dear Sir:

This letter encloses Florida Power Corporation's comments on the above referenced National Marine Fisheries Service's April 8, 1999, draft biological opinion.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Manager, Nuclear Licensing at (352) 563-4883.

Sincerely,

S. L. Bernhoft
Director, Nuclear Regulatory Affairs

SLB/smg

Attachment

xc: Regional Administrator, Region II
NRR Project Manager
Senior Resident Inspector

Enclosure 1

Comments on the National Marine Fisheries Service's Draft Biological Opinion Regarding Impact to Sea Turtles at the Crystal River Energy Complex

General Comments

Florida Power Corporation (FPC) concurs with the environmental baseline information provided in the draft Biological Opinion (Sections I – VII), except for the minor and specific comments below. This environmental baseline information is comprehensive and descriptive of the environmental factors existing near the Crystal River Energy Complex (CREC).

Section VIII. Incidental Take Statement

The sea turtle influxes in the CREC intake canal have been documented to vary widely between approximately 2 to 50 sea turtles annually. Since conditions at the plant site have not changed significantly, the large variation is likely due to environmental factors unrelated to operations at the CREC.

FPC believes that a numerical limit on live takes is not necessary to ensure protection of the sea turtle population. However, if established, it should be averaged over a longer time period to allow for periodic higher influxes. Accordingly, FPC recommends that the time period on the live incidental take limit be extended, but without increasing the annual average value. FPC recommends the time period be averaged over a three or five year period. The allowed live incidental take therefore would be increased to 75 over a three year time period or 125 over a five year period. This allows the annual levels to still be averaged at the National Marine Fisheries Service's (NMFS) original proposed level of 25 per year (biennially 50).

Lethal Takes

The draft biological opinion makes an appropriate distinction between mortalities being causally or non-causally plant related. This distinction further encourages FPC to maintain an aggressive sea turtle rescue program to prevent mortalities. However, FPC recommends the lethal incidental take limit also be averaged over the same time span as that recommended for the live incidental takes. This would result in a lethal take limit of no more than 7 sea turtles over a three year period or 12 over a five year period.

Section IX. Conservation Recommendations

FPC believes that Conservation Recommendation #1 should be deleted. Tissue sampling of sea turtles is normally performed to determine associations between nesting populations. While tissue sampling may be appropriate for other sea turtle species, tissue sampling of Kemp's ridleys is unnecessary since the entire Gulf population is associated with one nesting beach in Mexico. Since genotypes typically overlap, a large sampling population is needed to look at the frequency of genotypic variations. In addition, tissue samples are typically collected from dead specimens, and the low number of sea turtle mortalities occurring at the CREC would not provide a sufficient number of tissue samples for the data to be of significance.

FPC concurs with Conservation Recommendation #2 which states that a tagging program should be established in conjunction with the Florida Department of Environmental Protection (FDEP).

FPC believes that Conservation Recommendation #3 should be modified to a recommendation that FPC continue evaluation of methods to reduce sea turtle takes. FPC's concern is that a diversionary structure in the CREC intake canal is not likely an effective means of reducing sea turtle takes.

Specific Comments

Section II. Description of the Proposed Action

The exact schedule for the bar rack inspection program is based on sea turtle observations and the judgement of the CREC environmental staff. The dates of "February through May" should be qualified with "e.g., February through May" and are "normally" inspected once every two hours during other times of the year.

Section V. Effects of the Action

Paragraph 3, replace "moralities" with "mortalities"

Paragraph 6, replace "biannually" with "biennially". Replace BSEP with CREC

Section VIII. Incidental Take Statement

In Paragraph 3, the take numbers are inconsistent with Section V, the last paragraph. The Section V paragraph states that the live takes may reach 50 sea turtles rescued alive from the bar rack biennially and 5 lethal takes, whereas Section VIII, paragraph 3, states 50 takes with 5 being lethal. FPC recommended in its Biological Assessment that specific numerical limits not be included. However, if specific numerical limits must be included, a clarification of intent is needed as to whether the lethal take limits are inclusive or exclusive of the live take numerical limits.

NRC Comments on the National Marine Fisheries Service's Draft Biological Opinion Regarding the Impact to Sea Turtles at the Crystal River Energy Complex

Section: The Proposed Action

(5th paragraph, 1st sentence)
"The bar racks are inspected 24 hours a day during times of high turtle concentrations in the intake canal (February through May) and once every two hours during other times of the year."

Comment 1: This statement is not consistent with Florida Power Corporation's biological assessment. The bar racks are inspected 24 hours a day with a minimum observation schedule of once every two hours during periods of known turtle presence. Periodic observations are provided at other times.

Section: Effects of the Action

(Last paragraph)
"Based on this information, and the fact that another anomalous year such as 1998 is possible, NMFS believes that the level of live take of sea turtles in BSEP's intake canal may reach 50 sea turtles rescued alive from the bar racks biannually and 5 lethal takes, biannually that are casually related to plant operation."

Comment 2: This statement conflicts with the Incidental Take which states "50 sea turtles with 5 being lethal." The effects statement appears to state that turtle live and lethal takes may reach 55 with 5 of those takes being lethal.

Section: Incidental Take Statement

(1st paragraph, last sentence)
"Only incidental taking resulting from the agency action as described in the proposed action of the biological opinion, including incidental takings caused by activities approved by the agency, and that comply with the specified reasonable and prudent measures and terms and conditions, are exempt from the takings prohibition of section 9(a), pursuant to section 7(o) of the ESA."

Comment 3: Is the agency action as described in the proposed action section referring to general plant operation or specifically to the intake and discharge of cooling water into and out of the nuclear plant? Would plant operations not specifically related to the intake or discharge of cooling water into the nuclear plant that resulted in a lethal take be exempt from the takings prohibition of section 9(a)?

Section: Conservation Recommendations

(Bullet 1)
"1. CREC should conduct tissue sampling for the genetic identity of turtles interacting with plant cooling water intake system."

Comment 4: What is the purpose of conducting tissue sampling?

(Bullet 3)
"3. CREC should continue working on a design for diversion structures, which would be used to keep sea turtles away from the bar racks."

Comment 5: Limiting CREC to continue to work on a design for diversion structures would prevent CREC from exploring different alternatives that may be more effective and cost beneficial. CREC could be asked to continue to research methods to lessen the impacts of sea turtle impingement on the intake bar racks without prescribing a specific means of achieving the desired end result.

Mr. John Paul Cowan
Florida Power Corporation

cc:
Mr. R. Alexander Glenn
Corporate Counsel (MAC-BT15A)
Florida Power Corporation
P.O. Box 14042
St. Petersburg, Florida 33733-4042

Mr. Charles G. Pardee, Director
Nuclear Plant Operations (PA4A)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. Michael A. Schoppman
Framatome Technologies Inc.
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circle, SE, Bin #C21
Tallahassee, Florida 32399-1741

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Chairman
Board of County Commissioners
Citrus County
110 North Apopka Avenue
Inverness, Florida 34450-4245

Ms. Sherry L. Bernhoft, Director
Nuclear Regulatory Affairs (NA2H)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Senior Resident Inspector
Crystal River Unit 3
U.S. Nuclear Regulatory Commission
6745 N. Tallahassee Road
Crystal River, Florida 34428

Mr. Gregory H. Halnon
Director, Quality Programs (SA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Florida State Clearinghouse
Department of Community Affairs
2555 Shumard Oak Boulevard
Tallahassee, Florida 23399-2100

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

July 15, 1999

Mr. John Paul Cowan
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing (SA2A)
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: CRYSTAL RIVER UNIT 3 - SECTION 7 BIOLOGICAL CONSULTATION, BIOLOGICAL OPINION (TAC NO. MA1706)

Dear Mr. Cowan:

Enclosed is the Biological Opinion issued by the National Marine Fisheries Service (NMFS) of the Department of Commerce. NMFS has concluded that the operation of the cooling water intake system of the Crystal River Energy Complex is not likely to jeopardize the continued existence of species listed in the Biological Opinion under their jurisdiction. However, operation of the intake system is likely to result in the incidental take of these species, and therefore NMFS has developed an Incidental Take Statement, which is included with the Biological Opinion, which includes terms and conditions necessary to monitor and minimize the lethal take of sea turtles at the Crystal River Energy Complex.

In order for the U.S. Nuclear Regulatory Commission to fulfill its responsibility under Section 7 of the Endangered Species Act, as detailed in Title 50, Code of Federal Regulations (50 CFR) Part 402, it is requested that Florida Power Corporation propose appropriate changes to the Environmental Protection Plan, Appendix B of the Crystal River Unit 3 license, within 90 days of receipt of this letter. These proposed changes should reference the Incidental Take Statement included in the enclosed Biological Opinion and provide that the reasonable and prudent measures, and the terms and conditions, as detailed in the Incidental Take Statement, will be implemented.

Sincerely,

L. A. Wiens, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-302

Enclosure: Biological Opinion

cc w/encl: See next page

A/3

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

Mr. Thomas H. Essig
Acting Chief
Generic Issues and
Environmental Projects Branch
Division of Reactor Program Management
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Dear Mr. Essig:

This document transmits the National Marine Fisheries Services's (NMFS) biological opinion (BO) based on our review of the continued use of the cooling water intake system at the Crystal River Energy Complex (CREC). CREC is located near the Gulf of Mexico in Citrus County, Florida. This BO reviews the effects of this activity on species of sea turtles protected by the Endangered Species Act (ESA). In addition, the opinion concludes that the continued use of the intake system is not likely to adversely affect the Gulf sturgeon. This BO is prepared in accordance with section 7 of the ESA 1973 as amended (16 U.S.C. 1531 et seq.).

This biological opinion is based on information provided in the Nuclear Regulatory Commission's (NRC) biological assessment dated October 1, 1998 and three meetings among NMFS, NRC, and CREC personnel held in May 1998, April 1998, and March 1999. The biological assessment analyzed the impacts to sea turtles caused by operations at Florida Power Company's Crystal River Energy Complex. A complete administrative record of this consultation is on file at the NMFS Southeast Regional Office.

We look forward to further cooperation with you on other NRC activities to ensure the conservation and recovery of our threatened and endangered marine species.

Sincerely,

Hilda Diaz-Soltero
Director
Office of Protected Resources

Enclosure

Endangered Species Act - Section 7 Consultation
Biological Opinion

Agency:	United States Nuclear Regulatory Commission
Activity:	Cooling water intake system at the Crystal River Energy Complex
Consultation Conducted By:	National Marine Fisheries Service, Southeast Region

I. History of the Consultation

This consultation was initiated by the Nuclear Regulatory Commission (NRC) by a letter dated October 14, 1998, with an attached biological assessment (BA); received by the National Marine Fisheries Service (NMFS), Southeast Regional Office (SERO), Protected Resources Division on October 22, 1998. The consultation was initiated because Crystal River Energy Complex (CREC) has documented the take of sea turtles protected by the Endangered Species Act at the cooling water intake structures of the complex. There have been no previous consultations completed on the operations of CREC. The BA analyzes the effects of the cooling water system on species of sea turtles protected by the Endangered Species Act (ESA), at CREC. This biological opinion (BO) is based on information provided in the biological assessment; various telephone conversations and a May 13, 1998 meeting involving NMFS SERO, Florida Power Corporation (FPC), and NRC staff; an April 23, 1998 site visit by Mr. David Bernhart and Ms. Colleen Coogan of the SERO; a March 24, 1999 site visit by Mr. Bob Hoffman of the SERO; and other sources of information. A complete administrative record of this consultation is on file at the NMFS Southeast Regional Office.

II. Description of the Proposed Action

Action Area

The CREC is located on an approximate 5,000 acre site near the Gulf of Mexico in Citrus County, Florida. The Complex is approximately 7.5 miles northwest of the city of Crystal River, within the coastal salt marsh area of west central Florida. The action area consists of 3 of the 5 power plants (plants 1,2 and 3) that make up CREC, the 2.8 mile discharge canal, intake canal, and intake structures, which includes the bar racks, traveling screens, and sea water pump components. The intake canal is a dredged canal approximately 14 miles long with an average depth of 20 feet (the area of the intake canal has a natural rock bottom starting under the initial layer of sand and sediment. The depth of the sand and sediment layer varies greatly in the area.

The canal was dredged through the sand and sediment leaving a rock bottom that extends the length of the canal). The canal is bordered on both sides by land beginning from the plant site and extending 3 miles to the west. The canal then extends westward an additional 11 miles out into the Gulf of Mexico (map at attachment 1).

The Proposed Action

The CREC contains five separate power plants. Unit 1 is an approximately 400MW electric (MWe) coal-fueled plant. Unit 2 is an approximately 500 MWe coal-fueled plant. Unit 3 is an approximately 890 MWe pressurized water, nuclear-fueled plant. Units 4 and 5 are two coal-fueled plants at approximately 640 MWe each. This consultation will analyze the cooling water intake systems for units 1, 2, and 3.

The intake structures for units 1, 2, and 3 are concrete structures with bar racks, traveling screens, and seawater pump components. Surface water trash barriers are deployed in front of the bar racks to collect large floating debris. Water is drawn from the intake canal through the bar racks, through the traveling screens, into the pumps and flows through the plants condensers and auxiliary systems. The water is then discharged through an outfall into the discharge canal. The discharge canal directs water back to the Gulf of Mexico.

The intake bar racks prevent trash and large debris carried by the seawater from entering the intake structure. The seawater must pass through the bar racks which are made of steel bars spaced on 4 inch centers. The bar racks extend from well above the water line to the concrete base at the bottom of the intake canal. Debris and marine life smaller than the bar rack openings pass through the bar racks. The traveling screens effectively remove this floating or suspended debris from the intake water. Intake water passes through these screens, which suspend debris and solid materials onto the screens. The screens are conveyed upwards to an overlapping water spray system which washes these materials off the screens and into a debris trough. The traveling screen system is operated approximately three times a day.

Each of the three plants that use seawater to cool, have four large circulating pumps used to draw seawater into the plant. The water is then pumped through the condensers and out to the discharge canal. On units 1 and 2, the total design flow is 638,000 gallons per minute (g.p.m). Unit 3 design flow is 680,000 g.p.m. In addition, unit 3 has a low flow nuclear services water pumping system with a normal flow rate of approximately 10,000 g.p.m. Under emergency conditions, additional pumps would increase this flow up to approximately 20,000 g.p.m. From the discharge of the pumps the water flows to the main condensers; and for unit 3, an additional flow path exists for the nuclear services and decay heat cooling water heat exchangers. After the seawater passes through the tubes of the condenser and/or heat exchangers, the seawater is transported in underground pipes to the discharge canal. The discharge canal directs the water back to the Gulf of Mexico.

The bar racks are inspected 24 hours a day during times of high turtle concentrations in the intake canal (February through May) and once every two hours during other times of the year. If a turtle is stranded on the bar racks it is immediately recovered with dip nets. Healthy turtles are placed in a holding tank at the CREC Mariculture Center, where Mariculture Center Staff members determine the proper disposition of the turtle, in conjunction with Florida Department of Environmental Protection (FDEP) personnel. Non-healthy turtles are also taken to the Mariculture Center with disposition to be determined by FDEP. Dead turtles are sent to the Mariculture Center and picked up by FDEP.

III. Status of Listed Species and Critical Habitat

The following listed species under the jurisdiction of NMFS are known to occur in the Gulf of Mexico:

Endangered

Green sea turtle	*Chelonia mydas*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's ridley sea turtle	*Lepidochelys kempii*

Sperm whales (*Physeter macrocephalus*), occur in the Gulf of Mexico but are rare in state waters. Other endangered whales, including North Atlantic right whales (*Eubalaena glacialis)* and humpback whales (*Megaptera novaengliae*), have been observed occasionally in the Gulf of Mexico. The individuals observed have likely been inexperienced juveniles straying from the normal range of these stocks. NMFS does not believe that there are resident stocks of these species in the Gulf of Mexico, and these species are not likely to be adversely affected by projects in the Gulf.

Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

Threatened

Loggerhead sea turtle	*Caretta caretta*
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*

No critical habitat for listed species under the jurisdiction of NMFS has been designated in the action area.

Biology and Distribution

Sea Turtles

Five species of sea turtles occur in Gulf of Mexico waters. Kemp's ridley and loggerhead turtles are the most common turtle species found in the Gulf as evidenced by strandings. However leatherbacks are not uncommon and hawksbill and green turtles occur regularly within stranding and incidental capture records. Historical accounts of the occurrence of sea turtles in Texas, Louisiana and Florida waters are consistent with current observations, although fluctuations in populations are apparent (Fuller, 1978, Cox and Mauermann, 1978, and Fuller and Tappan, 1986). Commercial fisheries remain the major known direct cause of sea turtle takes.

Green turtle (*Chelonia mydas*)

Green turtles are distributed circumglobally, mainly in waters between the northern and southern 20°C isotherms (Hirth, 1971). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and fisheries in the United States and throughout the Caribbean are largely to blame for the decline of the species.

In the western Atlantic, several major nesting assemblages have been identified and studied (Peters, 1954; Carr and Ogren, 1960; Parsons, 1962; Pritchard, 1969; Carr *et al.*, 1978). In the continental United States, green turtle nesting occurs on the Atlantic Coast of Florida (Ehrhart, 1979). Occasional nesting has been documented along the Gulf Coast of Florida, at Southwest Florida beaches, as well as the beaches of the Eglin Air Force Base on the Florida Panhandle (Meylan *et al., 1995*). Most documented green turtle nesting activity occurs on Florida index beaches, which were established to standardize data collection methods and effort on key nesting beaches. The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the six years of regular monitoring since establishment of the index beaches in 1989 and for which data have been published, perhaps due to increased protective legislation throughout the Caribbean (Meylan *et al.*, 1995).

While nesting activity is obviously important in identifying population trends and distribution, the major portion of a green turtle's life is spent on the foraging grounds. Green turtles are herbivores, and appear to prefer marine grasses and algae in shallow bays, lagoons and reefs (Rebel, 1974). Some of the principal feeding pastures in the Gulf of Mexico include inshore south Texas waters, the upper west coast of Florida and the northwestern coast of the Yucatan Peninsula. Additional important foraging areas in the western Atlantic include the Indian River Lagoon System in Florida, Florida Bay, the Culebra archipelago and other Puerto Rico coastal waters, the south coast of Cuba, the Mosquito coast of Nicaragua, the Caribbean coast of Panama, and scattered areas along Colombia and Brazil (Hirth, 1971). The preferred food sources in these areas are *Cymodocea, Thalassia, Zostera, Sagittaria, and Vallisneria* (Babcock 1937; Underwood, 1951; Carr, 1952; 1954).

Green turtles were once abundant enough in the shallow bays and lagoons of the Gulf to support a commercial fishery, which landed over one million pounds of green turtle in 1890 (Doughty, 1984). Doughty (1984) reported the decline in the turtle fishery throughout the Gulf of Mexico by 1902. Currently, green turtles are uncommon in offshore waters of the northern Gulf, but abundant in some inshore embayments. Shaver (1994) live-captured a number of green turtles in channels entering into Laguna Madre, in South Texas. She noted the abundance of green turtle strandings in Laguna Madre inshore waters and opined that the turtles may establish residency in the inshore foraging habitats as juveniles. Algae along the jetties at entrances to the inshore waters of South Texas was thought to be important to green turtles associated with a radio-telemetry project (Renaud *et al.*, 1995). Transmitter-equipped turtles remained near jetties for most of the tracking period. This project was restricted to late summer months, and therefore may reflect seasonal influences. Coyne (1994) observed increased movements of green turtles during warm water months.

Hawksbill turtle (*Eretmochelys imbricata*)

The hawksbill turtle is relatively uncommon in the waters of the continental United States, preferring coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges but also consume bryozoans, coelenterates, and mollusks. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills on the reefs of south Florida, and a surprising number of small hawksbills are encountered in Texas. Most of the Texas records are probably in the 1-2 year class range. Many of the individuals captured or stranded are unhealthy or injured (Hildebrand, 1983). The lack of sponge-covered reefs and the cold winters in the northern Gulf of Mexico probably prevent hawksbills from establishing a strong presence in this area.

Leatherback turtle (*Dermochelys coriacea*)

The Recovery Plan for Leatherback Turtles (*Dermochelys coriacea*) contains a description of the natural history and taxonomy of this species (USFWS and NMFS, 1992). Leatherbacks are widely distributed throughout the oceans of the world, and are found throughout waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour, 1972). Leatherbacks are predominantly distributed pelagically, feeding primarily on jellyfish such as *Stomolophus, Chryaora*, and *Aurelia* (Rebel, 1974). They may come into shallow waters if there is an abundance of jellyfish nearshore. Leary (1957) reported a large group of up to 100 leatherbacks just offshore of Port Aransas, Texas associated with a dense aggregation of *Stomolophus*.

The status of the leatherback population is the most difficult to assess since major nesting beaches occur over broad areas within tropical waters outside the United States. The primary leatherback nesting beaches occur in French Guiana and Suriname in the western Atlantic and in Mexico in the eastern Pacific. Although increased observer effort on some nesting beaches has resulted in increased reports of leatherback nesting, declines in nest abundance have been reported from the beaches of greatest nesting densities. At Mexiquillo, Michoacan, Mexico,

Sarti *et al.* (1996) reported an average annual decline in leatherback nesting of about 23% between 1984 and 1996. The total number of females nesting on the Pacific coast of Mexico during the 1995-1996 season was estimated at fewer than 1000. The major western Atlantic nesting area for leatherbacks is located in the Suriname-French Guiana trans-boundary region. Chevalier and Girondot (1998) report that combined nesting in the two countries has been declining since 1992. Some nesting occurs on Florida's east coast, although nests are likely under-reported because surveys are not conducted during the entire period that leatherbacks may nest. In the eastern Caribbean, nesting occurs primarily in the Dominican Republic, the Virgin Islands, and on islands near Puerto Rico. Sandy Point, on the western edge of St. Croix, Virgin Islands, has been designated by the U.S. Fish and Wildlife Service (USFWS) as critical habitat for nesting leatherback turtles. Anecdotal information suggests nesting has declined at Caribbean beaches over the last several decades (NMFS and USFWS, 1995).

Kemp's Ridley (*Lepidochelys kempii*)

Of the seven extant species of sea turtles of the world, the Kemp's ridley has declined to the lowest population level. The Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (FWS and NMFS, 1992b) contains a description of the natural history, taxonomy, and distribution of the Kemp's or Atlantic ridley turtle. Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico. Most of the population of adult females nest in this single locality (Pritchard, 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand, 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s. Recent observations of increased nesting, discussed below, suggest that the decline in the ridley population has stopped, and there is cautious optimism that the population is now increasing.

The nearshore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile Kemp's ridley and loggerhead sea turtles. Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. Stomach contents of Kemp's ridleys along the lower Texas coast had a predominance of nearshore crabs and mollusks, as well as fish, shrimp and other foods considered to be shrimp fishery discards (Shaver, 1991). Analyses of stomach contents from sea turtles stranded on upper Texas beaches apparently suggest similar nearshore foraging behavior (Plotkin, pers. comm.).

Research being conducted by Texas A&M University has resulted in the intentional live-captured of 100s of Kemp's ridleys at Sabine Pass and the entrance to Galveston Bay. Between 1989 and 1993, 50 of the Kemp's ridleys captured were tracked by biologists with the NMFS Galveston Laboratory using satellite and radio telemetry. The tracking study was designed to characterize sea turtle habitat and to identify small and large scale migration patterns. Preliminary analysis of the data collected during these studies suggests that subadult Kemp's ridleys stay in shallow,

warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud, NMFS Galveston Laboratory, pers. comm.).

In recent years, unprecedented numbers of Kemp's ridley carcasses have been reported from Texas and Louisiana beaches during periods of high levels of shrimping effort. NMFS established a team of population biologists, sea turtle scientists, and managers, known as the Expert Working Group (EWG) to conduct a status assessment of sea turtle populations. Analyses conducted by the group have indicated that the Kemp's ridley population is in the early stages of recovery; however, strandings in some years have increased at rates higher than the rate of increase in the Kemp's population (TEWG, 1998). While many of the stranded turtles observed in recent years in Texas and Louisiana are believed to have been incidentally taken in the shrimp fishery, other sources of mortality exist in these waters. These stranding events illustrate the vulnerability of Kemp's ridley and loggerhead turtles to the impacts of human activities in nearshore Gulf of Mexico waters.

TEWG 1998, developed a population model to evaluate trends in the Kemp's ridley population through the application of empirical data and life history parameter estimates chosen by the EWG. Model results identified three trends in benthic immature Kemp's ridleys. Benthic immatures are those turtles that are not yet reproductively mature but have recruited to feed in the nearshore benthic environment, where they are available to nearshore mortality sources that often result in strandings. Benthic immature ridleys are estimated to be 2-9 years of age and 20-60 cm in length. Increased production of hatchlings from the nesting beach beginning in 1966 resulted in an increase in benthic ridleys that leveled off in the late 1970s. A second period of increase followed by leveling occurred between 1978 and 1989 as hatchling production was further enhanced by the cooperative program between the U.S. Fish and Wildlife Service (FWS) and Mexico's Instituto Nacional de Pesca to increase the nest protection and relocation program in 1978. A third period of steady increase, which has not leveled off to date, has occurred since 1990 and appears to be due to the greatly increased hatchling production and an apparent increase in survival rates of immature turtles beginning in 1990 due, in part, to the introduction of TEDs. Adult ridley numbers have now grown from a low of approximately 1,050 adults producing 702 nests in 1985, to greater than 3,000 adults producing 1940 nests in 1995 and about 3,800 nests in 1998.

TEWG 1998 was unable to estimate the total population size and current mortality rates for the Kemp's ridley population. However, TEWG 1998 listed a number of preliminary conclusions. The TEWG 1998 report indicated that the Kemp's ridley population appears to be in the early stage of exponential expansion. Over the period 1987 to 1995, the rate of increase in the annual number of nests accelerated in a trend that would continue with enhanced hatchling production and the use of TEDs. Nesting data indicated that the number of adults declined from a population that produced 6,000 nests in 1966 to a population that produced 924 nests in 1978 and a low of 702 nests in 1985. This the trajectory of adult abundance tracks trends in nest abundance from an estimate of 9,600 in 1966 to 1,050 in 1985. TEWG 1998 estimated that in 1995 there were 3,000 adult ridleys. The increased recruitment of new adults is illustrated in the

proportion of neophyte, or first time nesters, which has increased from 6% to 28% from 1981 to 1989 and from 23% to 41% from 1990 to 1994. The population model, in TEWG 1998 projected that Kemp's ridleys could reach the intermediate recovery goal identified in the Recovery Plan, of 10,000 nesters by the year 2020 if the assumptions of age to sexual maturity and age specific survivorship rates plugged into their model are correct. It determined that the data reviewed suggested that adult Kemp's ridley turtles were restricted somewhat to the Gulf of Mexico in shallow near shore waters, and benthic immature turtles of 20-60 cm straight line carapace length are found in nearshore coastal waters including estuaries of the Gulf of Mexico and the Atlantic.

TEWG 1998 identified an average Kemp's ridley population growth rate of 13% per year between 1991 and 1995. Total nest numbers have continued to increase. However, the 1996 and 1997 nest numbers reflected a slower rate of growth, while the increase in the 1998 nesting level has been much higher. The population growth rate does not appear as steady as originally forecasted by the EWG, but annual fluctuations, due in part to irregular internesting periods, are normal for other sea turtle populations.

The area surveyed for ridley nests in Mexico was expanded in 1990 due to destruction of the primary nesting beach by Hurricane Gilbert. TEWG 1998 assumed that the increased nesting observed particularly since 1990 was a true increase, rather than the result of expanded beach coverage. Because systematic surveys of the adjacent beaches were not conducted prior to 1990, there is no way to determine what proportion of the nesting increase documented since that time is due to the increased survey effort rather than an expanding ridley nesting range. As noted by TEWG 1998, trends in Kemp's ridley nesting even on the Rancho Nuevo beaches alone suggest that recovery of this population has begun but continued caution is necessary to ensure recovery and to meet the goals identified in the Kemp's Ridley Recovery Plan.

Loggerhead Sea Turtles (*Caretta caretta*)

The loggerhead is a highly migratory species and is found in waters around the globe. The threatened loggerhead is the most abundant species of sea turtle occurring in U.S. waters. The nearshore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile loggerheads. Studies conducted on loggerheads stranded on the lower Texas coast (south of Matagorda Island) have indicated that stranded individuals were feeding in nearshore waters shortly before their death (Plotkin *et al.*, 1993).

TEWG 1998 identified four nesting subpopulations of loggerheads in the western North Atlantic based on mitochondrial DNA evidence. These include: (1) the northern subpopulation producing approximately 6,200 nests/year from North Carolina to northeast Florida; (2) the south Florida subpopulation occurring from just north of Cape Canaveral on the east coast of Florida and extending up to Naples on the west coast and producing approximately 64,000 nests/year; (3) the Florida Panhandle subpopulation, producing approximately 450 nests/year; and (4) the Yucatan subpopulation occurring on the northern and eastern Yucatan Peninsula in Mexico and producing approximately 1,500-2,000 nests/year.

Genetic analyses of benthic immature loggerheads collected from Atlantic foraging grounds identify a mix of the east coast subpopulations that is disproportionate to the number of hatchlings produced in these nesting assemblages. Although the northern nesting subpopulation produces only approximately 9% of the loggerhead nests, loggerheads on foraging grounds from the Chesapeake Bay to Georgia are nearly equally divided in origin between the two subpopulations (Sears, 1994; Sears *et al.*, 1995; Norrgard, 1995). Of equal interest, 57% of the immature loggerheads sampled in the Mediterranean were from the south Florida subpopulation, while only 43% were from the local Mediterranean nesting beaches (Laurent *et al.*, 1993; Bowen, 1995). Genetic work has not yet been done on nesting or foraging loggerheads in the Gulf of Mexico.

TEWG 1998 considered nesting data collected from index nesting beaches to index the population size of loggerheads and to consider trends in the size of the population. TEWG 1998 constructed total estimates by considering a ratio between nesting data (and associated estimated number of adult females and therefore adults in nearshore waters), proportion of adults represented in the strandings, and in one method, aerial survey estimates. These two methods indicated that for the 1989-1995 period, there were averages of 224,321 or 234,355 benthic loggerheads, respectively. TEWG 1998 listed the methods and assumptions in their report, and suggested that these numbers are likely underestimates. Aerial survey results suggest that loggerheads in U.S. waters are distributed in the following proportions: 54% in the southeast U.S. Atlantic, 29% in the northeast U.S. Atlantic, 12% in the eastern Gulf of Mexico, and 5% in the western Gulf of Mexico.

TEWG 1998 considered long-term index nesting beach datasets when available to identify trends in the loggerhead population. Overall, TEWG 1998 determined that trends could be identified for two loggerhead subpopulations. The northern subpopulation appears to be stabilizing after a period of decline; the south Florida subpopulation appears to have shown significant increases over the last 25 years suggesting the population is recovering, although the trend could not be detected over the most recent seven years of nesting. An increase in the numbers of adult loggerheads has been reported in recent years in Florida waters without a concomitant increase in benthic immatures. These data may forecast limited recruitment to south Florida nesting beaches in the future. Since loggerheads take approximately 20-30 years to mature, the effects of decline in immature loggerheads might not be apparent on nesting beaches for decades. Therefore, TEWG 1998 cautions against considering trends in nesting too optimistically.

Briefly, TEWG 1998 made a number of conclusions regarding the loggerhead population. The report concluded that four distinct nesting populations exist based on genetic evidence, although separate management is not possible because of insufficient information on the in-water distribution of each subpopulation. The report concluded that the recovery goal of more than 12,800 nests for the northern subpopulation was not likely to be met. Currently, nests number about 6,200 and no perceptible increase has been documented. The recovery goal or "measurable increases" for the south Florida (south of Canaveral and including southwest Florida) appears to have been met, and this population appears to be stable or increasing. However, index nesting

surveys have been done for too short a time; therefore, it is difficult to evaluate trends throughout the region. Recovery rates for the entire subpopulation cannot be determined with certainty at this time. However, caution is warranted because, although nesting activity has been increasing, catches of benthic immature turtles at the St. Lucie Nuclear Power Plant intake canal, which acts as a passive turtle collector on Florida's east coast, have not been increasing. TEWG 1998 recommended establishing index nest surveys areas in the Gulf of Mexico to monitor those populations, which do not currently have recovery goals assigned to them.

Fish

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

Detailed information regarding the life history, abundance and distribution of Gulf sturgeon can be found in the Gulf Sturgeon Recovery/Management Plan (FWS and GSMFC, 1995). Gulf sturgeon were listed as threatened in 1991, and are under the joint jurisdiction of the Fish and Wildlife Service and NMFS. Historically, Gulf sturgeon occurred in most major rivers between the Mississippi and the Suwannee, and in marine waters from the Mississippi to Florida Bay. While little is known about the abundance of Gulf sturgeon through most of its range, estimates exist for the Suwannee and Apalachicola rivers. The FWS (1990, 1991, 1992 in FWS & GSMFC, 1995) reported an average of 115 individuals larger than 45 cm total length over-summering in the Apalachicola River below Jim Woodruff Lock and Dam. For the Suwannee River, population size estimates ranging from 2,250 to 3,300 individuals have been made (Carr and Rago, unpublished data in FWS & GSMFC, 1995).

There is sparse information available regarding the distribution of Gulf sturgeon in the marine environment. A few takes incidental to commercial and recreational fishing have been documented offshore of Louisiana, in the Mississippi Sound and Biloxi Bay, Pensacola Bay, Apalachicola Bay, Tampa Bay and Charlotte Harbor. Although biotelemetry studies geared toward identifying the movements of sturgeon once they have entered marine waters have been conducted, little information has been developed yet. Gulf sturgeon likely leave riverine waters in the late fall to early winter to forage in the marine or estuarine environment for benthic invertebrates over mud and sand bottoms and seagrass communities, and return to the rivers in the spring.

Directed and incidental take in fisheries and habitat loss have been identified as the major threats to the recovery of Gulf sturgeon.

Analysis of the Species Likely to be Affected

Of the above listed species occurring in the eastern Gulf of Mexico, NMFS believes that the five species of sea turtle are likely to be adversely affected by the proposed action. NMFS believes that the Gulf sturgeon and listed species of large whales are not likely to be adversely affected by the proposed action. Although the Gulf sturgeon's migratory habits are not well known, NMFS

believes it is unlikely that Gulf sturgeon will stray from mud and sand bottom marine foraging areas in the Gulf to enter the rocky bottomed intake canal of the CREC and be affected by the cooling water intake system. Studies conducted by CREC from 1980 to 1983, to determine the species of fish and invertebrates affected by the cooling water system, showed no evidence of Gulf sturgeon. Species of large whales are not likely to occur in the inshore shallow waters by the intake canal. The remainder of the analysis in this biological opinion will focus on the five species of sea turtles.

IV. Environmental Baseline

Status of the Species Within the Action Area

The five species of sea turtles that occur in the action area are all highly migratory. The offshore waters of the eastern Gulf may be used by these species as post-hatchling developmental habitat, foraging habitat, or migratory pathways. NMFS believes that no individual members of any of the species are likely to be year-round residents of the action area. Individual animals will make migrations into nearshore waters as well as other areas of the Gulf of Mexico, Caribbean Sea, and North Atlantic Ocean. Therefore, the range-wide status of the species, given in Section II above, most appropriately reflects the species status within the action area.

Factors Affecting the Species Within the Action Area

The offshore waters of the eastern Gulf of Mexico remain relatively free of human activities that impact listed species of sea turtles. The only Federal action in the action area impacting these species, whose effects have been previously considered in a biological opinion, is the pelagic fishery for swordfish, tuna, and shark. As discussed above, however, sea turtles are not strict residents of the action area and may be affected by human activities throughout their migratory range. Therefore, this section will discuss the impacts of Federal actions on sea turtles throughout the Gulf of Mexico and western North Atlantic.

Federally-regulated commercial fishing operations represent the major human source of sea turtle injury and mortality in U.S. waters. Shrimp trawlers in the southeastern U.S. are required to use TEDs, which reduce a trawler's capture rate of sea turtles by 97%. Even so, NMFS estimated that 4,100 turtles may be captured annually by shrimp trawling, including 650 leatherbacks that cannot be released through TEDs, 1,700 turtles taken in try nets, and 1,750 turtles that fail to escape through the TED (NMFS, 1998). Henwood and Stuntz (1987) reported that the mortality rate for trawl-caught turtles ranged between 21% and 38%, although Magnuson *et al.* (1990) suggested Henwood and Stuntz's estimates were very conservative and likely an underestimate of the true mortality rate. The mid-Atlantic and Northeast fishery for summer flounder, scup, and black sea bass uses otter trawl gear that also captures turtles. Summer flounder trawlers fishing south of Cape Henry, Virginia (south of Oregon Inlet, North Carolina from January 15 to March 15) are required to use TEDs. Participants in this fishery who use a type of trawl known as a flynet, however, are not required to use TEDs, as TEDs for flynets have not been researched

and NMFS is collecting further observer information on turtle bycatch by flynet vessels. The estimated, observed annual take rates for turtles in this multispecies fishery is 15 loggerheads and 3 leatherbacks, hawksbills, greens, or Kemp's ridley, in combination (NMFS, 1996a). The pelagic fishery for swordfish, tuna, and shark, which is prosecuted over large areas of the northwestern Atlantic and the Gulf of Mexico, including the action area, also has a fairly large bycatch of sea turtles. NMFS (1997b) estimated that the longline component of this fishery would annually take, through hooking or entanglement, 690 leatherbacks, 1,541 loggerheads, 46 green, and 23 Kemp's ridley turtles, with a projected mortality rate of 30%. In the driftnet component of the fishery, estimated annual levels of injury or mortality are 40 leatherbacks, 58 loggerheads, 4 Kemp's ridleys, 4 greens, and 2 hawksbills.

Military activities, including vessel operations and ordnance detonation, also affect listed species of sea turtles. U.S. Navy aerial bombing training in the ocean off the southeast U.S. coast, involving drops of live ordnance (500 and 1,000-lb bombs) is estimated to injure or kill, annually, 84 loggerheads, 12 leatherbacks, and 12 greens or Kemp's ridley, in combination (NMFS, 1997a). The U.S. Navy will also conduct ship-shock testing for the new SEAWOLF submarine off the Atlantic coast of Florida, using 5 submerged detonations of 10,000 lb explosive charges. This testing is estimated to injure or kill 50 loggerheads, 6 leatherbacks, and 4 hawksbills, greens, or Kemp's ridleys, in combination (NMFS, 1996b). The U.S. Coast Guard's operation of their boats and cutters, meanwhile, is estimated to take no more than one individual turtle – of any species – per year (NMFS, 1995). Formal consultation on Coast Guard or Navy activities in the Gulf of Mexico has not been conducted.

The construction and maintenance of Federal navigation channels has also been identified as a source of turtle mortality. Hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move relatively rapidly and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. Along the Atlantic Coast of the southeastern United States, NMFS estimates that annual, observed injury or mortality of sea turtles from hopper dredging may reach 35 loggerheads, 7 greens, 7 Kemp's ridleys, and 2 hawksbills (NMFS, 1997c). Along the north and west coasts of the Gulf of Mexico, channel maintenance dredging using a hopper dredge may injure or kill 30 loggerhead, 8 green, 14 Kemp's ridley, and 2 hawksbill sea turtles annually (NMFS, 1997d).

Sea turtles entering coastal or inshore areas have been affected by entrainment in the cooling-water systems of electrical generating plants. At the St. Lucie nuclear power plant at Hutchinson Island, Florida, large numbers of green and loggerhead turtles have been captured in the seawater intake canal in the past several years. Annual capture levels from 1994-1997 have ranged from almost 200 to almost 700 green turtles and from about 150 to over 350 loggerheads. Almost all of the turtles are caught and released alive; NMFS estimates the survival rate at 98.5% or greater (1997e). Other power plants in south Florida, west Florida, and North Carolina have also reported low levels of sea turtle entrainment, but formal consultation on these plants' operations has not been completed.

Sea turtles are vulnerable to blast injury and death from the use of underwater explosives. Klima *et al.* (1988) reported a dramatic elevation in the number of sea turtle strandings along the north Texas coast, coinciding with a large number of explosive removals of offshore oil platforms in the area. Since then, protective measures implemented by NMFS, the Corps of Engineers, and the Minerals Management Service, including required observers at explosive rig-removals, have been effective in minimizing the impacts of explosive rig-removals on sea turtles. From 1987 to 1997, a total of 1,013 platform removals took place with NMFS observers present. Sea turtles were observed at 112 of those sites, and two loggerhead turtles were recovered injured after blasting. Those animals were rehabilitated and released. In 1998, one loggerhead was killed as a result of rig-removal blasting. Although some mortality may occur and go undetected, the overall number of turtles impacted by rig-removal actions has been very low since the adoption of protective measures.

Throughout the coastal Gulf of Mexico, but particularly in Louisiana, the loss of thousands of acres of wetlands is occurring due to natural subsidence and erosion, as well as reduced sediment input from the Mississippi River. Impacts caused by residential, commercial, and agricultural developments appear to be the primary causes of wetland loss in Texas.

Oil spills from tankers transporting foreign oil, as well as the illegal discharge of oil and tar from vessels discharging bilge water will continue to affect water quality in the Gulf of Mexico. Cumulatively, these sources and natural oil seepage contribute most of the oil discharged into the Gulf of Mexico. Floating tar sampled during the 1970s, when bilge discharge was still legal, concluded that up to 60% of the pelagic tars sampled did not originate from the northern Gulf of Mexico coast.

Marine debris will likely persist in the action area in spite of MARPOL prohibitions. In Texas and Florida, approximately half of the stranded turtles examined have ingested marine debris (Plotkin and Amos, 1990 and Bolten and Bjorndal, 1991). Although fewer individuals are affected, entanglement in marine debris may contribute more frequently to the death of sea turtles.

Coastal runoff and river discharges carry large volumes of petrochemical and other contaminants from agricultural activities, cities and industries into the Gulf of Mexico. The coastal waters of the Gulf of Mexico have more sites with high contaminant concentrations than other areas of the coastal United States, due to the large number of waste discharge point sources. Although these contaminant concentrations do not likely affect the more pelagic waters of the action area, the species of turtles analyzed in this biological opinion travel between nearshore and offshore habitats and may be exposed to and accumulate these contaminants during their life cycles.

In a study conducted by the NMFS Galveston Laboratory between 1993 through 1995, 170 ridleys were reported associated with recreational hook-and-line gear; including 18 dead stranded turtles, 51 rehabilitated turtles, 5 that died during rehabilitation, and 96 that were released by fishermen (Cannon and Flanagan, 1996). The Sea Turtle Stranding and Salvage Network

(STSSN) also receives stranding reports that identify carcass anomalies that may be associated with the recreational fishery (entangled in line or net, fish line protruding, fish hook in mouth or digestive tract, fish line in digestive tract). The reports do not distinguish between commercial or recreational sources of gear, such as hook, net, and line, which may be used in both sectors. Cumulatively, fishery entanglement anomalies are noted in fewer than 4% of the stranded sea turtle carcasses reported between 1990 and 1996, and some carcasses carry more than one anomaly (e.g., fishing line in digestive tract/fishing line protruding from mouth or cloaca), therefore summing these reports may result in some double counting.

In summary, several factors are currently affecting species of sea turtles within the action area:

- federally regulated commercial fishing operations continue to cause significant injury and mortality of sea turtles in US waters;
- military activities which involve vessel operations and ordnance detonation continue to injure or kill sea turtles;
- construction and maintenance of Federal navigation channels has, and will likely continue to be a significant source of sea turtle mortality;
- sea turtles continue to be entrained by cooling-water systems of electrical generating plants; and
- activities controlled by state or local government or private entities that cause or control the reduction of wetlands, increased marine debris, recreational activities on the water, polluted runoff, and oil spills.

These activities have combine to slow the recovery of species of sea turtles protected by the ESA, throughout their range

V. Effects of the Action

Since units 1, 2, and 3 began commercial operation, marine turtles have occasionally been found in the intake canal. CREC records indicate that from 1994 to 1997, eight sea turtles were stranded on the unit 3 intake bar racks. CREC records for these years were opportunistic, and do not indicate species, time of year, size or disposition of the stranded turtles (dead or alive). Sea turtle monitoring activities at CREC have increased substantially since 1997 with the monitoring program implemented in March of 1998 and the implementation of the Sea Turtle Rescue Guidelines dated Sept 1998. The increased monitoring should provide a more realistic estimate of the number of sea turtles stranded or killed each year at the plants.

The number of sea turtle sightings in the intake canal and strandings on the bar racks increased dramatically in 1998. The majority of these were Kemp's ridley sea turtles. In February 1998, 2

sea turtles were found stranded on the bar racks. These turtles were released alive. During March 1998 an additional 19 turtles were stranded on the unit 3 bar rack and released alive. Four mortalities were discovered floating in the intake canal. CREC considers these four mortalities not causally related to plant operations since they were found upstream of the power plant intake structures. CREC considers it highly unlikely that a turtle mortality related to power plant operations could float against the incoming water current and by pass the surface trash boom structures.

In April, 1998 an additional 14 stranded sea turtles were released alive and 7 mortalities found. Four of these mortalities were found on the bar racks while the other 3 were found floating upstream of the intake structure. For the reasons described above CREC does not consider these three mortalities to be caused by plant operations. In May, 1998 a total of 4 sea turtles were stranded on the bar racks at unit 3 and released, 2 mortalities were recovered, one at unit 3 and the other was seen floating in the canal and finally recovered near the intakes for units 1 and 2. This mortality had evidence of a boat collision. During June and July no sea turtles were stranded at CREC. During August 1998, one live sub-adult green turtle was removed from the bar racks of units 1 and 2. This turtle was considered severely debilitated by fibropapillomatosis and was transferred, under the direction of the Florida Department of Environmental Protection (FDEP), to the Clearwater Marine Science Center for rehabilitation.

NMFS agrees with the BA that dead turtles floating in the canal are not causally related to plant operations for the reasons stated above. NMFS also believes that severely decomposed turtles found on the bar racks are also not causally related to plant operations as the bar racks are continually monitored on a daily basis for turtle strandings. Therefore dead sea turtles not considered causally related to plant operations and verified by the FDEP are not considered as lethally taken by CREC.

The records indicate that this activity has not taken many sea turtles for years up to 1998. For the four years from 1994 to 1997 the activities at CREC have taken an average of two sea turtles per year. Records for 1998 show a dramatic increase in the numbers of sea turtle strandings at CREC, especially for the months of February to May. In 1998 a total of 40 takes were stranded at the power plants, 5 being lethal. Of these, 37 of the turtles released alive were Kemp's ridley and all 5 lethal takes were also Kemp's ridley. All sea turtles stranded at CREC were sub-adults with carapace lengths ranging from 21 cm to 55 cm. There are no proven environmental factors that have caused this increase and population numbers are not monitored for this area so the increase could be from an increase in population or an increase in sub-adult turtles moving into this area from some other area (personal communication with Allen Foley, FDEP). According to CREC personnel there has been 4 Kemp's ridley sub-adult turtles released alive from the bar racks at unit 3, from January to March of 1999 (personal communication with David Bruzek, CREC). Thus far this rate of take is less than this time in 1998, and is considered comparable to other years excluding 1998.

Based on this information, and the fact that another anomalous year such as 1998 is possible, NMFS believes that the level of live take of sea turtles in BSEP's intake canal may reach 50 sea turtles rescued alive from the bar racks biannually and 5 lethal takes, biennially that are causally related to plant operations. NMFS does not believe that this level of lethal take is likely to appreciably reduce the likelihood of survival and recovery of the species.

VI. Cumulative Effects

Cumulative effects are the effects of future state, local, or private activities that are reasonably certain to occur within the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Within the action area, major future developments in human activities, that are not part of a Federal action, are not anticipated. Because the action area is entirely within the Exclusive Economic Zone, new activities such as natural resource extraction/harvest would be subject to Federal review and/or regulation. As discussed in Section III, however, listed species of turtles migrate throughout the Gulf of Mexico and may be affected during their life cycles by non-Federal activities outside the action area. The state, local, and other non-federally regulated activities listed in the Environmental Baseline section of this BO, such as wetland loss, contaminated runoff, marine debris, and oil spills are expected to persist into the future and will continue to slow the recovery of sea turtles.

State-regulated commercial and recreational fishing activities in the Gulf of Mexico waters take endangered species. These takes are not reported and are unauthorized. It is expected that states will continue to license/permit large vessel and thrill-craft operations which do not fall under the purview of a Federal agency and will issue regulations that will affect fishery activities. NMFS will continue to work with states to develop ESA Section 6 agreements and Section 10 permits to enhance programs to quantify and mitigate these takes. Increased recreational vessel activity in inshore waters of the Gulf of Mexico will likely increase the number of turtles taken by injury or mortality in vessel collisions. Recreational hook-and-line fisheries have been known to lethally take sea turtles, including Kemp's ridleys. Continued cooperation between NMFS and the states on these issues should help decrease take of sea turtles caused by recreational activities.

VII. Conclusion

After reviewing the current status of the affected species of sea turtles, the environmental baseline for the action area, and the effects of the action, it is NMFS's biological opinion that the operation of the cooling water intake system of the Crystal River Energy Complex as outlined in the Nuclear Regulatory Commission's Biological Assessment, dated October 14, 1998, is not likely to jeopardize the continued existence of the loggerhead, leatherback, green, hawksbill, or Kemp's ridley sea turtles. No critical habitat has been designated for these species in the action area, therefore none will be affected.

VIII. Incidental Take Statement

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the reasonable and prudent measures and terms and conditions of the Incidental Take Statement.

The measured described below are non-discretionary, and must be undertaken by the NRC so that they become binding conditions on the operations of the Crystal River Energy Complex, as appropriate, for the exemption in section 7(o)(2) to apply. The NRC has a continuing duty to regulate the activity covered by this incidental take statement. If the NRC (1) fails to assume and implement the terms and conditions or (2) fails to require the Crystal River Energy Complex to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of the incidental take the NRC and the Crystal River Energy Complex must report the progress of the action and its impact on the species to NMFS as specified in the incidental take statement [50 CFR 402.14(i)(3)].

Amount of Take

NMFS has estimated the impact of CREC's operation of its cooling water intake system on listed species of sea turtles (see Assessment of Impacts above). Based on this analysis, NMFS anticipates 50 live takes due to the rescue of sea turtles from the bar racks (of the five species analyzed in this BO), 5 lethal takes (lethal take being turtle mortalities considered causally related to plant operations and verified by the FDEP) and 8 dead turtles not causally related to plant operations could be incidentally taken every two years (annual records are from January 1-December 31 each year), as a result of this action.

Effect of the Take

In the accompanying BO, NMFS determined that this level of anticipated take is not likely to result in jeopardy to the Kemp's ridley, green, loggerhead, leatherback, and hawksbill sea turtles.

Reasonable and Prudent Measures

NMFS believes the following reasonable a prudent measures are necessary and appropriate to minimize impacts of incidental take of the Kemp's ridley, green, loggerhead, leatherback, and hawksbill sea turtles:

1. CREC will monitor sea turtle activities around the bar racks and rescue sea turtles stranded on the bar racks.

2. CREC will keep records of sea turtle strandings at the plants.

These measures are required to decrease the number of lethal takes caused by plant operations. The implementation of a plan to monitor the cooling water intake structures and to rescue sea turtles stranded on them before they are killed will reduce the number of lethal takes.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the NRC must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary.

1. Continue implementation of the procedures outlined in the Sea Turtle Rescue and Handling Guidelines for CREC dated September 9, 1998. All updates of the rescue plan will be reviewed by the FDEP and NMFS.

2. If any listed species are apparently injured or killed in the intake canal or the bar racks, a report, summarizing the incident, must be provided to the NMFS Southeast Regional Office's (SERO) Assistant Regional Administrator, Protected Resources Division, within 30 days of the incident.

3. All sea turtle takings at the plant will be recorded by species, size and time of year taken. These records will be made available to the SERO Assistant Regional Administrator, Protected Resources Division, 30 days after the start of each year or upon written request during other parts of the year. If non lethal take reaches 40 individuals, causally related lethal take reaches 3 individuals or if take of non causally related dead turtles reaches 6 individuals, CREC will notify the SERO Assistant Regional Administrator, Protected Resources Division within 5 days. After these levels of take are reached any subsequent take must be reported to the SERO Assistant Regional Administrator, Protected Resources Division within 24 hours of the take. Final disposition of all sea turtles taken at the plant (live, lethal, or non causally related lethal) shall be in accordance with the Sea Turtle Rescue and Handling Guidelines for CREC dated September 9, 1998.

NMFS believes that no more than 63 sea turtles will be incidentally taken every two years as a result of the proposed action. Thirteen of these takes will be lethal including 8 that are non-causally related to plant operations. The reasonable and prudent measures and their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of this action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation

of consultation and review of the reasonable and prudent measures provided. The NRC must immediately provide an explanation of the causes of the taking and review with NMFS the need for possible modification of the reasonable and prudent measures.

IX. Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorizations to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. CREC should set up a tagging program for released sea turtles in conjunction with FDEP.

2. CREC should continue the evaluation and experimentation on methods to be employed that could be used to keep sea turtles away from the bar racks.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, NMFS requests notification of the implementation of any conservation recommendations.

X. Reinitiation of Consultation

This concludes formal consultation on the actions outlined in the NRC's BA dated October 14, 1998. As provided in 50 CFR 402.16 reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) an if (1) the amount or extent of taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat (when designated) in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, the NRC and CREC must immediately request reinitiation of formal consultation.

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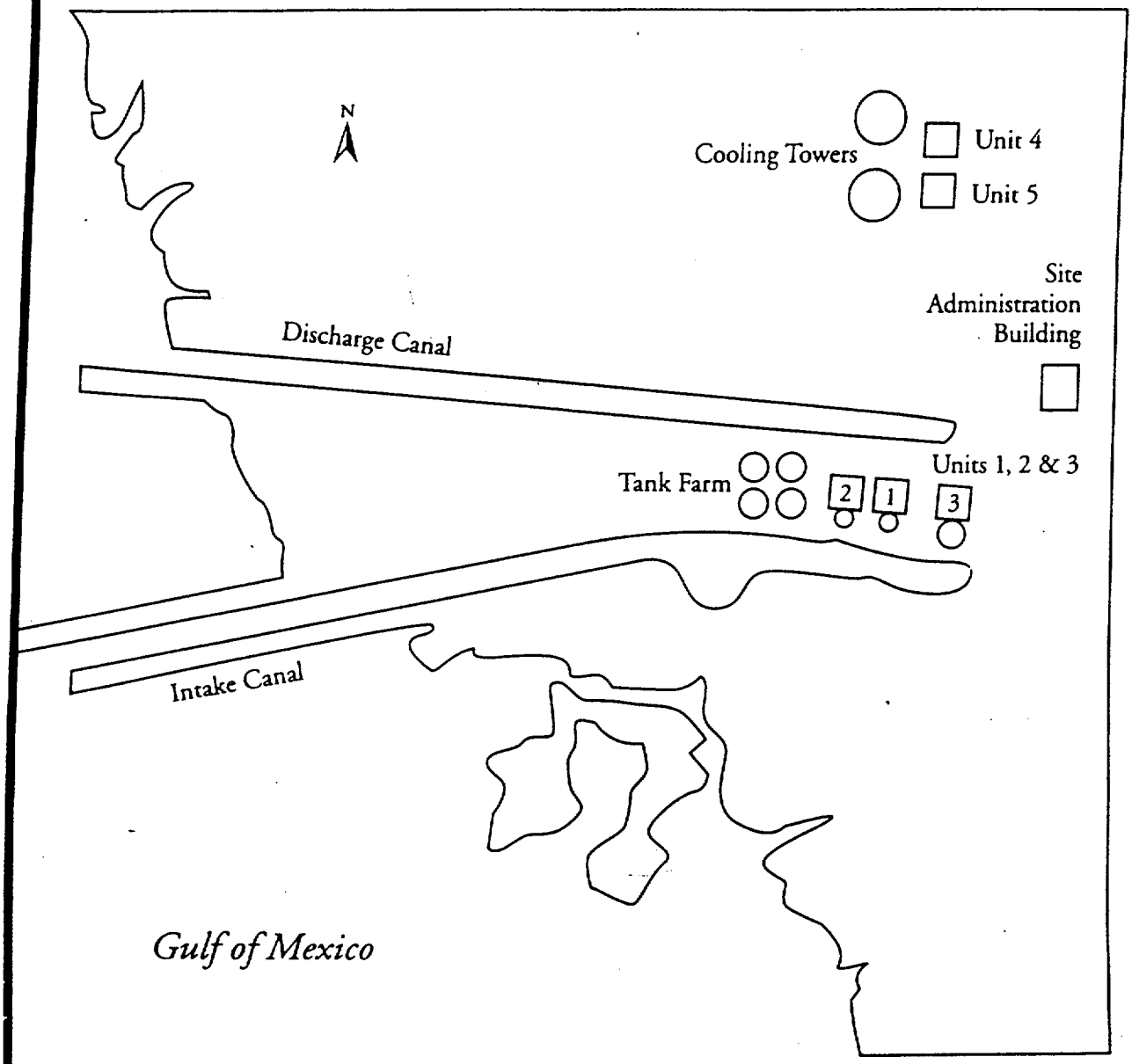
ATTACHMENT 1



Site layout of the Crystal River Energy Complex.

Mr. John Paul Cowan
Florida Power Corporation

cc:
Mr. R. Alexander Glenn
Corporate Counsel (MAC-BT15A)
Florida Power Corporation
P.O. Box 14042
St. Petersburg, Florida 33733-4042

Mr. Charles G. Pardee, Director
Nuclear Plant Operations (PA4A)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. Michael A. Schoppman
Framatome Technologies Inc.
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circle, SE, Bin #C21
Tallahassee, Florida 32399-1741

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Chairman
Board of County Commissioners
Citrus County
110 North Apopka Avenue
Inverness, Florida 34450-4245

Ms. Sherry L. Bernhoft, Director
Nuclear Regulatory Affairs (NA2H)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Senior Resident Inspector
Crystal River Unit 3
U.S. Nuclear Regulatory Commission
6745 N. Tallahassee Road
Crystal River, Florida 34428

Mr. Gregory H. Halnon
Director, Quality Programs (SA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Sea Turtle Meeting Agenda

May 13, 1998

NRC / NMFS / FMRI / FPC

- Welcome, Meeting Objectives
- Review of Plant Layout/Systems
- Major Events & Actions Taken
- Site Visit To Intake Basin
- Next Steps - FPC
- Feedback from NRC/NMFS/FMRI
- Tour of Mariculture Center

A/4

Attendee List/Affiliation

NRC

Len Wiens, Project Manager
Claudia Craig
M. Malloy
Steve ~~Cahill, Senior~~ Sanchez Resident Inspector

NMFS

Colleen Coogan, Fisheries Biologist

FDEP / FMRI

Allen Foley, Assistant Research Scientist

Florida Power Corporation

Corporate Offices *- communicates with NMFS and FDEP/FMRI*

Jeff Pardue, Director Environmental Services Department
Dave Bruzek, Manager, Mariculture Center
Alex Glenn, Corporate Counsel
Ed Vilade, Corporate Communications

Crystal River Nuclear Plant *- communicates with NRC*

Sherry Bernhoft, Manager, Nuclear Licensing
Steve Garry, Supervisor, Environmental and Radiological Compliance
Jim Terry, Manager, Engineering

Crystal River Fossil Plant *- communicates with FPC Corporate and CR-3*

Mark Aarestad, Project Manager - Environmental, Units 1 & 2
Dick Laxton, Superintendent, Site Support

OBJECTIVES

- Provide all interested parties with a common understanding of the events and actions
- Forum for information exchange
- Discuss options, establish course of action for continued operations

Plant Layout

- 8 mile canal
- 21 foot depth
- land boundary at 4 miles
- intake structures

1.3 MGPM btwn U1,2,3 flow thru intake

1.3 fps flow thru intake canal

Historical Background

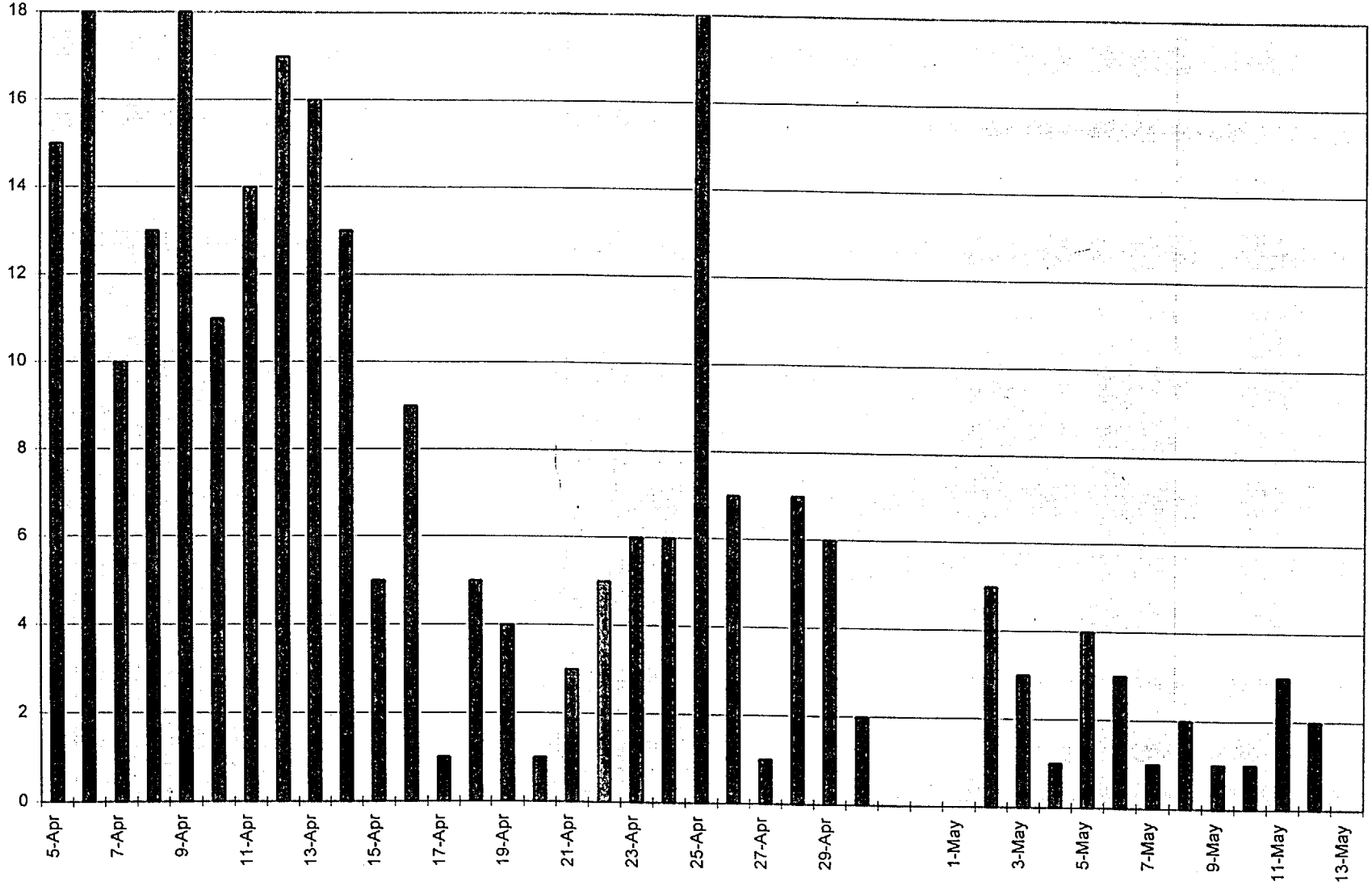
- Kemp's Ridley sea turtles are known to inhabit the area
- Historically, CR-3 has seen only a few Kemp's Ridleys

Recent Experience

- March 1998, in flux began
- May 1998, out flux observed
- (see chart, next page)

# of sightings has decreased

Turtle Sightings Chart



Contributing causal factors

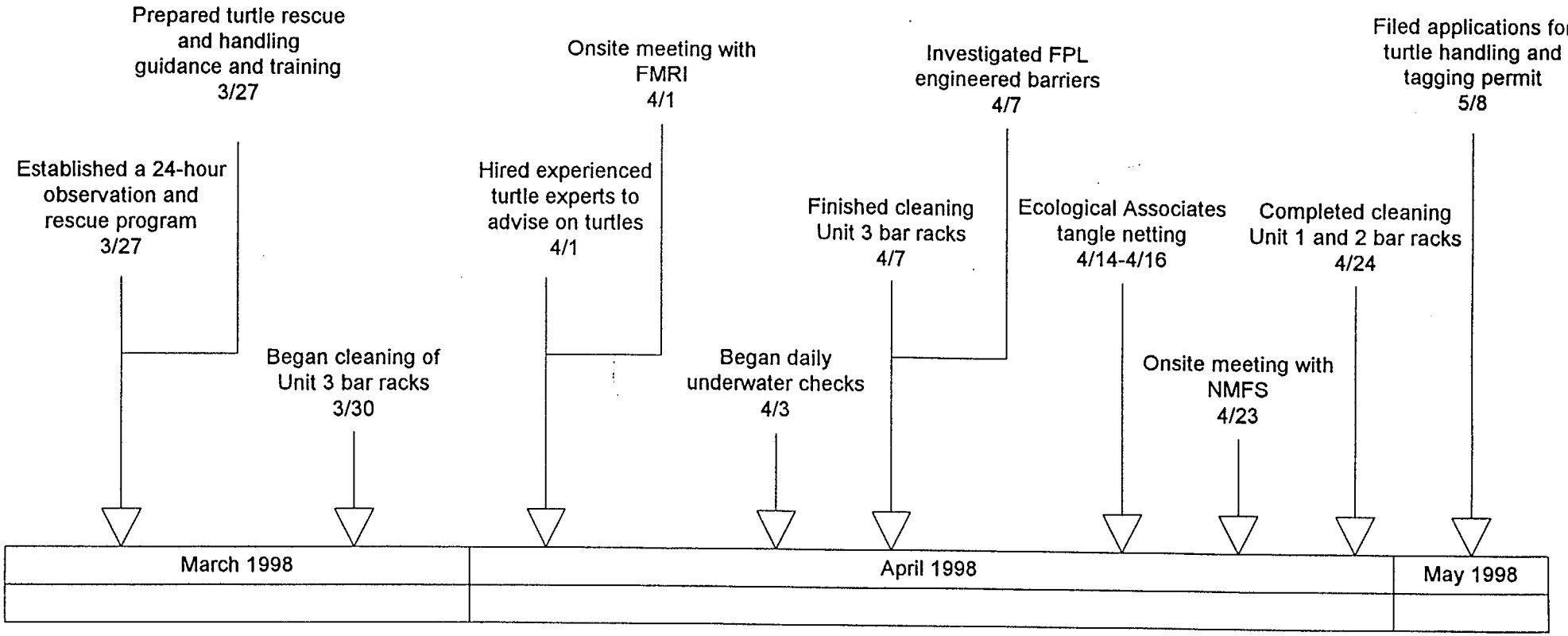
- no single known factor, may be related to:
  - sea turtle migratory changes,
  - changes in prey abundance,
  - lower salinity, or
  - water quality parameters.

more stranded (i.e. dead) turtles reported in area than ever before

How we responded

- see attached time line

Turtle Protective Action Timeline



Where we are

- Maintaining 24 hour watch while turtles are present
- hourly check of Units 1 and 2 bar racks
- daily underwater checks of bar racks

Turtle Watch Personnel

- trained by FPC Marine Biologist
- understand importance of their job

Turtle Rescue Procedure

- Review CR-3 Turtle Rescue/Handling Guidance Document

TOUR OF INTAKE AREA

Turtle Stranding & Tagging Permit

- Is being obtained
- Revise Rescue/Handling guidance accordingly
- Train staff on permit requirements

After out flux

- continue periodic monitoring
- anticipate return

Re-institute Protective Measures During Turtle In-Fluxes

Perform Bar Rack Cleaning

- to remove food source
- increase frequency of bar rack cleaning

Timing of bar rack cleaning

- adjust timing to reduce food attraction
- such as cleaning bar racks in January
- re-clean when needed

U1&2 to do the same, even though have to dive per ~$2590/unit when bar racks removed

Perform Biological Assessment

- beginning plans to perform study
- describes situation
- investigate event more fully
- document FPC's guidance

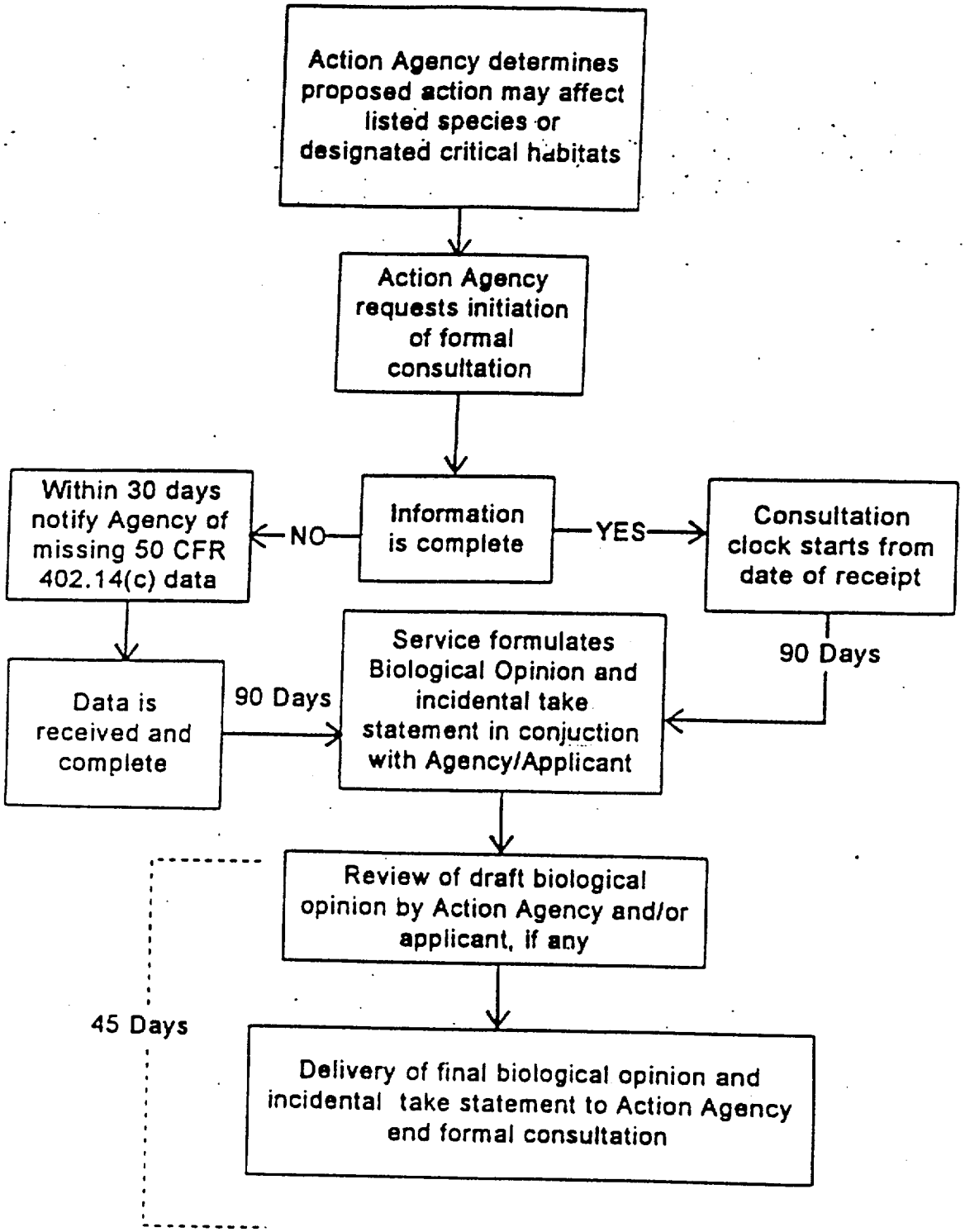
FPC Commitments

- obtain stranding & handling permits
- develop procedure guidance on observation and rescue protocols
- do bar rack cleaning as appropriate
- perform biological assessment

ENDANGERED SPECIES ACT SECTION 7(a)(2) INTERAGENCY COOPERATION

Requires every Federal agency, in consultation with NMFS and/or FWS, to insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species.

Formal consultation process.

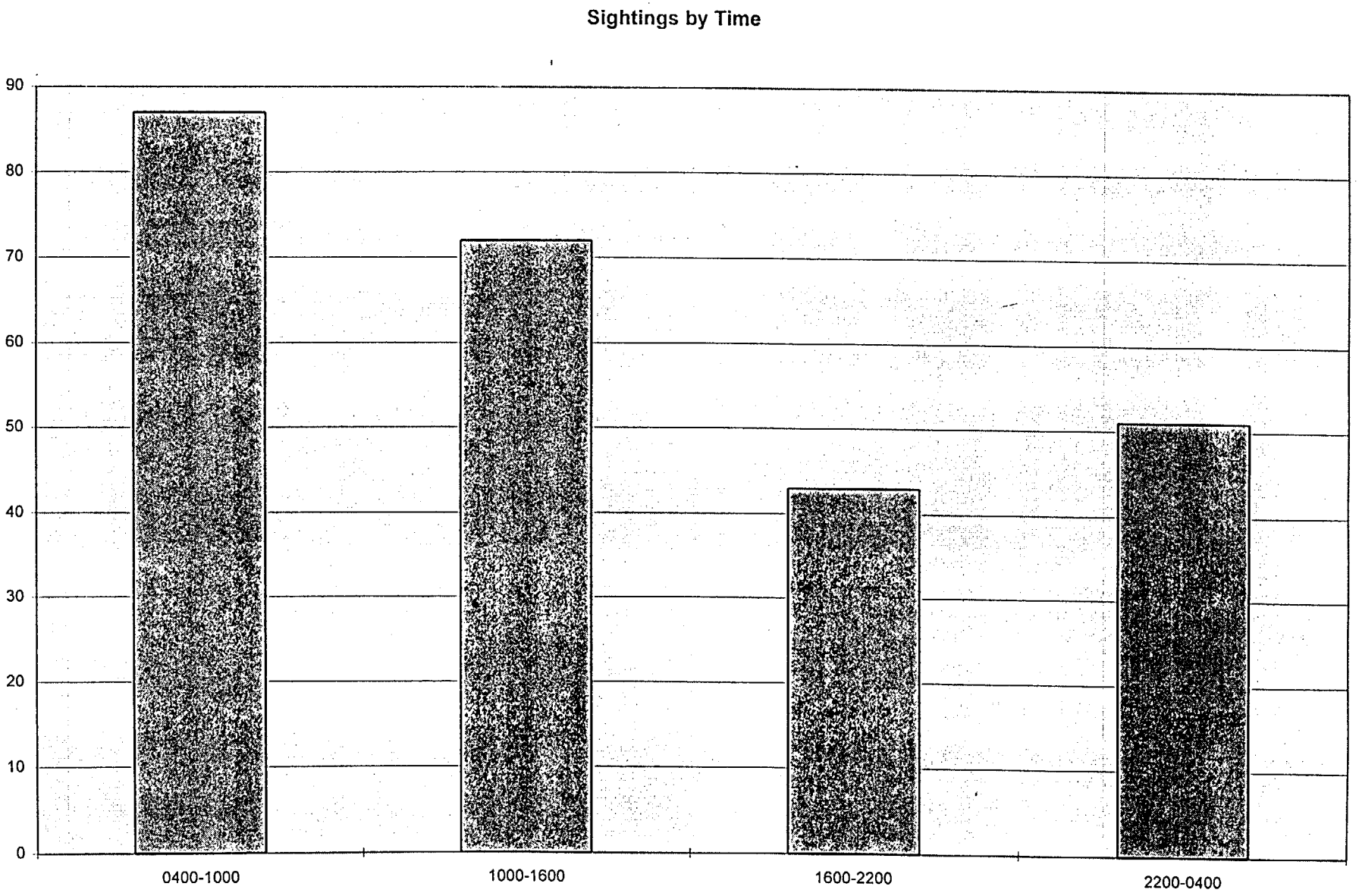


Incidental Take Statement

- Takings must not be likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat
- Takings must result from an otherwise lawful activity
- Takings must be incidental to the purpose of the action.

- Provides an exemption from ESA Section 9 take prohibitions when the action agency demonstrates compliance with terms and conditions that implement reasonable and prudent measures to minimize the impact of the incidental take on the species.

Sightings by Time Chart 4



SEA TURTLE RESCUE & HANDLING GUIDANCE

Interim Guidance pending receipt of FDEP Stranding Permit
CRYSTAL RIVER ENERGY COMPLEX
Revision 1

BACKGROUND

Sea turtles are graceful saltwater reptiles, well adapted to life in the marine environment. With streamlined bodies and flipper-like limbs, they are able to swim long distances in a relatively short time.

Sea turtles are air-breathing, and when they are active they must swim to the water surface every few minutes. Turtles have been observed swimming underwater for periods of up to 20 minutes, and when resting some have been observed to remain underwater for as long as 2 hours without breathing.

OBSERVATION and RESCUE

The Turtle Rescue personnel must monitor Sea Turtle activity in front of the bar racks so that any sea turtle in distress can be safely and efficiently moved to a safe area. The Turtle Rescue personnel should:

1) **OBSERVE** the intake basin and log turtle observations so that the presence/ absence of turtles is known.

2) **INSPECT** the CR-3 bar racks for the presence of any lodged or deceased sea turtles. The monitoring must be performed continuously during known turtle influxes and logged for 15 minutes intervals. Continuously is defined as a minimum of once every 15 minutes (but as constant as practical).

   Units 1 & 2 bar racks should be inspected hourly and logged accordingly.

3) **NOTIFY** the Security Dispatch Desk if a sea turtle is observed lodged on the bar racks. The Turtle Watch Rescue person will contact the Security Site Dispatch Desk, who in turn notifies the Security Captain. The Captain dispatches support personnel to the intake area to help the Turtle Watch Rescue. This is to ensure personnel safety and to provide rescue support. The Security support personnel shall keep the Site Security Dispatch Desk informed, who in turn shall keep the CR-3 Control Room informed during and after the rescue. The Control Room will likely dispatch an Operations person to support the rescue (provide manpower or operate equipment).

3) **RECOVER** the sea turtle **IMMEDIATELY** after notification of the Security Dispatch Desk. Use dip net or other equipment as appropriate to remove the sea turtle. Observe all safety procedures when working at the waterfront. Take all steps possible to minimize stress on the sea turtle.

Turtle Handling Guidance

Note: Turtles are to protected from harassment at all times.

CAUTION

Gloves should be worn at all times when handling sea turtles.

Sea Turtles have powerful crushing jaws. They will bite when handled and can cause significant bodily harm. Keep clear of the turtle's head whenever possible.

Sea turtles may have claws on their front flippers. Keep clear of the front flippers whenever possible.

Handle sea turtle with the nets provided. Only if necessary, handle the turtle by the front and back of the shell. Do not pick them up by the flippers, head, or tail.

- **DO NOT release any turtle.** Any sea turtle that has been lodged against the intake bar racks should be held for identification and evaluation:

- **Healthy turtles** should be immediately placed in the small tank at the intake basin which has been provided with enough sea water to allow the turtle to float (approximately 6-12 inches). Observe turtle to ensure that it is strong enough to lift its head to breathe.

  During regular business hours, the Security Site Dispatch Desk should contact Mariculture Center staff for pick-up.

  After hours, or if Mariculture Center staff is unavailable, the turtle should be carefully transported by Site support personnel to the holding tank at the Mariculture Center. Note: The Turtle Rescue personnel are not to abandon their observation post; i.e., this transport is provided by the Security support personnel.

- The Mariculture Center staff will check daily for turtles in the holding tank (including weekends. Therefore, notifications to Mariculture staff are **NOT** necessary for healthy turtles rescued after hours.

- **Sick, injured** or **weak** turtles should be placed on a wet towel. The turtle should be kept in a cool, quiet area out of direct sunlight. Do not place the turtle on any hot or abrasive surface.

  The Site Security Dispatch Desk should contact Mariculture Staff immediately to inform them of the distressed turtle (24 hours per day). Mariculture staff will respond immediately to provide support. Note: Call out Mariculture staff in order of listing on the call out list unless otherwise instructed.

Resuscitation

NOTE

Attempts should be made to resuscitate comatose sea turtles. Sea turtles can remain motionless and appear dead for up to several hours.

If turtles are recovered comatose, **ATTEMPT** resuscitation by:

a) **PLACING** turtle on its back and elevate hindquarters to help drain lungs.
b) **PUMPING** firmly but carefully on the bottom shell with a hand or foot.
c) **MAINTAINING** a pumping rate of approximately 30 times per minute.
c) **REPEATING** several times, monitoring turtle for signs of breathing.

If no results are achieved after several attempts:

d) **PLACE** the turtle on its belly
e) **ELEVATE** the hind quarters several inches
f) **MAINTAIN** the turtle in the shade on a wet towel
g) **ATTEND** to sea turtle until the Mariculture Center staff who are responding to the call out arrive and can perform advanced resuscitation techniques.

- **Dead** turtle:

If sea turtle can not be revived or is obviously dead, place dead turtles in a plastic tank with ice to prevent decomposition and retard odor. Site Security Dispatch Desk should notify Mariculture staff between 8:00 a.m. and 5 p.m., 7 days a week, to arrange for pick-up and disposal per FDEP instructions.

Follow-up Evaluations, Notifications and Documentation

- **Follow up Evaluations**:

- Mariculture staff will perform an identification and health evaluation for all rescued turtles. Following the evaluation, the FDEP will be contacted for instructions on whether to release the turtle to the Gulf of Mexico or to arrange for transportation to a rehabilitation facility. The Clearwater Marine Science Center is an authorized facility for the treatment of sick or injured turtles.

Off-Site Notifications

- FDEP and rehabilitation facility notifications will be made by the Mariculture staff. The Mariculture Center will be used as an interim facility to hold sea turtles prior to pick-up and treatment or disposal.

- The Security Dispatch Desk will log turtle events accordingly.

- The Control Room will make NRC notifications in accordance with CR-3 procedures.

- **DOCUMENTATION**

- The Turtle Watch Rescue should document:

  a) Time of incident.
  b) Position sea turtle was found.
  c) Activity level of sea turtle.
  d) Any injuries or other abnormal conditions of the sea turtle.
- e) Any other relevant information.

- The Security Dispatch Desk will collect and maintain data entry logs from the Turtle Watch Rescue.

- The Control Room will log turtle rescue and mortality events.

Florida Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

October 1, 1998
3F1098-10

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

Subject: Biological Assessment for Crystal River Unit 3 (TAC No. MA1706)

Dear Sir:

On May 13, 1998, members of the NRC staff, the Florida Department of Environmental Protection (FDEP), the National Marine Fisheries Service (NMFS), and Florida Power Corporation (FPC) met to discuss endangered species sea turtles. On July 17, 1998, the NRC requested FPC to prepare a biological assessment under the Endangered Species Act. The attached Biological Assessment is being submitted in accordance with that request. Additional copies of the Biological Assessment are being sent to the NRR Project Manager for his distribution.

The assessment concludes that protective measures implemented at the Crystal River Energy Complex have been successful in protecting sea turtles and that future plant operations represent no jeopardy to any sea turtle species. It is expected that the attached document will be reviewed by the NMFS under the Endangered Species Act consultation process. Subsequently, NMFS will likely issue an Incidental Take Statement. This statement will likely establish formal sea turtle protection requirements. Therefore, there are no regulatory commitments being made at this time, pending receipt of the Incidental Take Statement.

If you have any questions regarding this submittal, please contact Mr. Steven M. Garry, Supervisor, Environmental and Radiological Compliance at (352) 563-4777.

Sincerely,

Sherry L Bernhoft for

Robert E. Grazio
Director, Nuclear Regulatory Affairs

REG/smg
Attachment

xc: Regional Administrator, Region II
Senior Resident Inspector
NRR Project Manager

Biological Assessment of Impact to Sea Turtles at Florida Power Corporation's Crystal River Energy Complex

Prepared by
Florida Power Corporation

October 1, 1998

Table of Contents

SUMMARY

This biological assessment examines the impact of Florida Power Corporation's (FPC) Crystal River Energy Complex on five species of federally listed sea turtles. It has been prepared in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended. This biological assessment is being submitted to the Nuclear Regulatory Commission (NRC) to support an ESA Section 7 consultation with the National Marine Fisheries Service (NMFS) and the issuance of a biological opinion and Incidental Take Statement.

There are five species of sea turtles which are known to occur in the Gulf of Mexico. They are the green, loggerhead, leatherback, hawksbill, and Kemp's ridley turtles. Since the initial commercial operation of Crystal River Units 1, 2, and 3 (1966, 1969, and 1977, respectively), green, loggerhead and Kemp's ridley sea turtles have been occasionally observed in the vicinity of the power plant intake canal.

In early 1998, FPC observed a significant increase in the number of Kemp's ridley sea turtles stranded on the bar racks of the Crystal River power plants. As a result, FPC implemented extensive measures to protect the sea turtle population. These measures included: (1) A continuous, 24 hour per day, 7 day per week sea turtle watch; (2) Implementation of sea turtle rescue and handling guidelines; (3) Training of appropriate FPC personnel in basic sea turtle biology, handling, resuscitation, and care; (4) Expedited bar rack cleaning to reduce fouling growth and minimize water velocity across the racks; (5) Implementation of a pilot sea turtle entanglement net program; and (6) Acquisition of a marine turtle permit authorizing FPC personnel to perform sea turtle stranding and salvage activities.

FPC closely coordinated stranding activities with the Florida Department of Environmental Protection (FDEP) to ensure the proper care and treatment of each stranded sea turtle. Live, stranded sea turtles rescued from the intake bar racks were promptly examined by an FPC biologist and overall health was evaluated. At the direction of the FDEP, healthy turtles were returned to the Gulf of Mexico. Weak, injured or diseased turtles were transferred to the Clearwater Marine Science Station for rehabilitation, and sea turtle mortalities were transferred to the FDEP or the Clearwater Marine Science Station for necropsy or disposed in accordance with FDEP instructions.

The sea turtle protective measures implemented at the Crystal River Energy Complex have been effective and successful in protecting sea turtles. By utilizing these protective measures, the Crystal River Energy Complex will not jeopardize any sea turtle species. FPC requests that an Incidental Take Statement be issued which establishes protective measures for sea turtles while allowing incidental take. The annual lethal take related to power plant activity is expected to be limited to four Kemp's ridley and one each of green and loggerhead turtles. FPC can not accurately predict the level of annual lethal takes not related to power plant activity due to the variability and increasing numbers of state-wide sea turtle strandings.

INTRODUCTION

The purpose of this biological assessment is to determine the impact, if any, of the Crystal River Energy Complex on sea turtles that are protected under the Endangered Species Act (ESA) of 1973, as amended. The ESA is designed to conserve endangered and threatened species of fish, wildlife, and plants. Section 7 of the Act provides for cooperation among federal agencies to ensure that actions by the agencies do not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat of the species under consideration.

Sea turtles historically have had a minimal presence in the waters of the Crystal River Energy Complex intake canal. In early 1998, FPC observed a significant increase in the number of sea turtles present in the canal. The reasons for this sudden increase are not certain.

In response to this increased sea turtle presence, a meeting between FPC, NRC, NMFS and FDEP was held on May 13, 1998, to initiate consultation in accordance with the ESA. It was determined that the consultation will include the NRC, which is the licensing federal agency for Crystal River Unit 3; the NMFS, which has jurisdiction over sea turtles in waters of the United States; the United States Environmental Protection Agency (EPA), which is the federal agency administering the Crystal River Units 1, 2, and 3 National Pollutant Discharge Elimination System (NPDES) permit; and the FDEP, which has been delegated NPDES responsibilities and also coordinates marine turtle stranding activities in Florida.

This consultation does not involve the United States Fish and Wildlife Service, which has jurisdiction over sea turtles only when they venture onto land for nesting purposes and during egg incubation. The impact to sea turtles at the Crystal River Energy Complex does not involve nesting sea turtles.

SITE DESCRIPTION

Location

The Crystal River Energy Complex is located on an approximate 5,000 acre site near the Gulf of Mexico in Citrus County, Florida (Figure 1). The complex is approximately 7-½ miles northwest of the city of Crystal River, within the coastal salt marsh area of west central Florida.

Crystal River Energy Complex

The Crystal River Energy Complex contains five separate power plants (Figure 2). Unit 1 is an approximately 400 MW electric (MWe) coal-fueled plant, which began commercial operation in October 1966. Unit 2 is an approximately 500 MWe coal-fueled plant, which began commercial operation in November 1969. Unit 3 is an approximately 890 MWe pressurized water, nuclear-fueled plant, which began commercial operation in March 1977. Units 4 and 5 are two coal-fueled plants at approximately 640 MWe each. Units 4 and 5 began commercial operation in December 1982 and December 1984, respectively.

The Gulf of Mexico provides cooling and receiving waters for Units 1, 2, and 3 condenser and auxiliary cooling systems. Units 4 and 5 are cooled by natural draft cooling towers, with make-up water drawn from Units 1, 2, and 3 discharge canal.

The discharge canal is a dredged canal 2.8 miles long with an average depth of 15 feet. It is located north of Units 1, 2, and 3 extending westward to the Gulf of Mexico.

The intake canal is a dredged canal approximately 14 miles long with an average minimum depth of 20 feet. The canal is bordered on both sides by land beginning from the plant site and extending 3 miles to the west. The canal then extends westward an additional 11 miles out into the Gulf of Mexico.

The original canal was dredged in 1966 by hydraulic cutter suction and drag line to a depth of 15 feet. Approximately 375,000 cubic yards of material was removed, composed of 90% rock.

In 1977, the canal was maintenance-dredged to remove the shoaling that accumulated at the side slopes of the canal. Approximately 12,000 cubic yards of material were removed by a crane with a clam shell bucket and barged upland to a spoil retention pond. Starting in 1978, the intake canal was expanded to the following specifications:

Depth: 20 feet below mean low water level.

Width: From the plants proceeding west, 150 feet wide for 2.8 miles, then 225 feet wide for the next 6.25 miles, then 300 feet wide for the next 4.9 miles to marker #2 of the Cross Florida Barge Canal.

Length: Approximately 14 miles. The canal alignment includes a dogleg at marker #10 and enters the Cross Florida Barge Canal at marker #8.

Spoils: The existing spoil area was extended 1.2 miles on the south side of the intake in the seaward (west) direction. The dike dimensions are 50-100 feet in top width, elevated approximately 10 feet above mean low water.

Capacity: There is an intake canal water flow of approximately 1.3 million gallons per minute during normal plant operation. This results in an incoming water velocity of approximately one (1) foot per second upstream of the intake structures.

Crystal River Mariculture Center

In addition to the five power plants, FPC operates the Crystal River Mariculture Center at the Energy Complex. This multi-species marine hatchery was established to offset fisheries' concerns associated with the once-through cooling systems of Units 1, 2, and 3. FPC will culture and release twelve different marine species. The Mariculture Center consists of a two-story hatchery building outfitted with various tanks and filtered seawater systems along with eight, one-acre ponds. The facility is staffed by professionals trained in marine ecology, fisheries science, and aquaculture.

Intake Structures

The intake structures of the power plants are concrete structures with bar racks, traveling screens, and seawater pump components. Surface water trash barriers are deployed in front of the bar racks to collect large floating debris. Water is drawn from the intake canal through the bar racks, through the traveling screens, into the pumps and flows through the plant condensers and auxiliary systems. The water is then discharged through an outfall into the discharge canal. The discharge canal directs the water back to the Gulf of Mexico.

Bar Racks

The intake bar racks prevent trash and large debris carried by the seawater from entering the intake structure. The seawater must pass through a bar rack made of steel bars spaced on 4-inch centers. The bar racks extend from well above the water line to the concrete base at the bottom of the intake canal.

Units 1 and 2 have two bar racks for each circulating water pump. There are 16 bar racks at the Units 1 and 2 plants. Unit 1 racks are each 8'-2" x 26'-7¾" (217.6 ft^2). The Unit 2 racks are 7'-2" x 26'-7¾" (191 ft^2). Both units have bar racks with a distance between the vertical bars of 3-5/8". Each rack sits at an angle of 12° from vertical, with the bottom section extending out into the intake canal about 5½ feet.

There are a total of eight bar racks at the Unit 3 intake structure. Seven of the bar racks serve the circulating water condenser system. The other bar rack serves the nuclear services and decay heat water systems. The seven large bar racks are 33' high and 15'-7-5/8" wide. The eighth bar rack is 33' high and 9'-3-5/8" wide. All of the bar racks have 4"x3/8" bars at 4-inch centers, with a 3-5/8" distance between the vertical bars. Each bar rack is aligned at an angle of 10° from vertical, with the bottom section extending out into the canal about 5 feet.

Based on mean sea level, circulation flow rate and flow area, the water velocity through Units 1 and 2 bar racks is less than 1 foot per second. The water velocity through Unit 3 is approximately 1 foot per second.

The CR-3 bar racks are cleaned of large debris, as needed, with the use of a mechanical trash rake. This trash rake can be extended down to the bottom of the bar racks and drawn upward to the surface. During periods of high turtle activity in the intake canal, the rake was operated on a daily basis to check for underwater strandings of sea turtles. The Units 1 and 2 bar racks are periodically cleaned using a manual hand rake, and are also removed for cleaning as needed. Bar rack cleaning is performed mechanically by scraping and pressure washing. The bar racks are then coated with a biofouling preventative material.

Traveling Screens

Debris and marine life smaller than the bar rack 3-5/8" openings are able to pass through the bar racks. The traveling screens effectively remove this floating or suspended debris from the intake water to assure a continuous supply of clean water to the condensers and heat exchangers. The traveling screens prevent debris larger than approximately 3/8" from getting to the pumps.

Intake water passes through these screens, which suspend debris and solid materials onto the screens. The screens are conveyed upwards to an overlapping water spray system which washes these materials off the screens and into a debris trough. The traveling screen systems are operated approximately three times per day.

Water Pumps

Each plant has four large circulating water pumps used to draw seawater into the plant. The water is then pumped through the condensers and out to the discharge canal. On Units 1 and 2, the total design flow is 638,000 gpm. Unit 3 design flow is 680,000 gpm. In addition, Unit 3 has a low flow nuclear services water pumping system with a normal flow rate of approximately 10,000 gpm. Under emergency conditions, additional pumps would increase this flow up to approximately 20,000 gpm.

From the discharge of the pumps, the water flows to the main condensers; and for Unit 3, an additional flow path exists for the nuclear services and decay heat cooling water heat exchangers. After the seawater passes through the tubes of the condenser and/or heat exchangers, the seawater is transported in underground pipes to the discharge canal. The discharge canal directs the water back to the Gulf of Mexico.

SEA TURTLES IN THE GULF OF MEXICO

Loggerhead Sea Turtle

The loggerhead turtle (*Caretta caretta)* is a medium-to large sea turtle with a streamlined carapace and limbs modified as flippers. The carapace is elongated and somewhat tapered posteriorly. The head is large with powerful jaws adapted to crushing. The mean straight carapace length of adult southeastern United States loggerheads is about 92 cm with a corresponding mean body weight of about 113 kg. Loggerheads generally have a reddish-brown carapace with a yellow to cream-colored plastron. Hatchlings are brown to reddish-brown dorsally and from buff to gray-black ventrally. The carapace is composed of five pairs of costal scutes, eleven or twelve pairs of marginal scutes, and five vertebral scutes. The loggerhead can be distinguished from other Florida sea turtles by the large size of its head, reddish-brown color, and the presence of two pairs of prefrontal scales on the head and five pairs of pleurals on the carapace.

Loggerhead sea turtles are circumglobal in distribution, but major nesting grounds are located in temperate and subtropical regions, primarily in the southeastern United States, Mexico, Oman, Australia, South Africa, the Mediterranean, and Japan. In Florida, adult loggerheads are found in all coastal waters, and sub-adults frequent the Indian River Lagoon system, among other areas.

In the United States, most nesting occurs from North Carolina southward around the tip of Florida to the vicinity of Tampa Bay. The greatest percentage of loggerhead nesting in the United States occurs in Florida, primarily from Brevard County south to Broward County. Hatchlings and small juveniles from southeastern U. S. beaches ride oceanic currents in offshore drift lines in the Atlantic Ocean for several years, and juvenile loggerheads from Florida have been found rafting as far away as the Azores. Hatchlings and small juveniles are most often associated with floating mats of *Sargassum* in pelagic habitats.

Loggerheads inhabit continental shelves, bays, lagoons, and estuaries in temperate, subtropical, and tropical waters depending on season and life stage. They occur offshore to the western edge of the Gulf Stream, although most individuals prefer the shallow water of the continental shelf. Loggerheads are solitary, although they may form aggregations at sea or in the vicinity of nesting beaches.

Nesting in Florida occurs from late April through September. Loggerheads favor high energy mainland beaches as nesting sites. A female deposits an average of 110 - 120 eggs per nest, and most nest 2 - 6 times per season at 14-day intervals. Most loggerheads do not nest each year. Incubation takes from 50 - 75 days depending on nest temperature. A hatchling's sex is determined by its incubation temperature rather than by genotypic sex determination. Hatching most often occurs at night, and the hatchlings are oriented to the water by positive phototaxis of natural light reflecting off the water surface. Sexual maturity is reached at 15 - 20 years of age depending on growth rate. Little is known of migratory routes or of life history activities away from nesting beaches.

The food of loggerheads consists primarily of mollusks, crustaceans, and horseshoe crabs. As sub-adults, they feed in rich coastal developmental habitats, including lagoonal ecosystems. Loggerheads are active diurnal foragers and make dives of moderate depth and duration.

Loggerhead sea turtles nest farther north than any other sea turtle, and they use a wide variety of habitats during their life span. The Florida population is the second largest nesting population in the world, and one of the only two that includes some individuals that overwinter by burying in mud.

Mortality factors are both natural and human induced. Natural mortality factors affecting nests, hatchlings and adults include predation, beach erosion, tidal inundation, hypothermia, parasitism, disease, and vegetation.

The major predators of nests are raccoons, but eggs are also preyed upon by ghost crabs, hogs, foxes, ants, crows, vultures, and other birds. Hatchlings are eaten by ghost crabs, birds, and many marine predators, and adults are preyed upon by sharks.

The root systems of dune vegetation can invade turtle nests and cause egg mortality, and root systems can grow over a nest and block escape. Hatchlings and females can become fatally entangled in vegetation.

Little is known about diseases in loggerhead turtles or the impact these diseases have on population levels. Papillomas, similar to those found on green turtles, occasionally occur on loggerheads. In addition, a "diseased turtle syndrome" affecting east coast loggerheads has been identified. Stranded turtles have been found infested with blood flukes, and a variety of bacterial and fungal pathogens, which are believed to cause mortalities in loggerheads.

Human-induced mortality factors have been extensively studied. Habitat alteration has accelerated along coastal nesting beaches. This can compromise the suitability of beaches for nesting, result in disturbance of nesting females, destruction of nests by beach activities, and increased injuries and death from boat propellers. Artificial lighting along beachfronts can disorient hatchlings and deter females from nesting.

The most important source of human-induced mortality to juvenile and adult loggerheads is the shrimp fishery. In marine habitats, the National Marine Fisheries Service indicates that greater than 11,000 loggerheads die annually in shrimp trawls. Other types of fishing gear such as gill nets, fish traps, and long lines collectively account for about 10% of the mortality associated with the shrimp fishery, constituting the second largest source of mortality to juveniles and adults.

Dredging has been documented to cause significant turtle mortality in some areas. Boat collisions are also a significant source of mortality in Florida, with 6 - 8% of strandings showing evidence of boat collisions (National Research Council, 1990).

Sea turtle nests are vulnerable to human predation, and though rates of illegal takes are unknown, poaching continues despite regulations against such activities.

More long-term threats result from pollution of the ocean. Plastic debris and tar are commonly found in the digestive tracts of stranded turtles. Loggerheads, especially hatchlings and juveniles, mistake styrofoam, plastic debris, tar balls, and other refuse for food. Though these materials may clog the mouth, throat, gut, and nasal passages of turtles, the exact role of ingested debris in the death of stranded turtles, however, is often unclear.

Entrapment in power plant intake pipes was mentioned in the National Research Council's report as a relatively minor source of turtle mortality. The Council estimates that from New York to Texas, 57 loggerheads are killed per year by power plant entrapment.

Green Sea Turtle

The green sea turtle (*Chelonia mydas)* is the largest hard-shelled turtle. Mature females in Florida have a mean straight carapace length of 101.5 cm and corresponding body weight of 136.1 kg. Hatchlings are solid black to dark gray above with a white margin circumscribing the posterior carapace and the trailing edge of the flippers. The plastron is creamy white. The juvenile carapace is brownish to greenish, with light and dark streaks radiating within each scute. The adult carapace is primarily olive with numerous black spots. The green turtle has four pairs of costal scutes and one pair of prefrontal scales.

The green turtle is circumglobal in distribution, but generally ranges throughout the tropics and subtropics worldwide. In the U. S., green turtles are known to occur from New England to Texas and from Puerto Rico and the Virgin Islands. Nearly all of the species' nesting in the United States occurs in Florida, and most of that along the east coast. There are few records of nesting from the gulf coast of Florida, but there is an important population of immature green turtles in the area from Homosassa Bay to Cedar Key. Other significant populations of immature green turtles forage in the Indian River Lagoon system and Florida Bay.

Hatchlings emerge from beach nests and immediately swim offshore, and are thought to become associated with floating pelagic vegetation. Juveniles first appear along Florida coastal waters at one to three years of age. Juveniles 2 - 60 kg forage as herbivores in shallow coastal waters before abandoning this developmental habitat as sub-adults. The primary habitat of adult green turtles is shallow, protected waters supporting growth of benthic algae and seagrasses.

Nesting occurs on Florida beaches from May to September. Their preferred nesting habitats are on high energy beaches. Females deposit up to six clutches averaging 136 eggs each and return to the same stretch of beach at predominantly two-year intervals. The green turtle does not form social groups and is a solitary nocturnal nester.

Green turtles are diurnal, feeding during the day and often returning to a particular ledge or coral head to spend each night. The green turtle is the only herbivorous sea turtle and one of the very few large marine herbivores. In the pelagic post-hatching stage, green turtles are thought to have an omnivorous or carnivorous diet. Upon entering benthic feeding grounds (20 - 25 cm length), they shift to a diet of algae and seagrasses. Green turtles are selective grazers, favoring growing shoots of seagrasses and a variety of algae. As a result of their low protein herbivorous diet, their growth is slow. They reach sexual maturity later than other sea turtles and have a smaller reproductive output.

Their nesting behavior is very similar to the loggerheads, though they excavate a deeper body pit and produce a higher nest mound. As a result, green turtle eggs are buried deeper than the loggerheads.

The green turtle has been exploited commercially for its meat (turtle steaks and the stock for green turtle soup) more than any of the other sea turtles. In recent years, green turtles have also been the source of skins and oil for the leather and cosmetics trade.

Natural mortality factors affecting eggs and hatchlings are similar to those described for the loggerhead turtle, with a few exceptions. Due to the greater depth of the egg cavity, green turtle nests are less susceptible to predation by raccoons and other small mammals. Green turtles appear to be more susceptible to hypothermia.

Green turtles are subject to a largely species-specific disease called fibropapillomatosis. Though a specific pathogen is yet to be identified, the disease is thought to be viral in origin. The condition is characterized by tumorous growths on the skin and inside the body cavity. These tumors restrict movement, cause blindness, promote parasite infestation, and increase the likelihood of entanglement.

Green turtles are not commonly taken in shrimp trawls, but are vulnerable to entanglement in other varieties of fishing gear. Other human-induced mortality factors are similar to those described for loggerheads.

Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea)* is the largest of all marine turtles, with adults weighing 500 - 900 kg, attaining a carapace length of 150 - 170 cm. The scutes, limb and head scales, and claws typical of nearly all other turtle species are absent, although hatchlings are covered with bead-like scales that disappear within a few months. The overall color of the dorsal surface is black, with variable white spotting. The underside is white or pinkish, with some dark infuscation. The carapace is made primarily of tough, oil-saturated connective tissue raised into seven prominent longitudinal ridges and tapered to a blunt point posteriorly. The beak is strongly cusped at all ages, and in adult females there is a pink blaze on the crown of the head. Specimens between hatchling size and a carapace length of about 120 cm are very rarely encountered.

The morphology is unique, with a shell structure which includes a neomorphic layer of thousands of bones forming a continuous mosaic underlain by a layer of oily connective tissue about 4 cm thick. Physiologically the species is unique among turtles in showing a substantial degree of endothermy, facilitated by counter-current heat exchange mechanisms in the shoulder region to allow the forelimbs to cool close to ambient temperatures without losing significant deep-body heat.

The leatherback is found worldwide, from the tropics to high latitudes. This extremely wide-ranging species nests on tropical beaches, usually mainland shores of the Atlantic, Indian, and Pacific Oceans. Although found in coastal waters, the leatherback is mainly pelagic, and is capable of traveling great distances between nesting and foraging grounds.

Nesting by leatherbacks occurs regularly, though not abundantly, in Florida. Most nesting records are for the Atlantic coast, with few records of hatchlings on the Gulf coast. Preferred nesting habitats are tropical mainland shores with a steep beach profile and deep water close to shore. Philopatry is less precise than in most other marine turtles, and leatherbacks may rapidly occupy newly-formed nesting habitats.

Growth rates in the wild are uncertain but may be extremely rapid, with the possibility of maturity after only three years. Feeding is at the surface or in the water column rather than benthic. Preferred feeding habitats are pelagic, temperate zone waters that support large populations of

jellyfish, the leatherback's main prey item. The diving ability of the leatherback is unmatched by any other reptile. They are capable of dives in excess of 1,000 m to reach food.

Leatherbacks have several adaptations for their highly specialized diet of jellyfish and other coelenterates. They have a highly expandable oral cavity, scissor-like jaws and an esophagus lined with stiff spines that project backward to aid in holding and swallowing prey. Jellyfish are a low energy source and large quantities must be consumed to maintain this large turtle. Pritchard (1979) reported that young leatherbacks in captivity consumed twice their weight in jellyfish daily.

Nesting occurs in the spring and early summer months in the North Atlantic. Nests include, on average, 80 - 85 normal eggs, with the addition of smaller, yolkless, and often deformed eggs. These are laid toward the end of the clutch, and usually are a few dozen in number. As many as 10 nestings may occur in a season, at mean intervals of about 10-½ days. Nesting rarely occurs in successive seasons, and often two non-breeding seasons will occur between nesting seasons.

The leatherback nests are resistant to predators because of the depth of the egg cavity, but the high energy beaches they favor for nesting are very prone to storm erosion. The pelagic nature of the leatherback insulates it from many human-induced sources of mortality like trawling, dredging and boat collisions. Excessive egg collecting in Central America and the beach slaughter of nesting females in Guyana and the Antilles contribute to the decline of the Atlantic populations. The leatherback is vulnerable to plastic ingestion, particularly polyethylene bags, which they mistake for jellyfish. No specific disease pathogens are reported for leatherbacks.

Worldwide the leatherback is more abundant than has often been thought, with an estimated world population of 136,000 breeding females. The National Research Council (1990) concluded that although data is scarce, leatherback populations worldwide appear to be stable.

Hawksbill Sea Turtle

The hawksbill sea turtle (*Eretmochelys imbricata)* is a small to medium-sized sea turtle. Adult females in the Caribbean range from 62.5 - 94.0 cm straight carapace length, with adults weighing between 80 – 127 kg. The species is characterized by two pairs of prefrontal scales, posteriorly overlapping scutes on the carapace (except very young or very old animals), four pairs of costal scutes, two claws on each flipper, and a sharply pointed, beak-like mouth. The carapace is often distinctly patterned with radiating streaks of yellow, reddish brown, brown, and black.

Hawksbills are circumpolar in distribution, being widely distributed in the Caribbean and western Atlantic. They normally occur in Florida southward along the Central American mainland to Brazil and throughout the Bahamas and the Greater and Lesser Antilles, almost always in close association with coral reef habitats. Hawksbills are more sedentary than other species as adults, and the hatchlings do not disperse into the north Atlantic gyre. According to stranding and museum records, the known range of the hawksbill in Florida extends north to Duval County on the east coast and to Levy County on the west coast.

Hawksbills are most typically associated with coral reefs but also occupy other hard-bottom habitats such as limestone ledges and outcroppings.

Hawksbills nest on tropical islands and mainland shores of the tropics worldwide. Typical nesting beaches are low energy narrow beaches often with vegetation growing almost to the water's edge. Hawksbills nest throughout their circumtropical range with few known aggregations. Although historical records of nesting in Florida are rare, increased surveillance of beaches has resulted in the documentation of a few nests nearly every year. Females may nest several times within a season, usually at 15 to 18 day intervals. Nesting in subsequent seasons is usually non-annual. Hawksbills have been observed to exhibit a high degree of nest site fidelity.

A wide variety of food items have been documented in feeding studies of hawksbills. But with the exception of a few fishes, no other vertebrate shares the highly spongivorous feeding habit of the hawksbill. The sharp silicate spicules of the sponges make them unpalatable to many organisms, but are tolerated by the digestive system of the hawksbill.

The mortality factors discussed for loggerheads also apply to hawksbills. The hawksbill is unique as being the source of true tortoiseshell, which is derived from the epidermal scutes overlaying bones of the carapace and plastron. This highly decorative material has been used for centuries in jewelry, ceremonial articles, and inlay work. Although the widespread use of eggs and meat is a threat to the species, exploitation for tortoiseshell is undoubtedly the principal cause for the population decline throughout the world.

In the Caribbean, fisheries for lobster and reef fish have resulted in significant incidental take of the hawksbill.

In Florida, pollution of offshore waters by petroleum products is a serious threat to early life-history stages. Entanglement in monofilament line and nets is also a well documented source of mortality.

Kemp's Ridley Sea Turtle

The Kemp's ridley (*Lepidochelys kempi*) is a small species of sea turtle with an extremely broad carapace, not tapered posteriorly, that is sometimes wider than it is long. The small orbit located high on the head above the deep upper jaw creates a parrot-like appearance. Mature females average about 64 cm in carapace length (range 58 - 75 cm) and range in weight from 32 to 49 kg. Dorsal coloration of the adult is gray to olive-green with a yellowish plastron. Hatchlings are uniformly dark (black when wet), with the plastron becoming lighter (white) after several months. This dark color phase persists well after the pelagic life stage. There is a transition from the juvenile coloration to the adult beginning at about 28 cm carapace length.

Kemp's ridleys are largely confined to the Gulf of Mexico, with a few occurring along the United States eastern seaboard as far north as Long Island Sound. Immature Kemp's ridleys range widely throughout the Gulf of Mexico and in the North Atlantic from Florida northward to Nova Scotia and eastward to Bermuda, the Azores, and Europe. Within the Gulf of Mexico, juveniles are more common in the northern Gulf, particularly in the coastal waters from Texas to Florida.

Kemp's ridleys are associated with a wide range of coastal benthic habitats, usually sand or mud bottoms that support an abundant fauna of crustaceans and other invertebrates. Their primary prey consists of portunid crabs, especially the genus *Callinectes.* However, other crab species are consumed, along with mollusks and other benthic species.

The smallest post-pelagic individuals recorded are about 20 cm in carapace length and are usually found in the shallow coastal waters, bays, and sounds in waters less than 2 m deep. However, movement to deeper, warmer water in the winter months has been reported. Adults and older sub-adults are found in deeper water than juveniles but appear to be restricted to the inshore zone or banks further offshore. Seasonal and reproductive migrations also appear to be restricted to coastal rather than pelagic routes.

Kemp's ridleys show a high degree of social behavior. They aggregate offshore of the nesting beaches, sometimes for days, and then all emerge synchronously to nest, usually during daylight. Almost the entire nesting effort takes place on a few kilometers of beach at Rancho Nuevo, Tamaulipas, Mexico. Some scattered nesting does take place to the north and south of Rancho Nuevo in Mexico. In the United States, a few Kemp's ridleys have been recorded nesting in south Texas and Florida. Kemp's ridleys nest annually and deposit 1 - 3 clutches of about 110 eggs each.

Little is known about the distribution or occurrence of Kemp's ridley hatchlings in the pelagic stage in the Gulf of Mexico. The coastal benthic zone of the northern Gulf of Mexico is an important developmental habitat for young Kemp's ridleys after leaving the pelagic environment. Older sub-adults are found in the eastern Gulf at Cedar Key, Florida. In the Atlantic, sub-adult Kemp's ridleys appear to be highly migratory, foraging as far north as Chesapeake Bay in the spring, summer, and fall, then migrating south in winter to Cape Canaveral, Florida. In New England, small Kemp's ridleys are frequently found cold-stunned in winter in Long Island Sound and Cape Cod Bay.

Mortality factors affecting nests and hatchlings for the Kemp's ridleys are similar to those discussed for loggerheads. There has been a dramatic decline of the nesting assemblage from an estimated 40,000 females in 1947 to approximately 600 females in the late 1980s. Since that time, the number of recorded nests has increased, indicating an increase in the number of nesting females. In 1995, 1,930 Kemp's ridley nests were reported.

Reasons for the decline were intensive egg collecting, taking of females, and shrimp trawl mortality on the foraging grounds. Drowning of Kemp's ridleys in shrimp trawls is believed to be the single most important factor responsible for the continued decline of females and the prevention of recruitment of sub-adults into the breeding stock. The small population and restricted distribution of the Kemp's ridley make it particularly vulnerable to catastrophic population declines.

There are no specific pathogens reported for the Kemp's ridley, although bacterial and fungal infection are major causes of egg mortality in the closely related olive ridley.

The Kemp's ridley is the most seriously endangered of the sea turtles. Five decades ago, Kemp's ridley was very abundant in the Gulf. Its rapid decline since 1947 was most likely caused by human impacts at the primary nesting beach near Rancho Nuevo, Tamaulipas, Mexico and at sea due to shrimp fisheries.

Following the precipitous population decline, the Mexican and U.S. governments began protecting the species. In the mid-1980s, the number of Kemp's ridley nests laid at Rancho Nuevo began to increase in what now appears to be an exponential trend of 11% per year. The annual level of total human-induced mortality and serious injury was estimated by the National Research Council (1990) to be 575 - 5,750 Kemp's ridleys.

Kemp's ridley turtles are known to inhabit the coastal areas of the Gulf of Mexico along the Florida west coast. The area from Homosassa to Cedar Key is an area documented to be frequented by juvenile and sub-adult Kemp's ridleys. Therefore, it would not be unusual to expect immature Kemp's ridleys near the intake canal of the Crystal River Energy Complex.

The Kemp's ridley population appears to be in the early stage of exponential expansion. A majority of the sea turtles stranded at the Crystal River Energy Complex during 1998 were Kemp's ridley sea turtles. Population increases in the Gulf of Mexico could result in an increased occurrence of juvenile and sub-adult Kemp's in the vicinity of the power plant intake canal. It remains to be seen if the large influx of sea turtles, beginning in February 1998, was an unusual event, or the beginning of an increased seasonal presence of sea turtles in the intake canal.

SEA TURTLES AT THE CRYSTAL RIVER ENERGY COMPLEX

Historical Perspective

Five species of marine turtles are known to occur in the Gulf of Mexico. They are the green, hawksbill, Kemp's ridley, leatherback, and loggerhead turtles. Of those, the Kemp's ridley, green, and loggerhead have occasionally been found near the Crystal River Energy Complex.

Since Units 1, 2, and 3 began commercial operation, marine turtles have been occasional visitors in the intake canal. FPC records indicate that from 1994 through 1997, eight sea turtles were stranded on the Unit 3 intake bar racks. During these strandings, the Florida Marine Patrol Division of the Department of Environmental Protection was consulted and provided instructions on handling and disposition.

1998 Occurrences

The number of marine turtle sightings in the intake canal and strandings on the bar racks increased dramatically beginning in late March and early April 1998. The majority of these were Kemp's ridley sea turtles on the Unit 3 bar racks. The sightings and strandings decreased dramatically in May 1998.

During February 1998, FPC discovered two live sea turtles stranded against the bar racks of Crystal River Unit 3. FPC notified FDEP and returned the healthy turtles to the Gulf of Mexico. At the time, the presence of these sea turtles was considered to be typical of the occasional appearance of sea turtles.

During March 1998, an additional 19 sea turtles were stranded and rescued from the Unit 3 bar racks. Four mortalities were discovered floating in the intake canal. These four mortalities were considered not causally related to plant operation since they were found upstream of the power plant intake structures. It is highly unlikely that a turtle mortality related to power plant operation could float upstream against the incoming water current and bypass the surface trash boom structures.

When it became apparent that the influx of sea turtles during March was much higher than historical precedence, FPC took several comprehensive steps to protect sea turtles in the intake canal. These steps included a continuous 24 hour per day observation of the bar racks; implementation of rescue, resuscitation, and handling guidelines; and expedited cleaning of the bar racks.

In April, the influx of sea turtles continued but began to decline toward the end of the month. An additional 14 stranded sea turtles were rescued and 7 mortalities were discovered. Four of the mortalities were discovered in early April when the bar racks were raised for cleaning. From the condition of the carcasses, it is evident that the mortalities had occurred prior to the initiation of the 24-hour observation program. The apparent cause of death was drowning against the bar racks. The other three mortalities were found floating in the intake canal upstream of the power plants and were not considered to be causally related to power plant operation.

During May 1998, the number of sea turtles observed in the intake basin, as well as stranded against the bar racks, began to decrease as rapidly as it had increased. A total of four sea turtles were rescued from the bar racks, with two mortalities also being recovered. One of the mortalities was a carcass seen floating upstream in the intake canal and eventually recovered near the intakes of Unit 1 and 2. It had evidence of a boat collision. The other mortality was a small Kemp's ridley observed to slip between the vertical bars of the Unit 3 bar racks and became stranded between the bar racks and the traveling screens. Rescue efforts were made to release the turtle back out into the intake canal. However, approximately two weeks after the initial observation, the turtle was recovered from the traveling screen trash basket. Attempts at resuscitation were unsuccessful, and the carcass was transferred to the University of Florida for a detailed necropsy. Necropsy results indicated that the sea turtle was likely in a weakened condition due to disease prior to entering the intake structure.

During June and July 1998, no sea turtles were stranded at the Crystal River Energy Complex. The 24-hour continuous observations were reduced to once every 2 hours, 24 hours per day, 7 days per week.

During August 1998, one live sub-adult green turtle was recovered from the bar racks of Units 1 and 2. The turtle had been observed drifting in the canal at the surface and was recovered when it reached the bar racks. The turtle was severely debilitated by fibropapillomatosis and was transferred, under the direction of the FDEP, to the Clearwater Marine Science Center for rehabilitation.

SEA TURTLE PROTECTION ACTIVITIES AT THE CRYSTAL RIVER ENERGY COMPLEX

Sea Turtle Observations

FPC has implemented continuing long-term protective measures at the Crystal River Energy Complex, ensuring the early detection and protection of sea turtles in the intake canal. A copy of the detailed measures is attached to this document as Appendix A. Participating organizations include Site Security, Nuclear Operations, Nuclear Maintenance, Fossil Operations and the Environmental Services departments. Programmatic oversight is provided by Nuclear Operations management.

The appropriate surveillance schedule and plant response are determined by the number of sea turtles observed in the intake canal. A continuous 24 hours per day turtle watch is provided when large numbers of sea turtles are observed in the intake canal or stranded on the bar racks. A minimum observation schedule of once every 2 hours is provided during known turtle presence. Periodic observations are provided at other times. Trained turtle watch personnel routinely observe the intake basin and log any turtle observations so that the presence of sea turtles is known. FPC biologists and environmental staff review these logs to ensure the appropriate actions are being taken. FPC biologists also perform weekly sea turtles observations and quality assurance oversight over the turtle watch personnel. Site Security and plant Control Rooms are promptly notified of any strandings.

Stranded turtles are immediately rescued by turtle watch personnel trained in the proper handling and care of sea turtles. Rescued sea turtles are placed in an appropriate container at the waterfront pending transfer to a designated seawater holding tank at the FPC Mariculture Center. The FPC turtle watch personnel perform an initial evaluation of the rescued turtle's health. If any obvious distress, injury, or disease is evident, a Mariculture Center staff biologist is immediately notified and responds on a 24 hour per day basis. The FDEP is subsequently notified by the Mariculture Center personnel of each stranding and sea turtle condition.

Sea Turtle Rescue and Handling Guidelines

FPC developed the Sea Turtle Rescue and Handling Guidelines based on information from the FDEP and sea turtle experts. FPC developed these procedures to protect the turtles as well as personnel who respond to turtle strandings. Rescue personnel are provided with a basic understanding of sea turtle biology, handling, and rescue techniques.

It has been documented that sea turtles can remain underwater for hours while resting. It is possible that resuscitation procedures may be successful when applied to a turtle rescued from an underwater stranding. Observers and rescue personnel have been trained in sea turtle resuscitation techniques.

These procedures provide for the proper handling of sea turtles to minimize stress, prevent injury, and care for diseased or distressed turtles.

Sea Turtle Stranding and Salvage Network Participation

Sea turtle rescue and resuscitation activities resulted in the successful rescue of 39 live stranded turtles from the intake bar racks. These procedures are also seen as a way to provide valuable data on the Kemp's ridley turtles. A permit from the FDEP has been obtained to allow FPC personnel to perform marine turtle stranding and salvage activities (Appendix B). Sea turtles are identified to species, measured, weighed, and examined for overall health and condition. Healthy turtles are tagged and returned to the Gulf of Mexico north of the plant site as soon as possible. Distressed or injured turtles are held for observation or until transfer to an approved rehabilitation facility can be arranged.

All turtles recovered are to be photographed dorsally and ventrally prior to release. Tags supplied by NMFS are applied to the proximal edge of the foreflipper. The tag numbers, species, and morphometric data of each turtle is reported on a monthly basis to the FDEP. This data is then entered into the FDEP Sea Turtle Stranding and Salvage Network database.

Sea Turtle Netting Activities

In addition to the 24 hour observation program and rescue and resuscitation guidelines, FPC implemented a sea turtle netting pilot program. FPC's objective was to determine the feasibility and efficiency of safely recovering sea turtles from the intake canal before they became stranded on the intake bar racks.

An FDEP approved and permitted consultant with specialization in sea turtle biology and conservation was hired to deploy large mesh entanglement nets in the intake canal. This consultant has over 18 years experience in sea turtle observation, capture and tagging. Recommended turtle netting procedures were implemented to minimize impacts to the turtles. Strict safety guidelines were enforced to ensure the safety of the work crews and the operation of the nuclear plant.

The consultant deployed a 45 m long, 6 m deep net in front of the Unit 3 intake structure (Figure 3). The net was deployed during daylight hours and fished for a total of 16 hours over three days. The net was constantly monitored from a johnboat while being fished. No turtles were captured during the netting effort, although turtles were observed in the intake canal. FPC has pursued improved netting techniques to increase the likelihood of turtle capture success should subsequent netting attempts be considered.

Bar Rack Cleaning

FPC has postulated that marine growth on the intake bar racks might be one of the reasons sea turtles remain in the intake canal. The turtles may regard some of the marine organisms on the bar racks as food items. As the turtles surface for air while swimming near the bar racks, they may be drawn against the racks by the velocity of water. Under certain circumstances, sea turtles may be unable to extricate themselves from the bar racks.

FPC has implemented an increased frequency of bar rack cleaning in an effort to discourage sea turtles from being attracted to the racks. Historically, FPC was cleaning the bar racks on the average of once every six months. In the interval between cleanings, significant fouling growth

has been observed on the bar racks. By increasing the frequency of cleaning, FPC has controlled the amount of fouling growth on the bar racks. Additionally, the water velocity across the bar racks is minimized by maintaining the largest surface area available for water flow. Intake bar racks are now scheduled to be cleaned more frequently and seasonally prior to anticipated turtle influxes. If a sea turtle influx is observed, FPC will inspect the bar racks to ensure that they are in a proper condition of cleanliness.

In response to the possibility that some sea turtles might be stranded underwater against the bar racks, FPC also began operating the Unit 3 trash rake on a more frequent basis. FPC continued increased frequency of operation of the trash rake while sea turtles were observed in the intake canal. One live turtle was rescued and no mortalities were recovered. Periodic continued operation of the trash rake has demonstrated no further underwater strandings.

ASSESSMENT OF PRESENT ENERGY COMPLEX OPERATIONS

Loggerhead Sea Turtle

Although loggerhead sea turtles have been observed in the intake canal, very few have historically been recovered from the intake structures. Due to the low numbers observed and the habitat utilization and behavior of the loggerheads, there will be no impact to the species by the Energy Complex.

Green Sea Turtle

Green turtles have been observed in small numbers in the intake canal and stranded against the intake bar racks. Once the 24-hour observation procedures were implemented, only 2 live sub-adult green turtles were observed and rescued from the bar racks. The 2 green turtles rescued were diseased with fibropapillomatosis. Mortalities recovered from the intake canal include those suffering from a severe infestation of the papilloma tumors.

Due to the low numbers of green turtles encountered at the intake structures, and the specific programs in place for the rescue and resuscitation of impacted sea turtles, there will be no impact to this species by the Energy Complex.

Leatherback Sea Turtle

Leatherback turtles have never been observed in the intake canal or vicinity of the Crystal River Energy Complex. Due to the habitat utilization and behavior of the leatherback, there will be no impact to the species by the Energy Complex.

Hawksbill Sea Turtle

Hawksbill turtles have never been observed in the intake canal or vicinity of the Crystal River Energy Complex. Due to the habitat utilization and behavior of the hawksbill, there will be no impact to the species by the Energy Complex.

Kemp's Ridley Sea Turtle

From February 6, 1998, through May 24, 1998, a total of 38 sea turtles (Figure 4) were rescued live and released or relocated to a rehabilitation facility. Of those, 37 were Kemp's ridley. In addition, on August 12, 1998, a green sea turtle was rescued which was severely debilitated by fibropapillomatosis. All of these turtles were sub-adults, ranging from a straight carapace length of approximately 21 cm to 55 cm. A total of 13 sea turtle mortalities have been recorded. Eight mortalities can be attributed to factors other than the operation of the power plants. These were floating carcasses drawn into the intake canal by the water current. These carcasses eventually become stranded on the intake bar racks or debris screens.

Once FPC implemented the Sea Turtle Rescue and Handling Guidelines measures, all Kemp's ridleys stranded on the bar racks were rescued, except for one mortality. This was the occurrence of a small, diseased individual passing through the 3-5/8" space between the vertical bars on the bar racks. FPC was unsuccessful in subsequent attempts to rescue or remove this individual from the area behind the bar racks.

With the sea turtle protective measures in place, there will be no impact to the species by the Crystal River Energy Complex.

OTHER POTENTIAL STATION IMPACTS

Thermal Effects

The seawater systems of Units 1, 2, and 3 transport water from the intake canal through the main condensers. After the seawater passes through the tubes of the condensers (and heat exchangers for Unit 3), the water is returned through underground pipes to an outfall at the discharge canal. The discharge canal directs the water back to the Gulf of Mexico.

There are no known sea turtle nestings in the vicinity of the Crystal River Energy Complex. There are no known effects from the thermal discharge of Units 1, 2, and 3 on sea turtles or sea turtle nesting.

Barge Activity

Crystal River's four coal-fueled units consume about six million tons of coal each year. The coal is received by train and by ocean barge from coal transloading facilities in Louisiana. The intake canal has been dredged to a depth and width to allow the safe arrival and departure of ocean barges. The barges are moved at a slow speed while in the intake canal and are kept within the marked channel. The 82 foot beam of the barge fills approximately one-half the width of the 150 foot wide double dike area of the canal. Barges typically traverse the marked canal during high tide. The ocean barges dock on the south side of the intake canal for the offloading of coal. The empty barge is then moved to the north side of the intake canal to allow for the loading of mined limerock, which is back-hauled to offloading facilities in Louisiana.

Each barge is approximately 460 feet long and 80 feet wide. With a dry bulk capacity of 681,508 cu. ft., the barge has a loadline draft of 21'-10.25". The ocean tugs attached to the stern of the barges are 136 feet long, with a beam of 40 feet and a maximum draft of 18 feet. The tugs are typically powered by twin diesels, and have two 10-foot diameter propellers which are completely surrounded by kort nozzle shrouds to increase thrust and maneuverability. The tugs sustain a minimum speed while in the intake canal in order to maintain steerage of the barge. The propellers turn at 125 rpm while in the outer canal, and are reduced to 80 rpm from the double dike area to the dock.

To contact the propeller blades, a turtle would have to be drawn through the kort nozzle by the flow of water past the propellers. In such an instance, severe trauma would occur to a turtle which came in contact with the tug boat shrouded propellers. There is no evidence of this type of severe damage to any sea turtle mortalities found floating in the intake canal.

No significant impacts to sea turtle populations are anticipated from continued barge activities in the intake canal.

Chlorination

Units 1 and 2 are permitted under NPDES to chlorinate all four water boxes of the circulating water system to control fouling organisms. Chlorination as a means of fouling control has not been used at Units 1 and 2 for several years.

In the discharge canal, the Energy Complex utilizes helper cooling towers to reduce the temperature of water as limited by the NPDES permit. The helper cooling towers are also permitted to utilize chlorination for fouling control. Sulfur dioxide is used to dechlorinate the treated water prior to discharge into the canal. Chlorination has not been utilized at the helper cooling towers since 1995.

No significant impacts on sea turtles are anticipated from the use of chlorination as a means of biofouling control at Units 1 and 2 and the helper cooling towers.

Clam-Trol

Marine fouling growth occurs on structures in contact with seawater. Most of the intake structures are mechanically cleaned during power plant outages. However, the nuclear plant has a service water system that must be available and reliable during both routine operation and postulated nuclear emergencies. In order to maintain reliability of these service water emergency systems, the marine growth must be controlled.

The growth is controlled by the chemical addition of Clam-trol to the service water and decay heat systems. This chemical addition is made downstream of the bar racks, and is neutralized by clay adsorption prior to release into the discharge canal. Comprehensive biotoxicity testing using sensitive test organisms has shown that the neutralization process is effective. Clam-trol is toxic to fouling invertebrate marine organisms by disrupting oxygen transport across the gill membranes. It is harmless to mammals and other air breathing animals.

Since the injection of Clam-trol is downstream of the bar racks, and neutralization is complete before release to the discharge canal, no significant impacts on sea turtles is anticipated from the continued use of Clam-trol.

Condenser Cleaning Systems

At Units 1 and 2, the condenser tube cleaning system (called SIDTEC) is used to ensure condenser cleanliness by removing fouling that may deposit in the condenser tubes. Flexible cleaning plugs that are oversized with respect to the condenser tube inner diameter are injected into the inlet water boxes of the condenser. The differential pressure between the inlet and discharge of the condenser compresses the plugs and forces them through the condenser tubes.

The floating plugs are discharged to the discharge canal where they are collected by a series of three booms. The boom funnels the plugs to a collection point where they are collected by a centrifugal pump. The plugs are pumped to an open tank and then returned back to the inlet water box. The booms are held in place by a stainless steel cable. The NPDES permit requires that the best management practices be used for the operation of the SIDTEC cleaning system to minimize environmental impact.

The system has just recently begun operation. It is anticipated that it will be operated more frequently in the summer months and less frequently in the winter months. Plans are to initially operate the system for eight consecutive hours twice a week. Schedule and frequency will be adjusted based on the level of condenser cleanliness.

There have been no instances of accidental ingestion of SIDTEC plugs by sea turtles. Due to the short residence time in the discharge canal and the fact that few, if any, of the plugs would be expected to escape the boom capture system, no impacts to sea turtles are anticipated from the continued operation of the SIDTEC condenser cleaning system.

Unit 3 uses a condenser tube cleaning system (called Amertap) to perform condenser cleaning. Elastomeric sponge rubber balls that are oversized with respect to the condenser tube inner diameter are injected into the cooling water stream at the condenser inlet. The differential pressure between the inlet and discharge of the condenser forces the sponge rubber balls through the condenser tubes.

A special screening device, called the strainer section, is installed in the condenser discharge line to funnel the balls along with a small quantity of cooling water into a recirculation pump. The recirculation pump returns the rubber balls to the condenser inlet completing the loop.

Occasionally, some of the balls escape the collector and enter the discharge canal. There are no known instances of sea turtle ingestion of Amertap balls. Therefore, no significant impact to turtles is anticipated from the continued operation of the Amertap condenser cleaning system.

Intake Canal Dredging

Permit No. 199101778 was obtained on November 12, 1991, from the Department of the Army, Jacksonville District Corps of Engineers (ACOE) to perform maintenance dredging of the Crystal River Energy Complex intake canal. The ACOE authority is established under Section 10 of the Rivers and Harbors Act of 3 March 1899 (33 U.S.C. Section 403). The permit is valid through November 12, 2001, and allows up to 560 cubic yards of material to be dredged annually and placed in an existing diked disposal area. The maintenance dredging complies with the State of Florida permitting requirements provided the following conditions are met:

- The spoil material removed must be deposited on a self-contained upland site which prevents the escape of spoil material and return water into surface waters;
- Dredging is limited to that amount necessary to restore the canal to original design specifications;
- Turbidity control devices must be used at the site to prevent the discharge of turbidity and toxic or deleterious substance from discharging into adjacent water during maintenance dredging.

There has been no observed impact to sea turtles during previous dredging operations. All prudent and reasonable steps will be taken during future dredging operations to minimize environmental impacts. This includes a best management practice on dredging operations. In addition, FPC plans to restrict future dredging activities during the presence of sea turtles. Thus, no significant impacts on sea turtles are expected from maintenance dredging operations.

CUMULATIVE IMPACT OF ENERGY COMPLEX OPERATIONS

During the period February 6, 1998, through May 24, 1998, there were 38 live sea turtles successfully rescued from the Crystal River Energy Complex intake bar racks, with 13 mortalities also being recovered. One additional severely diseased green sea turtle was recovered in August 1998. Live turtles were either released to the Gulf of Mexico or transferred to an FDEP approved facility for rehabilitation.

Eight of the mortalities were attributed to factors other than the power plant operation. These include natural as well as human-induced causes. The floating carcasses appeared to have been drawn into the intake canal with the incoming current. The exact causes were difficult to determine since the carcasses were in various stages of decomposition.

Five of the mortalities were likely related to power plant activities. The most probable cause of death for four of the five mortalities was drowning while stranded against the bar racks. These four mortalities in all likelihood occurred prior to the implementation of the Crystal River Energy Complex sea turtle protective measures. The fifth mortality was a small diseased sea turtle which was able to slip past the bar racks and which became confined in the water space between the bar racks and the traveling screens.

Other Energy Complex activities have not been observed to have any detrimental effect on the populations of sea turtles in the Gulf of Mexico. The only station impacts would be those already discussed regarding the bar rack structures.

CONCLUSION

The FPC protective measures for monitoring, rescue and resuscitation, netting, tagging and release activities in coordination with the FDEP are effective in protecting sea turtles and minimize the likelihood of power plant causally related mortalities. The FPC Marine Turtle Permit allows the unlimited rescue of sea turtles under the direction of the FDEP. With these provisions, there will be no jeopardy to any sea turtle species.

FPC expects that lethal takes will occur from both power plant causally related and non-causally related factors at the Crystal River Energy Complex. These can occur despite the best reasonable and prudent protective measures. Based on existing sea turtle protective measures and early 1998 observed sea turtle influx levels, annual lethal takes related to power plant activity are expected to be limited to four Kemp's ridley and one each of green and loggerhead turtles. There are no expected mortalities related to power plant activities for leatherback or hawksbill turtles.

The Crystal River Energy Complex facilities do not influence the occurrence of non-plant related mortalities. These are functions of the level of sea turtle activity along the coast and other factors external to FPC and its operations. FPC's experience with non-plant related mortalities and FDEP's Sea Turtle Stranding and Salvage Network information indicates that mortalities from non-plant related causes are variable and increasing.

For this reason, as well as due to the difficulty in differentiating with certainty between plant and non-plant related causes of death, FPC proposes that no specific numeric mortality limit be established in the Incidental Take Statement. Instead, FPC proposes that sea turtle protection be accomplished through existing FPC protective measures. FPC also proposes to document and report the circumstances surrounding any future sea turtle mortality observed at the Crystal River Energy Complex.

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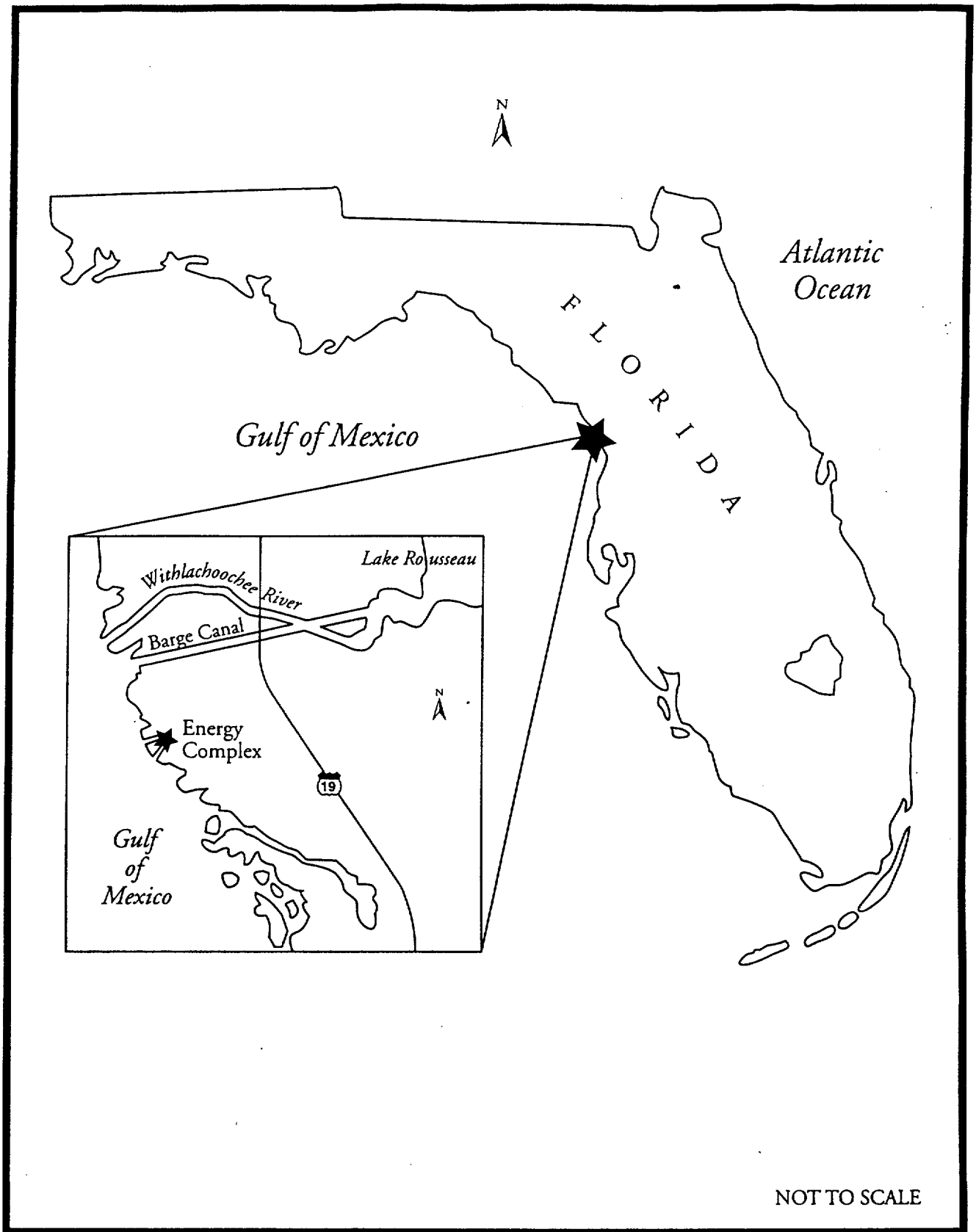

FIGURE 1 *Location of the Crystal River Energy Complex.*

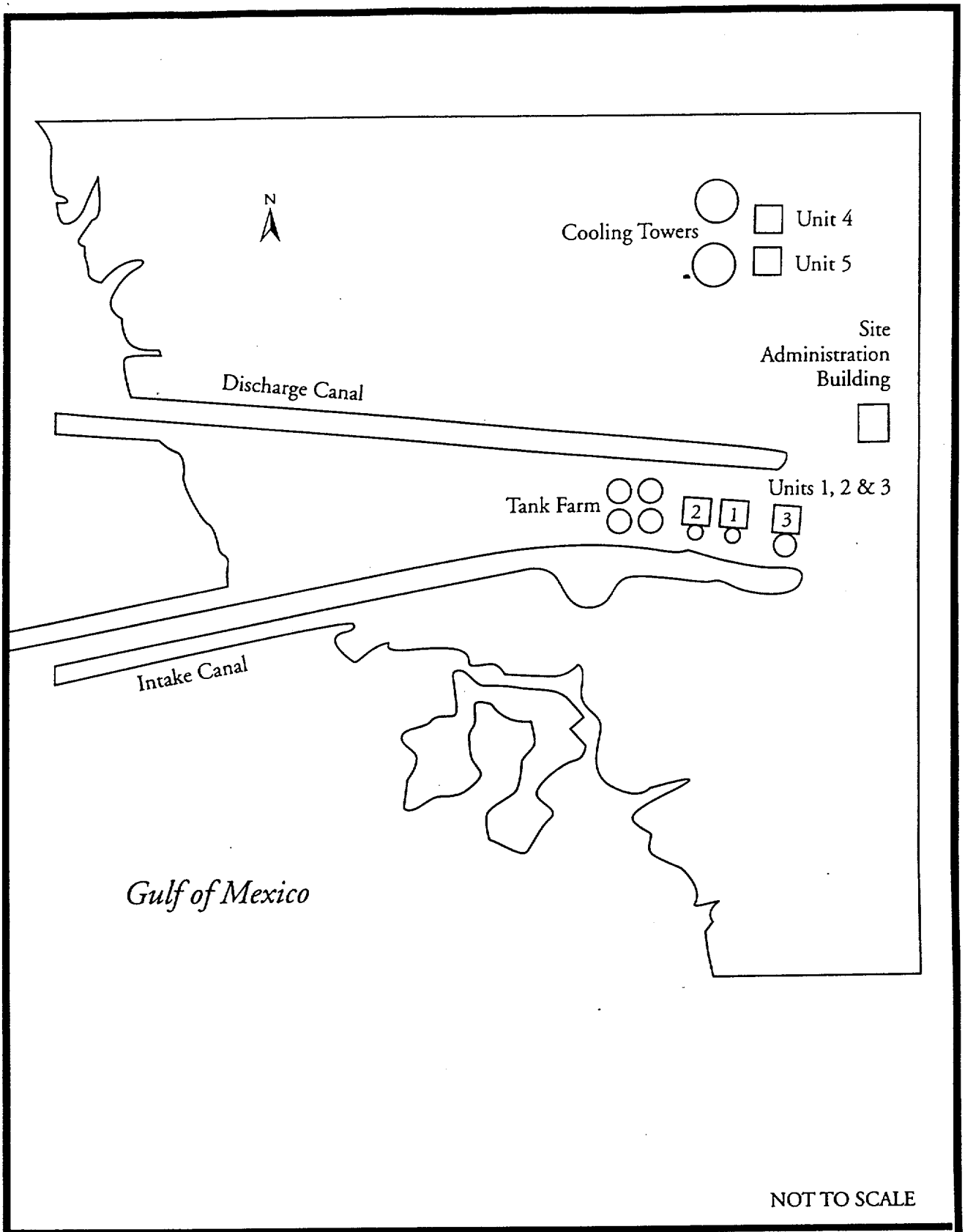

FIGURE 2 *Site layout of the Crystal River Energy Complex.*

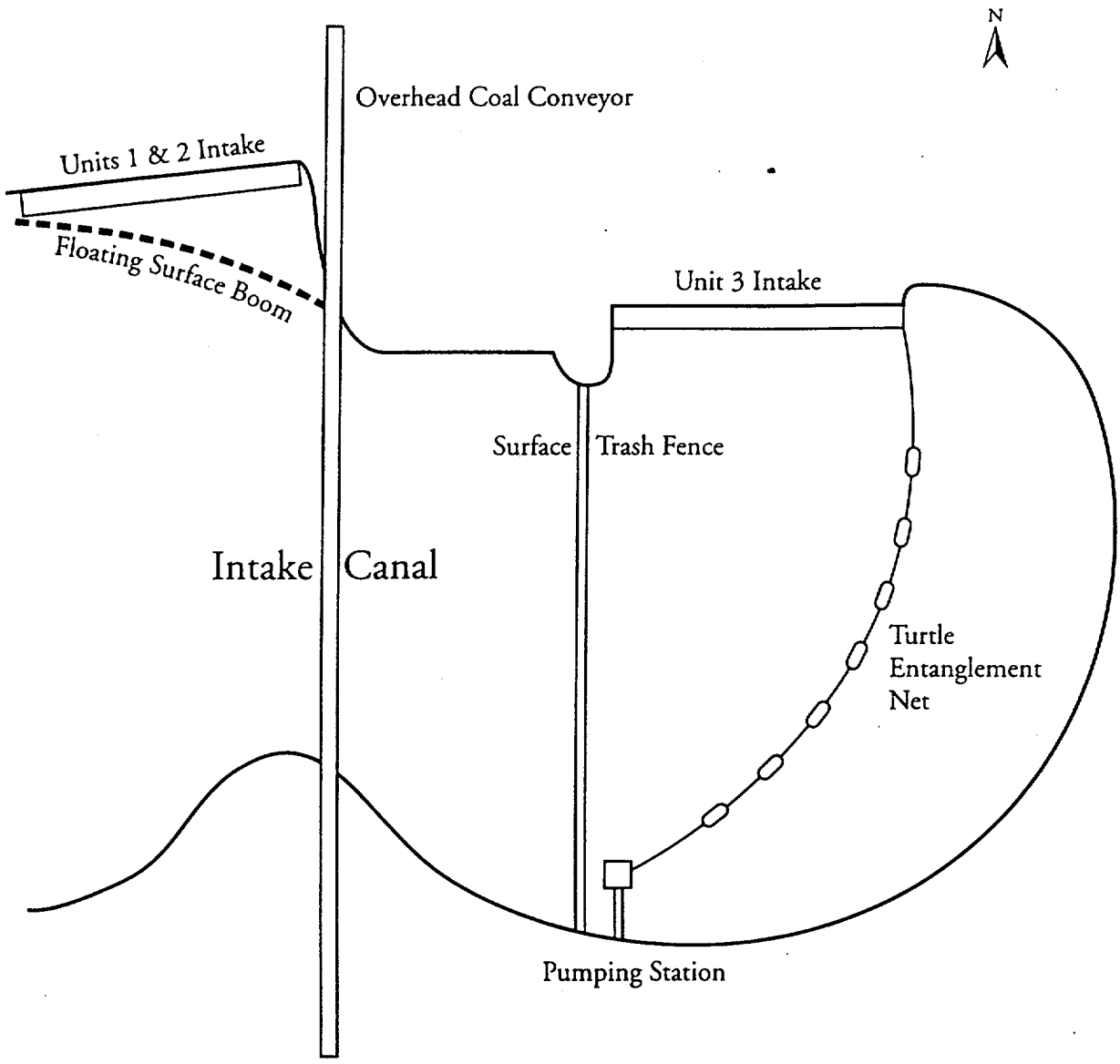

FIGURE 3 *Orientation of turtle entanglement net deployed in the intake canal.*

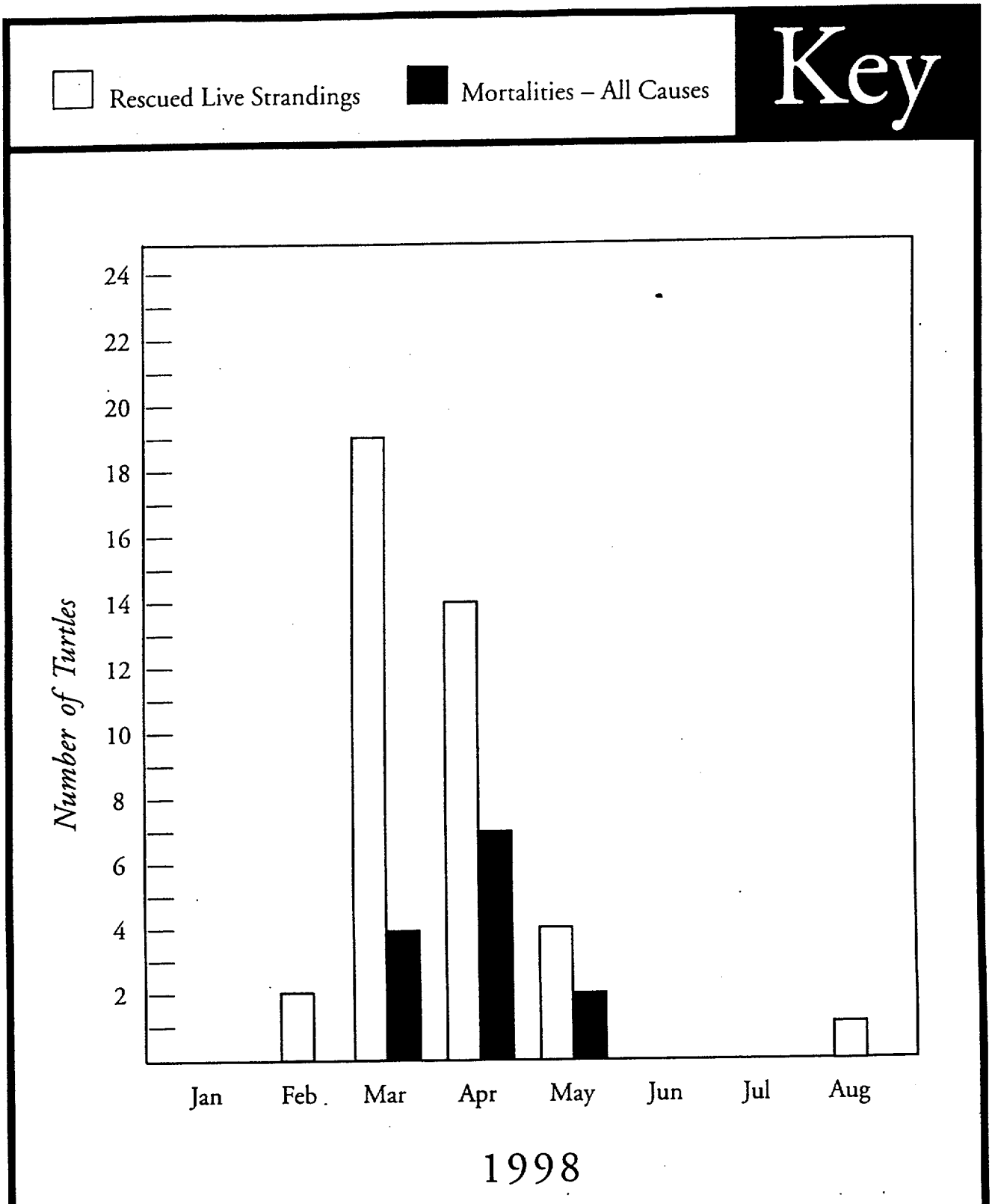

FIGURE 4

Total number of live and dead sea turtles recovered at the Crystal River Energy Complex from January through August, 1998.

APPENDIX A

SEA TURTLE RESCUE & HANDLING GUIDELINES

CRYSTAL RIVER ENERGY COMPLEX

Revision 4

Effective Date: 9/28/98

BACKGROUND

Sea turtles are graceful saltwater reptiles, well adapted to life in the marine environment. With streamlined bodies and flipper-like limbs, they are able to swim long distances in a relatively short time.

Sea turtles are air-breathing, and when they are active they must swim to the water surface every few minutes. Turtles have been observed swimming underwater for periods of up to 20 minutes, and when resting some have been observed to remain underwater for as long as 2 hours without breathing.

OBSERVATION and RESCUE

Call Site Security at extension 4832 or Radio Channel 6.

The Supervisor, Environmental and Radiological Compliance in conjunction with the Manager of the Mariculture Center will determine the appropriate surveillance schedule. A 24 hour per day turtle watch will be provided during periods of high turtle population or stranding incidence on the bar racks. When the 24 hour watch is no longer necessary due to the infrequent observation or absence of sea turtles, a reduced turtle protection program will still be conducted. This reduced program will consist of the following:

Site Security
- inspect bar racks once every 2 hours (except during infrequent times when security staff must respond to other non-routine call out).
- perform 1 hour per day observation of the intake basin to determine presence of sea turtles.
- make routine reports to the Supervisor, Environmental and Radiological Compliance and the Manager, Mariculture Center.

CR-3 Operations
- inspect bar racks once per shift during operation of traveling screens.

CR 1 & 2 Operations
- inspect bar racks once per shift.

Maintenance
- inspect CR-3 bar racks for underwater strandings using the trash rake during periods of turtle influxes as directed by the Supervisor, Environmental and Radiological Compliance.

Mariculture Staff

- perform observations for turtle presence in the intake canal basin for 2 hours per week.
- do a weekly survey of the intake canal to identify the presence of sea turtles.

The Turtle Watch personnel must monitor sea turtle activity in front of the bar racks so that any sea turtle in distress can be safely and efficiently moved to a safe area. The Turtle Watch personnel should:

1) **OBSERVE** the intake basin and log turtle observations so that the presence/absence of turtles is known.

2) **INSPECT** the bar racks for the presence of any stranded or deceased sea turtles.

3) **NOTIFY** the Security Dispatch Desk if a sea turtle is observed stranded on the bar racks (extension 4832 or Radio Channel 6). The Security Captain will dispatch support personnel to the intake area to help the person discovering a turtle. This is to ensure personnel safety and to provide rescue support. The Security support personnel shall keep the Site Security Dispatch Desk informed, who in turn shall keep the applicable Control Room informed during and after the rescue. If requested, the Control Room will likely dispatch a person from Operations to support the rescue (provide manpower or operate equipment).

4) **RECOVER** the sea turtle **IMMEDIATELY** (after notification to the Security Dispatch Desk). Use dip net or other equipment provided to remove the sea turtle. Observe all safety procedures when working at the waterfront. Take all steps possible to minimize stress on the sea turtle.

Turtle Handling Guidance

Note: Turtles are to be protected from harassment at all times.

CAUTION

Gloves should be worn when handling sea turtles.

Sea turtles have powerful crushing jaws. They will bite when handled and can cause significant bodily harm. Keep clear of the turtle's head whenever possible.

Sea turtles may have claws on their front flippers. Keep clear of the front flippers whenever possible.

Handle sea turtle with the nets provided. Only if necessary, handle the turtle by the front and back of the shell. Do not pick them up by the flippers, head, or tail.

DO NOT release any turtle. Any sea turtle that has been stranded against the intake bar racks should be held for identification and evaluation:

- **Healthy turtles** should be immediately placed in the small tank at the intake basin, which has been provided with enough seawater to allow the turtle to float (approximately 6-12 inches). Observe turtle to ensure that it is strong enough to lift its head to breathe.

  During regular business hours, the Security Site Dispatch Desk should contact the Mariculture Center staff for pick-up.

  After hours, or if Mariculture Center staff is unavailable, the turtle should be carefully transported by Site Security personnel to the holding tank at the Mariculture Center.

  Note: The Turtle Rescue personnel are not to abandon their observation post (i.e., this transport is provided by the Security support personnel).

  The Mariculture Center staff will check daily for turtles in the holding tank (including weekends. Therefore, after-hours notification to the Mariculture staff is **NOT** necessary for healthy turtles.

- **Sick, injured** or **weak** turtles should be placed on a wet towel. The turtle should be kept in a cool, quiet area out of direct sunlight. Do not place the turtle on any hot or abrasive surface.

  The Site Security Dispatch Desk should contact the Mariculture staff immediately to inform them of the distressed turtle (24 hours per day). Mariculture staff will respond immediately to provide support.

  Note: Notify Mariculture staff in order of listing on the call out list unless otherwise instructed.

Resuscitation

NOTE

Attempts should be made to resuscitate comatose sea turtles.
Sea turtles can remain motionless and appear dead for up to several hours.

- If turtles are recovered comatose, **ATTEMPT** resuscitation by:

  1) **PLACING** turtle on its back and elevate hindquarters to help drain lungs
  2) **PUMPING** firmly but carefully on the bottom shell with a hand or foot
  3) **MAINTAINING** a pumping rate of approximately 30 times per minute
  4) **REPEATING** several times, while monitoring turtle for signs of breathing

  If no results are achieved after several attempts:

  5) **PLACE** the turtle on its belly
  6) **ELEVATE** the hindquarters several inches
  7) **MAINTAIN** the turtle in the shade on a wet towel
  8) **ATTEND** to sea turtle until the Mariculture Center staff respond to the call out arrive who can perform advanced resuscitation techniques

- **Dead** turtle:

  If sea turtle can not be revived or is obviously dead, place dead turtles in a plastic tank with ice to prevent decomposition and retard odor. Site Security Dispatch Desk should notify the Mariculture staff between 8:00 a.m. and 5:00 p.m., 7 days a week, to arrange for pick-up and disposal per FDEP instructions.

Follow-up Evaluations, Notifications and Documentation

Follow-up Evaluations

- Mariculture staff will perform an identification and health evaluation for all rescued turtles. Following the evaluation, the FDEP will be contacted for instructions on whether to release the turtle to the Gulf of Mexico or to arrange for transportation to a rehabilitation facility. The Clearwater Marine Science Center is an authorized facility for the treatment of sick or injured turtles.

Off-Site Notifications

- FDEP and rehabilitation facility notifications will be made by the Mariculture staff. The Mariculture Center will be used as an interim facility to hold sea turtles prior to pick-up and treatment or disposal.

- The Security Dispatch Desk will log turtle events accordingly.

- The Control Room will make NRC notifications in accordance with CR-3 procedures.

Documentation

- The Turtle Watch Rescue should document:

    1) Time of incident.
    2) Position sea turtle was found.
    3) Activity level of sea turtle.
    4) Any injuries or other abnormal conditions of the sea turtle.
    5) Any other relevant information.

- The Security Dispatch Desk will collect and maintain data entry logs from the Turtle Watch Rescue.

- The respective Control Rooms will log turtle rescue and mortality events.

Department of Environmental Protection

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

MARINE TURTLE PERMIT

Mr. David A. Bruzek
Florida Power Corporation
15760 West Powerline Street, FH-34
Crystal River, Florida 33428

TP #042

Permit Expires: 31 January 1999

New Permit.

Authorized To: (1) conduct stranding/salvage activities.

Authorized Nesting Survey Area: None.

Authorized Research Projects: None.

Authorized Personnel: D. Bruzek, E. Latimer, S. Butler, E. Olsen.

General Conditions: Permitted individuals must adhere to the FDEP marine turtle permit guidelines developed under a Section 6 Cooperative Agreement between FDEP and the U.S. Fish and Wildlife Service.

Special Conditions: None.

David W. Arnold

7-20-98

David W. Arnold, Chief
Bureau of Protected Species Management
Division of Marine Resources

Date

cc: Sandy MacPherson, Southeast Regional Sea Turtle Coordinator, USFWS
FMP, District(s) General Headquarters
FDEP, Tequesta Office

WEEKLY BRANCH CHIEF REPORT

BRANCH: 3 SIGNATURE: Leonard Wert **WEEK ENDING: 01/21/2000**

SIGNIFICANT PLANT ISSUES/EVENTS

CR- The licensee has issued plans to rotate several Directors in the site organization early in 2000. On January 12 and 14, 2000, the licensee announced major changes in the Nuclear Regulatory Affairs and Nuclear Engineering and Projects Departments. These revised structures will better serve and support CR-3 plant operation.

On January 18, 2000, the Regional Administrator visited the site and had an informal group discussion with FPC Directors.

Media Interest (Ref. An article from St. Peter times). On January 18, 2000, a female manatee and a calf were found dead in the Units 1 & 2 cooling tower recirc pipe (coal plants). FPC reported the issue to the state. No 50.72 report was not required since it did not involve CR 3.

SIGNIFICANT INSPECTION FINDINGS/BRANCH ACCOMPLISHMENTS

SL- 40500 Corrective Action Program inspection was completed last week. One NCV was identified in the area of EOP issues. Trending was noted as not always effective. In general, workers and management indicated support for the corrective action program. During interviews, workers indicated that over the last year, management had increased their confidence in the corrective action program. Corrective action program backlogs are being reduced and overall, the threshold for Condition Report initiation was appropriate.

CR- Selection process of CR SRI position was completed.

STAFFING ASSIGNMENTS/AVAILABILITY

S. Sanchez, T, Ross, C. Patterson will attend the new reactor oversight program training next week at TTC.

PLANNED ACTIVITIES NEXT WEEK

SL Initial Exam Prep - C. Payne and M. Ernstes

TP Emergency Preparedness Core Inspection - Bill Sartor

Radiation Protection Core Inspection - G. Kuzo

A/C

POWER REACTOR

EVENT NUMBER: 36541

FACILITY: CRYSTAL RIVER REGION: 2
UNIT: [3] [ ] [ ] STATE: FL
RX TYPE: [3] B&W-L-LP

NOTIFICATION DATE: 12/27/99
NOTIFICATION TIME: 11:20 [ET]
EVENT DATE: 12/27/99
EVENT TIME: 10:00[EST]
LAST UPDATE DATE: 12/27/99

NRC NOTIFIED BY: RICKY E. RAWLS
HQ OPS OFFICER: LEIGH TROCINE

NOTIFICATIONS

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

CHRIS CHRISTENSEN R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

OFFSITE NOTIFICATION REGARDING THE RESCUE OF AN ENDANGERED SEA TURTLE

The following text is a portion of a facsimile received from the licensee:

"An endangered Kemp-Ridley sea turtle was rescued at the [Crystal River Unit 3] intake area. The endangered turtle was NOT injured. The turtle was transported to the Florida Power [Corporation] Mariculture Center. The Florida Department of Environmental Protection was notified at 1000 EST on 12/27/99."

The licensee also notified the NRC resident inspector.

A/7

POWER REACTOR

EVENT NUMBER: 36520

FACILITY: CRYSTAL RIVER REGION: 2
UNIT: [3] [ ] [ ] STATE: FL
RX TYPE: [3] B&W-L-LP

NRC NOTIFIED BY: RICKY RAWLS
HQ OPS OFFICER: STEVE SANDIN

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

NOTIFICATION DATE: 12/16/99
NOTIFICATION TIME: 23:05 [ET]
EVENT DATE: 12/16/99
EVENT TIME: 20:47[EST]
LAST UPDATE DATE: 12/16/99

NOTIFICATIONS

ANN BOLAND R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

STATE OF FLORIDA NOTIFICATION INVOLVING RESCUED LOGGER HEAD SEA TURTLE

"[An] endangered Logger Head Sea Turtle was rescued at the Crystal River (CR-3) intake area. The turtle was injured but is expected to live. The Turtle was transported to Florida Power Corp. Mariculture Center. The Florida Department of Environmental Protection was notified at 2047 EST on 12/26/99."

The licensee also informed the NRC Resident Inspector.

POWER REACTOR

EVENT NUMBER: 36448

FACILITY: CRYSTAL RIVER
UNIT: [3] [ ] [ ]
RX TYPE: [3] B&W-L-LP

REGION: 2
STATE: FL

NOTIFICATION DATE: 11/18/99
NOTIFICATION TIME: 10:15 [ET]
EVENT DATE: 11/18/99
EVENT TIME: 08:00[EST]
LAST UPDATE DATE: 11/18/99

NRC NOTIFIED BY: SHAWN SIMON
HQ OPS OFFICER: DOUG WEAVER

NOTIFICATIONS

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

EDWARD MCALPINE R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

OFFSITE NOTIFICATION - ILL GREEN SEA TURTLE

A GREEN SEA TURTLE WAS TRANSPORTED TO THE SITE MARICULTURE CENTER FOR MONITORING AND EVALUATION. THE TURTLE WAS DETERMINED TO BE IN POOR HEALTH WITH AN ILLNESS NOT ATTRIBUTED TO PLANT OPERATION. THE LICENSEE NOTIFIED THE STATE OF FLORIDA ENVIRONMENTAL AGENCY.

THE LICENSEE NOTIFIED THE NRC RESIDENT INSPECTOR.

A/9

POWER REACTOR

EVENT NUMBER: 35800

FACILITY: CRYSTAL RIVER
UNIT: [3] [ ] [ ]
RX TYPE: [3] B&W-L-LP

REGION: 2
STATE: FL

NRC NOTIFIED BY: WILLIAM KISNER
HQ OPS OFFICER: BOB STRANSKY

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

NOTIFICATION DATE: 06/05/99
NOTIFICATION TIME: 01:27 [ET]
EVENT DATE: 06/04/99
EVENT TIME: 23:55[EDT]
LAST UPDATE DATE: 06/05/99

NOTIFICATIONS

KENNETH BARR R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	85	Power Operation	85	Power Operation

EVENT TEXT

LIVE TURTLE FOUND IN INTAKE STRUCTURE

The licensee notified the Florida Department of Environmental Protection regarding the discovery of a live Loggerhead Turtle on the intake bar racks. The turtle was removed and transported to the mariculture center. The NRC resident inspector has been informed of this notification by the licensee.

A/10

POWER REACTOR

EVENT NUMBER: 35581

FACILITY: CRYSTAL RIVER REGION: 2
UNIT: [3] [ ] [ ] STATE: FL
RX TYPE: [3] B&W-L-LP

NRC NOTIFIED BY: SIMON
HQ OPS OFFICER: CHAUNCEY GOULD

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

NOTIFICATION DATE: 04/12/99
NOTIFICATION TIME: 16:12 [ET]
EVENT DATE: 04/12/99
EVENT TIME: 13:48[EDT]
LAST UPDATE DATE: 04/12/99

NOTIFICATIONS

WALTER RODGERS R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

KEMPS RIDLEY SEA TURTLE FOUND ALIVE AT THE PLANT'S INTAKE AREA.

THE TURTLE WAS TRANSPORTED TO THE MARICULTURE CENTER FOR OVERNIGHT OBSERVATION. FLORIDA DEPARTMENT OF ENVIRONMENT HAS BEEN NOTIFIED.

THE RESIDENT INSPECTOR WAS NOTIFIED.

A/11

POWER REACTOR

EVENT NUMBER: 35509

FACILITY: CRYSTAL RIVER
UNIT: [3] [ ] [ ]
RX TYPE: [3] B&W-L-LP

REGION: 2
STATE: FL

NRC NOTIFIED BY: SERGIO ORTIZ
HQ OPS OFFICER: JOHN MacKINNON

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

NOTIFICATION DATE: 03/25/99
NOTIFICATION TIME: 08:52 [ET]
EVENT DATE: 03/25/99
EVENT TIME: 08:12[EST]
LAST UPDATE DATE: 03/25/99

NOTIFICATIONS

MARK LESSER R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

OFFSITE NOTIFICATION MADE TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION CONCERNING A KEMPS RIDLEY SEA TURTLE BEING FOUND IN THE INTAKE STRUCTURE.

A SUB-ADULT KEMPS RIDLEY SEA TURTLE WAS FOUND IN THE PLANT'S INTAKE STRUCTURE. THE LIVE KEMPS RIDLEY SEA TURTLE WAS TRANSPORTED TO THE MARICULTURE CENTER FOR DISPOSITION/EVALUATION. THE TURTLE WILL BE TRANSPORTED TO THE CLEARWATER MARINE SCIENCE CENTER FOR REHABILITATION. THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION WAS NOTIFIED BY THE LICENSEE OF THIS EVENT.

THE NRC RESIDENT INSPECTOR WILL BE NOTIFIED OF THIS EVENT BY THE LICENSEE.

A/12

POWER REACTOR

EVENT NUMBER: 35441

FACILITY: CRYSTAL RIVER REGION: 2
UNIT: [3] [ ] [ ] STATE: FL
RX TYPE: [3] B&W-L-LP

NOTIFICATION DATE: 03/05/99
NOTIFICATION TIME: 10:49 [ET]
EVENT DATE: 03/05/99
EVENT TIME: 09:51 [EST]
LAST UPDATE DATE: 03/05/99

NRC NOTIFIED BY: RICHARD SWEENY
HQ OPS OFFICER: FANGIE JONES

NOTIFICATIONS

EMERGENCY CLASS: NON EMERGENCY
10 CFR SECTION:
APRE OFFSITE NOTIFICATION

CAUDLE JULIAN R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

STATE NOTIFIED OF A KEMP'S RIDLEY SEA TURTLE RETRIEVED FROM THE PLANT INTAKE WATER

A young healthy Kemp's Ridley sea turtle was taken from the water at the intake of Crystal River Unit 3. The turtle was transported to the Crystal River Mariculture Center. The Florida Department of Environmental Protection was notified of the retrieval of the sea turtle. The turtle will be transported to the Clearwater Marine Science Center.

The licensee plans to notify the NRC Resident Inspector.

A/13

POWER REACTOR	EVENT NUMBER: 35417

FACILITY: CRYSTAL RIVER REGION: 2 UNIT: [3] [ ] [ ] STATE: FL RX TYPE: [3] B&W-L-LP	NOTIFICATION DATE: 02/27/99 NOTIFICATION TIME: 09:07 [ET] EVENT DATE: 02/27/99 EVENT TIME: 08:10 [EST] LAST UPDATE DATE: 02/27/99
NRC NOTIFIED BY: LARRY MOFFATT HQ OPS OFFICER: DICK JOLLIFFE	NOTIFICATIONS
EMERGENCY CLASS: NON EMERGENCY 10 CFR SECTION: APRE OFFSITE NOTIFICATION	ROBERT HAAG R2

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	Power Operation	100	Power Operation

EVENT TEXT

- STATE NOTIFIED OF A KEMP'S RIDLEY SEA TURTLE RETRIEVED FROM THE PLANT INTAKE WATER -

At 2232 on 02/26/99, a young Kemp's Ridley sea turtle was taken from the water at the intake of Crystal River Unit 3. The turtle was found pinned against the bar rack and was retrieved by site personnel in accordance with the Florida Power Corporation Turtle Protection Guidelines. Crystal River Mariculture Center personnel took custody of the sea turtle and will return it to the Gulf of Mexico In the afternoon of 02/27/99. At 0810 on 02/27/99, the Florida Department of Environmental Protection was notified of the retrieval of the sea turtle.

The licensee notified the NRC Resident Inspector.

A/1H

POWER REACTOR

EVENT NUMBER: 34007

FACILITY: CRYSTAL RIVER REGION: 2
UNIT: [3] [ ] [ ] STATE: FL
RX TYPE: [3] B&W-L-LP

NOTIFICATION DATE: 04/02/98
NOTIFICATION TIME: 16:49 [ET]
EVENT DATE: 04/02/98
EVENT TIME: 10:10 [EST]
LAST UPDATE DATE: 05/12/98

NRC NOTIFIED BY: RICKY RAWLS
HQ OPS OFFICER: JOHN MacKINNON

NOTIFICATIONS

EMERGENCY CLASS: NOT APPLICABLE
10 CFR SECTION:
APRE 50.72(b)(2)(vi) OFFSITE NOTIFICATION

TOM PEEBLES RDO

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	POWER OPERATION	100	POWER OPERATION

EVENT TEXT

PFFSITE NOTIFICATION REGARDING ANOTHER SEA TURTLE AT THE INTAKE STRUCTURE
FER TO EVENT NUMBERS 33979 AND 33988 FOR PAST PROBLEMS WITH TURTLES.)

FLORIDA POWER CORPORATION FOUND A DISTRESSED SEA TURTLE AT THE INTAKE STRUCTURE FOR CRYSTAL RIVER UNIT 3. THE TURTLE WAS DETERMINED TO BE A KEMP'S RIDLEY SEA TURTLE, WHICH IS AN ENDANGERED SPECIES. AT 1400 ON 04/02/98, THE LICENSEE NOTIFIED THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) AND THE U.S. FISH AND WILDLIFE SERVICE OF THE DISCOVERY OF THE TURTLE. THE LICENSEE IS CONTINUING TO WORK WITH THE FDEP AND THE U.S. FISH AND WILDLIFE SERVICE TO DETERMINE THE REASON FOR THE INCREASED NUMBER OF DEAD AND DISTRESSED SEA TURTLES THAT HAVE BEEN FOUND AT THE CRYSTAL RIVER SITE IN THE PAST FEW WEEKS.

THE NRC RESIDENT INSPECTOR WAS NOTIFIED OF THE OFFSITE NOTIFICATION BY THE LICENSEE.

UPDATE ON 04/02/98 AT 1753 FROM RAWLS TAKEN BY MACKINNON

AT 1658 ON 04/02/98, THE LICENSEE FOUND ANOTHER KEMP'S RIDLEY SEA TURTLE IN DISTRESS AT THE INTAKE STRUCTURE. THE FDEP WAS NOTIFIED BY THE LICENSEE AT 1658.

THE NRC RESIDENT INSPECTOR WILL BE NOTIFIED OF THIS EVENT UPDATE BY THE LICENSEE. THE NRC OPERATIONS CENTER NOTIFIED THE R2DO (PEEBLES).

UPDATE ON 04/03/98 AT 1132 FROM R. SWEENEY TAKEN BY MACKINNON

0634 ON 04/03/98, A DISTRESSED KEMP'S RIDLEY SEA TURTLE WAS FOUND AT THE

(Continued on next page)

A/13

INTAKE STRUCTURE FOR CRYSTAL RIVER UNIT 3. AT 0720, A DECEASED KEMP'S RIDLEY SEA TURTLE WAS FOUND IN THE INTAKE STRUCTURE. KEMP'S RIDLEY SEA TURTLES ARE ON THE ENDANGERED SPECIES LIST. THE SEA TURTLES HAVE BEEN TURNED OVER TO THE CLEARWATER MARINE SCIENCE CENTER PER THE DIRECTION OF THE FDEP. THE LICENSEE IS CONTINUING TO WORK WITH THE FDEP, U.S. FISH AND WILDLIFE SERVICE, AND NATIONAL MARINE FISHERIES SERVICE TO DETERMINE THE REASON FOR THE INCREASED NUMBER OF DEAD AND DISTRESSED SEA TURTLES THAT HAVE BEEN FOUND AT THE CRYSTAL RIVER UNIT 3 SITE DURING THE PAST FEW WEEKS. THE LICENSEE NOTIFIED THE FDEP OF THE ABOVE EVENT. THE LICENSEE PLANS TO ROUTINELY NOTIFY THE FDEP FOR FUTURE CAPTURE OF LIVE TURTLES; HOWEVER, THE LICENSEE DOES NOT PLAN TO REPORT TO THE NRC EACH INDIVIDUAL NOTIFICATION OF THE FDEP. NOTIFICATION WILL BE MADE TO THE NRC WHEN FDEP IS NOTIFIED OF A DECEASED TURTLE.

THE NRC RESIDENT INSPECTOR WILL INFORMED BY THE LICENSEE OF THIS EVENT UPDATE. THE NRC OPERATIONS CENTER NOTIFIED THE R2DO (PEEBLES).

UPDATE ON 04/03/98 AT 1722 FROM RAWLS TAKEN BY MACKINNON

AT 1450 ON 04/03/98, THE LICENSEE NOTIFIED THE FDEP THAT A DECEASED SEA TURTLE WAS FOUND IN THE INTAKE STRUCTURE AT 1310.

THE NRC RESIDENT INSPECTOR WAS NOTIFIED OF THIS EVENT NOTIFICATION BY THE LICENSEE. THE NRC OPERATIONS CENTER NOTIFIED THE R2DO (PEEBLES).

UPDATE ON 04/04/98 AT 1320 FROM RAWLS TAKEN BY MACKINNON

0945 ON 04/04/98, THE LICENSEE NOTIFIED THE FDEP THAT ANOTHER DEAD KEMP'S RIDLEY SEA TURTLE WAS FOUND IN THE INTAKE STRUCTURE AT 0530. THE LICENSEE STATED THAT THE MORTALITY OF ENDANGERED SPECIES IS LIKELY IN PART TO BE RELATED TO THE PLANTS OPERATION AND IS, THEREFORE, ALSO REPORTABLE TO THE NRC UNDER THE ENVIRONMENTAL PROTECTION PLAN. THE LICENSEE IS STILL WORKING WITH THE FDEP, U.S. FISH AND WILDLIFE SERVICES, AND THE NATIONAL FISHERIES SERVICE TO DETERMINE THE REASON FOR THE INCREASED NUMBER OF DEAD AND DISTRESSED SEA TURTLES THAT HAVE BEEN FOUND AT THE CRYSTAL RIVER SITE DURING THE PAST FEW WEEKS. THE LICENSEE PLANS TO ROUTINELY NOTIFY THE FDEP FOR FUTURE CAPTURE OF LIVE TURTLES; HOWEVER, THE LICENSEE DOES NOT PLAN TO REPORT TO THE NRC EACH INDIVIDUAL NOTIFICATION OF THE FDEP. NOTIFICATION WILL BE MADE TO THE NRC WHEN FDEP IS NOTIFIED OF A DECEASED TURTLE.

THE NRC RESIDENT INSPECTOR WAS NOTIFIED OF THIS EVENT NOTIFICATION BY THE LICENSEE. THE NRC OPERATIONS CENTER NOTIFIED THE R2DO (PEEBLES).

* * * UPDATE 1815 4/13/1998 FROM BILL BANHAUER TAKEN BY STRANSKY * * *

AT 1600 ON 4/13/1998, ANOTHER DEAD KEMP'S RIDLEY SEA TURTLE WAS FOUND IN THE COMMON INTAKE FOR CRYSTAL RIVER UNITS 1, 2, AND 3. THE TURTLE'S DEATH DOES NOT APPEAR TO BE DIRECTLY RELATED TO PLANT OPERATION. THE NRC RESIDENT INSPECTOR HAS BEEN INFORMED. NOTIFIED R2DO (SKINNER).

* * * UPDATE AT 1732 ON 04/21/98 FROM DICK SWEENEY TO DICK JOLLIFFE * * *

1330 ON 04/21/98, THE LICENSEE FOUND TWO DEAD KEMP'S RIDLEY SEA TURTLES UPSTREAM OF THE INTAKE TRASH SCREEN. AT 1531, THE LICENSEE NOTIFIED THE

(Continued on next page)

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION OF THE DISCOVERY OF THE 'TLES. THE LICENSEE IS CONTINUING TO WORK WITH THE FLORIDA DEPARTMENT ENVIRONMENTAL PROTECTION AND THE NATIONAL MARINE FISHERIES SERVICES TO DETERMINE THE REASON FOR THE INCREASED NUMBER OF DEAD AND DISTRESSED SEA TURTLES THAT HAVE BEEN FOUND AT THE CRYSTAL RIVER SITE DURING THE PAST FEW WEEKS.

THE LICENSEE INFORMED THE NRC RESIDENT INSPECTOR. THE NRC OPERATIONS OFFICER NOTIFIED THE R2DO WALTER ROGERS.

* * * UPDATE AT 1045 ON 05/06/98 BY BILL BANDHAUER TO DICK JOLLIFFE * * *

AT 1700 ON 05/05/98, THE LICENSEE FOUND A DEAD KEMP'S RIDLEY SEA TURTLE AT THE UNIT 2 INTAKE STRUCTURE. THE TURTLE HAS TWO SEVERE CRACKS ON ITS UNDERSIDE APPARENTLY HAVING BEEN HIT BY A BOAT. THIS TURTLE'S DEATH IS NOT LIKELY DUE TO PLANT OPERATION. THE LICENSEE REPORTED THIS TURTLE TO FLORIDA STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THE NRC RESIDENT INSPECTOR. THE NRC OPERATIONS OFFICER NOTIFIED THE R2DO PAUL FREDRICKSON.

*** UPDATE ON 5/12/98 @ 1925 BY STEPHENSON TO GOULD ***

THE LICENSEE NOTIFIED THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION THAT AN ADDITIONAL DEAD KEMP'S RIDLEY SEA TURTLE HAD BEEN FOUND AT THE PLANT'S INTAKE STRUCTURE. THE TURTLE WAS ABOUT 8" ACROSS AND SHOWED NO EVIDENCE OF EXTERNAL INJURY. THE LICENSEE CONCLUDED THAT THE DEATH WAS PROBABLY CAUSALLY RELATED TO THE OPERATION OF THE PLANT.

RESIDENT INSPECTOR WILL BE NOTIFIED.

THE REG2 RDO(BOLAND) WAS NOTIFIED.

POWER REACTOR

EVENT NUMBER: 33988

LITY: CRYSTAL RIVER UNIT: [3] [ ] [ ] RX TYPE: [3] B&W-L-LP	REGION: 2 STATE: FL
NRC NOTIFIED BY: BILL STEPHENSON HQ OPS OFFICER: DICK JOLLIFFE	
EMERGENCY CLASS: NOT APPLICABLE 10 CFR SECTION: APRE 50.72(b)(2)(vi) OFFSITE NOTIFICATION	

NOTIFICATION DATE:	03/28/98
NOTIFICATION TIME:	11:15 [ET]
EVENT DATE:	03/28/98
EVENT TIME:	10:30 [EST]
LAST UPDATE DATE:	04/01/98

NOTIFICATIONS

PAUL FREDRICKSON RDO

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	POWER OPERATION	100	POWER OPERATION

EVENT TEXT

- OFFSITE NOTIFICATION REGARDING DEAD SEA TURTLE FOUND IN PLANT INTAKE -

LICENSEE NOTIFIED THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) AND THE U.S. FISH AND WILDLIFE SERVICE (FWS) REGARDING THE DISCOVERY OF A DEAD SEA TURTLE AT 2345 ON 03/27/98. A LICENSEE BIOLOGIST EXAMINED THE TURTLE AND DETERMINED THAT IT IS A RARE KEMP'S RIDLEY SEA TURTLE AND THAT IT HAD DIED APPROXIMATELY TWO DAYS BEFORE ITS DISCOVERY.

THE LICENSEE HAS BEEN WORKING WITH FLORIDA DEP REGARDING AN INCREASE IN THE NUMBER OF TURTLE SIGHTINGS AT THE PLANT INTAKE AND IS NOW WORKING WITH FWS. (REFER TO EVENT #33979 FOR ADDITIONAL INFORMATION.)

THE LICENSEE INFORMED THE NRC RESIDENT INSPECTOR.

* * * UPDATE AT 1353 ON 03/30/98 BY RICK SWEENEY ENTERED BY GOULD * * *

AS REPORTED, SEVERAL ENDANGERED SPECIES OF KEMP'S RIDLEY SEA TURTLES HAVE BEEN OBSERVED IN THE INTAKE BASIN. SOME HAVE BEEN FOUND DEAD OR IN A WEAKENED CONDITION. HISTORICALLY, SEA TURTLES HAVE BEEN SEEN IN THE INTAKE BASIN. THE LICENSEE HAS BEGUN DIALOG WITH BOTH FLORIDA DEP AND THE U.S. FISH AND WILDLIFE SERVICE/NATIONAL MARINE FISHERIES SERVICE. THE NATIONAL MARINE FISHERIES SERVICE HAS VERBALLY REPORTED THAT THEY HAVE REQUESTED AN ENDANGERED SPECIES ACT, SECTION 7, CONSULTATION WITH THE NRC.

THERE HAS BEEN MEDIA INTEREST IN THIS EVENT. THE LICENSEE NOTIFIED THE NRC RESIDENT INSPECTOR. THE NRC OPERATIONS OFFICER NOTIFIED R2DO (PAUL DRICKSON).

(Continued on next page)

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* * * UPDATE AT 1000 ON 03/31/98 BY RICK SWEENEY ENTERED BY JOLLIFFE * * *

1830, 1930, & 2350 ON 03/30/98 AND 0800 & 0905 ON 03/31/98 THE LICENSEE FOUND DISTRESSED ENDANGERED KEMP'S RIDLEY SEA TURTLES AT THE PLANT INTAKE STRUCTURE. AT 0815 & 0935 ON 03/31/98, THE LICENSEE NOTIFIED FLORIDA DEP OF THIS DISCOVERY. THE LICENSEE TURNED ALL FIVE TURTLES OVER TO CLEARWATER MARINE SCIENCE CENTER PER THE DIRECTION OF FLORIDA DEP. THE LICENSEE IS CONTINUING TO WORK WITH FLORIDA DEP AND FWS TO DETERMINE THE REASON FOR THE INCREASED NUMBER OF DEAD AND DISTRESSED SEA TURTLES THAT HAVE BEEN FOUND AT THE CRYSTAL RIVER SITE DURING THE PAST FEW WEEKS.

THE LICENSEE WILL INFORM THE NRC RESIDENT INSPECTOR. THE NRC OPERATIONS OFFICER NOTIFIED THE R2DO PAUL FREDRICKSON.

*** UPDATE ON 4/1/98 @ 1903 BY HUEGEL TO GOULD ***

A NOTIFICATION WAS MADE TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) REGARDING THE MORTALITY OF SEA TURTLES WHICH IS LIKELY TO BE, IN PART, RELATED TO PLANT OPERATION. AN ONSITE MEETING WITH FLORIDA DEP WAS HELD TO DEVELOP BOTH SHORT TERM AND LONG MITIGATION PLANS. THE LICENSEE WILL CONTINUING TO WORK AND COMMUNICATE WITH FDEP.

THE RESIDENT INSPECTOR WAS INFORMED. THE REG 2 RDO(PEEBLES) WAS NOTIFIED.

POWER REACTOR

EVENT NUMBER: 33979

LITY: CRYSTAL RIVER
UNIT: [3] [ ] [ ]
RX TYPE: [3] B&W-L-LP

REGION: 2
STATE: FL

NOTIFICATION DATE: 03/27/98
NOTIFICATION TIME: 14:14 [ET]
EVENT DATE: 03/27/98
EVENT TIME: 00:00[EST]
LAST UPDATE DATE: 03/27/98

NRC NOTIFIED BY: R. RAWLS
HQ OPS OFFICER: BOB STRANSKY

NOTIFICATIONS

EMERGENCY CLASS: NOT APPLICABLE
10 CFR SECTION:
APRE 50.72(b)(2)(vi) OFFSITE NOTIFICATION

PAUL FREDRICKSON RDO

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
3	N	Y	100	POWER OPERATION	100	POWER OPERATION

EVENT TEXT

OFFSITE NOTIFICATION REGARDING INCREASED SEA TURTLE ACTIVITY NEAR THE SITE
ER TO EVENT #33988 FOR ADDITIONAL INFORMATION.)

THE LICENSEE HAS CONTACTED THE FLORIDA STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP) REGARDING INCREASED SEA TURTLE ACTIVITY NEAR THE PLANT INTAKE. OVER THE PAST SEVERAL MONTHS, THE LICENSEE HAS DISCOVERED THREE DEAD TURTLES IN THE INTAKE. HOWEVER, DURING THE PAST WEEK A MARKED INCREASE IN SEA TURTLE SIGHTINGS HAS OCCURRED, INCLUDING SIGHTINGS OF SEVERAL EXTREMELY RARE KEMP'S RIDLEY SEA TURTLES. THE STATE DEP HAS PROVIDED THE LICENSEE WITH INSTRUCTIONS FOR HANDLING THE TURTLES. THE CAUSE OF THE INCREASED TURTLE ACTIVITY IS UNKNOWN. THE LICENSEE AND THE STATE DEP ARE ASSESSING THE SITUATION AT THIS TIME.

THE LICENSEE INFORMED THE NRC RESIDENT INSPECTOR AND EXPECTS SOME MEDIA INTEREST IN THIS EVENT.

A/17

April 8, 1999

Mr. John Paul Cowan
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing (SA2A)
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

SUBJECT: DRAFT BIOLOGICAL OPINION REGARDING IMPACT TO SEA TURTLES AT THE CRYSTAL RIVER ENERGY COMPLEX (TAC NO. MA1706)

Dear Mr. Cowan:

By letter dated October 1, 1998, Florida Power Corporation (FPC) provided the U.S. Nuclear Regulatory Commission (NRC) a Biological Assessment (BA) of the impact on endangered sea turtles of operation of the Crystal River Energy Complex. The BA was prepared to support a Section 7 consultation under the Endangered Species Act. By letter dated October 14, 1998, the NRC provided the BA and our recommendation to the National Marine Fisheries Service (NMFS).

The NRC has received from NMFS a draft Biological Opinion (BO). The BO is enclosed for FPC review and comment. Please note that the document is no longer exempt from Freedom of Information Act requests, and comments on the draft BO are required to be in writing and sent to the NRC. The NRC will forward your comments along with ours to the NMFS. Due to the NMFS schedule for issuance of the final BO, we request you provide comments within 30 working days of receipt of this letter.

Please contact me at (301) 415-1495 or Ms. Cynthia Sochor at (301) 415-2462 if you have any questions regarding this matter.

Sincerely,
Original signed by:
Leonard A. Wiens, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-302

Enclosure: As stated
cc w/encl: See next page
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A/18

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 8, 1999

Mr. John Paul Cowan
Vice President, Nuclear Operations
Florida Power Corporation
ATTN: Manager, Nuclear Licensing (SA2A)
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

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Leonard A. Wiens, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-302

Enclosure: As stated

cc w/encl: See next page

Mr. John Paul Cowan
Florida Power Corporation

cc:
Mr. R. Alexander Glenn
Corporate Counsel
Florida Power Corporation
MAC-A5A
P.O. Box 14042
St. Petersburg, Florida 33733-4042

Mr. Charles G. Pardee, Director
Nuclear Plant Operations (NA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Mr. Michael A. Schoppman
Framatome Technologies Inc.
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Mr. William A. Passetti, Chief
Department of Health
Bureau of Radiation Control
2020 Capital Circlel, SE, Bin #C21
Tallahassee, Florida 32399-1741

Attorney General
Department of Legal Affairs
The Capitol
Tallahassee, Florida 32304

Mr. Joe Myers, Director
Division of Emergency Preparedness
Department of Community Affairs
2740 Centerview Drive
Tallahassee, Florida 32399-2100

Chairman
Board of County Commissioners
Citrus County
110 North Apopka Avenue
Inverness, Florida 34450-4245

Ms. Sherry L. Bernhoft, Director
Nuclear Regulatory Affairs (SA2A)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Senior Resident Inspector
Crystal River Unit 3
U.S. Nuclear Regulatory Commission
6745 N. Tallahassee Road
Crystal River, Florida 34428

Mr. Gregory H. Halnon
Director, Quality Programs (SA2C)
Florida Power Corporation
Crystal River Energy Complex
15760 W. Power Line Street
Crystal River, Florida 34428-6708

Endangered Species Act - Section 7 Consultation
DRAFT
Biological Opinion

Agency:	United States Nuclear Regulator Commission
Activity:	Cooling water intake system at the Crystal River Energy Complex
Consultation Conducted By:	National Marine Fisheries Service, Southeast Region

I. History of the Consultation

This consultation was initiated by the Nuclear Regulatory Commission (NRC) by a letter dated October 14, 1998, with an attached biological assessment (BA); received by the National Marine Fisheries Service (NMFS), Southeast Regional Office (SERO), Protected Resources Division on October 22, 1998. The BA analyzes the effects of the cooling water system on species of sea turtles protected by the Endangered Species Act (ESA), at the Crystal River Energy Complex (CREC). This biological opinion is based on information provided in the biological assessment; various telephone conversations and a May 13, 1998 meeting involving NMFS SERO, Florida Power Corporation (FPC), and NRC staff; an April 23, 1998 site visit by Mr. David Bernhart and Ms. Colleen Coogan of the SERO; a March 24, 1999 site visit by Mr. Bob Hoffman of the SERO; and other sources of information. A complete administrative record of this consultation is on file at the NMFS Southeast Regional Office.

II. Description of the Proposed Action

Action Area

The CREC is located on an approximate 5,000 acre site near the Gulf of Mexico in Citrus County, Florida. The Complex is approximately 7.5 miles northwest of the city of Crystal River, within the coastal salt marsh area of west central Florida. The action area consists of 3 of the 5 power plantsthat make up CREC, the 2.8 mile discharge canal, intake canal, and intake structures, which includes the bar racks, traveling screens, and sea water pump components. The intake canal is a dredged canal approximately 14 miles long with an average depth of 20 feet. The canal is bordered on both sides by land beginning from the plant site and extending 3 miles to the west. The canal then extends westward an additional 11 miles out into the Gulf of Mexico.

The Proposed Action

The CREC contains five separate power plants. Unit 1 is an approximately 400MW electric (MWe) coal-fueled plant. Unit 2 is an approximately 500 MWe coal-fueled plant. Unit 3 is an approximately 890 MWe pressurized water, nuclear-fueled plant. Units 4 and 5 are two coal-fueled plants at approximately 640 MWe each.

The intake structures of the power plants are concrete structures with bar racks, traveling screens, and seawater pump components. Surface water trash barriers are deployed in front of the bar racks to collect large floating debris. Water is drawn from the intake canal through the bar racks, through the traveling screens, into the pumps and flows through the plants condensers and auxiliary systems. The water is then discharged through an outfall into the discharge canal. The discharge canal directs to water back to the Gulf of Mexico.

The intake bar racks prevent trash and large debris carried by the seawater from entering the intake structure. The seawater must pass through the bar racks which are made of steel bars spaced on 4 inch centers. The bar racks extend from well above the water line to the concrete base at the bottom of the intake canal. Debris and marine life smaller than the bar rack openings pass through the bar racks. The traveling screens effectively remove this floating or suspended debris from the intake water. Intake water passes through these screens, which suspend debris and solid materials onto the screens. The screens are conveyed upwards to an overlapping water spray system which washes these materials off the screens and into a debris trough. The traveling screen system is operated approximately three times a day.

Each of the three plants that use seawater to cool, have four large circulating pumps used to draw seawater into the plant. The water is then pumped through the condensers and out to the discharge canal. On units 1 and 2, the total design flow is 638,000 gallons per minute (g.p.m). Unit 3 design flow is 680,000 g.p.m. In addition, unit 3 has a low flow nuclear services water pumping system with a normal flow rate of approximately 10,000 g.p.m. Under emergency conditions, additional pumps would increase this flow up to approximately 20,000 g.p.m. From the discharge of the pumps the water flows to the main condensers; and for unit 3, an additional flow path exists for the nuclear services and decay heat cooling water heat exchangers. After the seawater passes through the tubes of the condenser and/or heat exchangers, the seawater is transported in underground pipes to the discharge canal. The discharge canal directs the water back to the Gulf of Mexico.

The bar racks are inspected 24 hours a day during times of high turtle concentrations in the intake canal (February through May) and once every two hours during other times of the year. If a turtle is stranded on the bar racks it is immediately recovered with dip nets. Healthy turtles are placed in a holding tank at the CREC Mariculture Center, where Mariculture Center Staff members determine the proper disposition of the turtle, in conjunction with Florida Department of Environmental Protection (FDEP) personnel. Non-healthy turtles are also taken to the Mariculture Center with disposition to be determined by FDEP. Dead turtles are sent to the Mariculture Center and picked up by FDEP.

III. Status of Listed Species and Critical Habitat

The following listed species under the jurisdiction of NMFS are known to occur in the Gulf of Mexico:

Endangered

Green sea turtle	*Chelonia mydas*
Leatherback sea turtle	*Dermochelys coriacea*
Hawksbill sea turtle	*Eretmochelys imbricata*
Kemp's ridley sea turtle	*Lepidochelys kempii*

Sperm whales (*Physeter macrocephalus*), occur in the Gulf of Mexico but are rare in state waters. Other endangered whales, including North Atlantic right whales (*Eubalaena glacialis)* and humpback whales (*Megaptera novaengliae*), have been observed occasionally in the Gulf of Mexico. The individuals observed have likely been inexperienced juveniles straying from the normal range of these stocks. NMFS does not believe that there are resident stocks of these species in the Gulf of Mexico, and these species are not likely to be adversely affected by projects in the Gulf.

Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

Threatened

Loggerhead sea turtle	*Caretta caretta*
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*

No critical habitat for listed species under the jurisdiction of NMFS has been designated in the Gulf of Mexico.

Biology and Distribution

Sea Turtles

Five species of sea turtles occur in Gulf of Mexico waters. Kemp's ridley and loggerhead turtles are the most common turtle species found in the Gulf as evidenced by strandings. However leatherbacks are not uncommon and hawksbill and green turtles occur regularly within stranding and incidental capture records. Historical accounts of the occurrence of sea turtles in Texas, Louisiana and Florida waters are consistent with current observations, although fluctuations in populations are apparent (Fuller, 1978, Cox and Mauermann, 1978, and Fuller and Tappan, 1986). Commercial fisheries remain the major known direct cause of sea turtle takes.

Green turtle (*Chelonia mydas*)

Green turtles are distributed circumglobally, mainly in waters between the northern and southern 20°C isotherms (Hirth, 1971). Green turtles were traditionally highly prized for their flesh, fat, eggs, and shell, and fisheries in the United States and throughout the Caribbean are largely to blame for the decline of the species.

In the western Atlantic, several major nesting assemblages have been identified and studied (Peters, 1954; Carr and Ogren, 1960; Parsons, 1962; Pritchard, 1969; Carr *et al.*, 1978). In the continental United States, green turtle nesting occurs on the Atlantic Coast of Florida (Ehrhart, 1979). Occasional nesting has been documented along the Gulf Coast of Florida, at Southwest Florida beaches, as well as the beaches of the Eglin Air Force Base on the Florida Panhandle (Meylan *et al., 1995*). Most documented green turtle nesting activity occurs on Florida index beaches, which were established to standardize data collection methods and effort on key nesting beaches. The pattern of green turtle nesting shows biennial peaks in abundance, with

a generally positive trend during the six years of regular monitoring since establishment of the index beaches in 1989 and for which data have been published, perhaps due to increased protective legislation throughout the Caribbean (Meylan *et al.*, 1995).

While nesting activity is obviously important in identifying population trends and distribution, the major portion of a green turtle's life is spent on the foraging grounds. Green turtles are herbivores, and appear to prefer marine grasses and algae in shallow bays, lagoons and reefs (Rebel, 1974). Some of the principal feeding pastures in the Gulf of Mexico include inshore south Texas waters, the upper west coast of Florida and the northwestern coast of the Yucatan Peninsula. Additional important foraging areas in the western Atlantic include the Indian River Lagoon System in Florida, Florida Bay, the Culebra archipelago and other Puerto Rico coastal waters, the south coast of Cuba, the Mosquito coast of Nicaragua, the Caribbean coast of Panama, and scattered areas along Colombia and Brazil (Hirth, 1971). The preferred food sources in these areas are *Cymodocea, Thalassia, Zostera, Sagittaria, and Vallisneria* (Babcock 1937; Underwood, 1951; Carr, 1952; 1954).

Green turtles were once abundant enough in the shallow bays and lagoons of the Gulf to support a commercial fishery, which landed over one million pounds of green turtle in 1890 (Doughty, 1984). Doughty (1984) reported the decline in the turtle fishery throughout the Gulf of Mexico by 1902. Currently, green turtles are uncommon in offshore waters of the northern Gulf, but abundant in some inshore embayments. Shaver (1994) live-captured a number of green turtles in channels entering into Laguna Madre, in South Texas. She noted the abundance of green turtle strandings in Laguna Madre inshore waters and opined that the turtles may establish residency in the inshore foraging habitats as juveniles. Algae along the jetties at entrances to the inshore waters of South Texas was thought to be important to green turtles associated with a radio-telemetry project (Renaud *et al.*, 1995). Transmitter-equipped turtles remained near jetties for most of the tracking period. This project was restricted to late summer months, and therefore may reflect seasonal influences. Coyne (1994) observed increased movements of green turtles during warm water months.

Hawksbill turtle (*Eretmochelys imbricata*)

The hawksbill turtle is relatively uncommon in the waters of the continental United States, preferring coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges but also consume bryozoans, coelenterates, and mollusks. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills on the reefs of south Florida, and a surprising number of small hawksbills are encountered in Texas. Most of the Texas records are probably in the 1-2 year class range. Many of the individuals captured or stranded are unhealthy or injured (Hildebrand, 1983). The lack of sponge-covered reefs and the cold winters in the northern Gulf of Mexico probably prevent hawksbills from establishing a strong presence in this area.

Leatherback turtle (*Dermochelys coriacea*)

The Recovery Plan for Leatherback Turtles (*Dermochelys coriacea*) contains a description of the natural history and taxonomy of this species (USFWS and NMFS, 1992). Leatherbacks are widely distributed throughout the oceans of the world, and are found throughout waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour, 1972). Leatherbacks are predominantly distributed pelagically, feeding primarily on jellyfish such as *Stomolophus, Chryaora*, and *Aurelia* (Rebel, 1974). They may come

into shallow waters if there is an abundance of jellyfish nearshore. Leary (1957) reported a large group of up to 100 leatherbacks just offshore of Port Aransas, Texas associated with a dense aggregation of *Stomolophus*.

The status of the leatherback population is the most difficult to assess since major nesting beaches occur over broad areas within tropical waters outside the United States. The primary leatherback nesting beaches occur in French Guiana and Suriname in the western Atlantic and in Mexico in the eastern Pacific. Although increased observer effort on some nesting beaches has resulted in increased reports of leatherback nesting, declines in nest abundance have been reported from the beaches of greatest nesting densities. At Mexiquillo, Michoacan, Mexico, Sarti *et al.* (1996) reported an average annual decline in leatherback nesting of about 23% between 1984 and 1996. The total number of females nesting on the Pacific coast of Mexico during the 1995-1996 season was estimated at fewer than 1000. The major western Atlantic nesting area for leatherbacks is located in the Suriname-French Guiana trans-boundary region. Chevalier and Girondot (1998) report that combined nesting in the two countries has been declining since 1992. Some nesting occurs on Florida's east coast, although nests are likely under-reported because surveys are not conducted during the entire period that leatherbacks may nest. In the eastern Caribbean, nesting occurs primarily in the Dominican Republic, the Virgin Islands, and on islands near Puerto Rico. Sandy Point, on the western edge of St. Croix, Virgin Islands, has been designated by the U.S. Fish and Wildlife Service (USFWS) as critical habitat for nesting leatherback turtles. Anecdotal information suggests nesting has declined at Caribbean beaches over the last several decades (NMFS and USFWS, 1995).

Kemp's Ridley (*Lepidochelys kempii*)

Of the seven extant species of sea turtles of the world, the Kemp's ridley has declined to the lowest population level. The Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) (USFWS and NMFS, 1992b) contains a description of the natural history, taxonomy, and distribution of the Kemp's or Atlantic ridley turtle. Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico. Most of the population of adult females nest in this single locality (Pritchard, 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand, 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid 1980s. Recent observations of increased nesting, discussed below, suggest that the decline in the ridley population has stopped, and there is cautious optimism that the population is now increasing.

The nearshore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile Kemp's ridley and loggerhead sea turtles. Ogren (1988) suggests that the Gulf Coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. Stomach contents of Kemp's ridleys along the lower Texas coast had a predominance of nearshore crabs and mollusks, as well as fish, shrimp and other foods considered to be shrimp fishery discards (Shaver, 1991). Analyses of stomach contents from sea turtles stranded on upper Texas beaches apparently suggest similar nearshore foraging behavior (Plotkin, pers comm).

Research being conducted by Texas A&M University has resulted in the intentional live-capture of 100's of Kemp's ridleys at Sabine Pass and the entrance to Galveston Bay. Between 1989 and 1993, 50 of the Kemp's

ridleys captured were tracked by biologists with the NMFS Galveston Laboratory using satellite and radio telemetry. The tracking study was designed to characterize sea turtle habitat and to identify small- and large-scale migration patterns. Preliminary analysis of the data collected during these studies suggests that subadult Kemp's ridleys stay in shallow, warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud, NMFS Galveston Laboratory, pers. comm.).

In recent years, unprecedented numbers of Kemp's ridley carcasses have been reported from Texas and Louisiana beaches during periods of high levels of shrimping effort. NMFS established a team of population biologists, sea turtle scientists and managers, known as the Expert Working Group (EWG) to conduct a status assessment of sea turtle populations. Analyses conducted by the group have indicated that the Kemp's ridley population is in the early stages of recovery; however, strandings in some years have increased at rates higher than the rate of increase in the Kemp's population (Expert Working Group, June 1996). While many of the stranded turtles observed in recent years in Texas and Louisiana are believed to have been incidentally taken in the shrimp fishery, other sources of mortality exist in these waters. These stranding events illustrate the vulnerability of Kemp's ridley and loggerhead turtles to the impacts of human activities in nearshore Gulf of Mexico waters.

The EWG focused on determining population estimates for Kemp's ridley and loggerhead sea turtles, the species of greatest concern in the Gulf of Mexico due to high historical incidental take levels in the shrimp fishery. Internal reports submitted by the EWG, entitled "Kemp's ridley (*Lepidochelys kempii*) Sea Turtle Status Report" dated June 28, 1996 and the "Status of the Loggerhead Turtle Population (*Caretta caretta*) in the Western North Atlantic" dated July 1, 1996, were submitted in early July of 1996.

The EWG developed a population model to evaluate trends in the Kemp's ridley population through the application of empirical data and life history parameter estimates chosen by the EWG. Model results identified three trends in benthic immature Kemp's ridleys. Benthic immatures are those turtles that are not yet reproductively mature but have recruited to feed in the nearshore benthic environment, where they are available to nearshore mortality sources that often result in strandings. Benthic immature ridleys are estimated to be 2-9 years of age and 20-60 cm in length. Increased production of hatchlings from the nesting beach beginning in 1966 resulted in an increase in benthic ridleys that leveled off in the late 1970s. A second period of increase followed by leveling occurred between 1978 and 1989 as hatchling production was further enhanced by the cooperative program between the USFWS and Mexico's Instituto Nacional de Pesca (INP) to increase the nest protection and relocation program in 1978. A third period of steady increase, which has not leveled off to date, has occurred since 1990 and appears to be due to the greatly increased hatchling production and an apparent increase in survival rates of immature turtles beginning in 1990 due, in part, to the introduction of TEDs.

The EWG was unable to estimate the total population size and current mortality rates for the Kemp's ridley population. However, they listed a number of preliminary conclusions. They indicated that the Kemp's ridley population appears to be in the early stage of exponential expansion. Over the period 1987 to 1995, the rate of increase in the annual number of nests accelerated in a trend that would continue with enhanced hatchling production and the use of turtle excluder devices. Nesting data indicated that the number of adults declined from a population that produced 6,000 nests in 1966 to a population that produced 924 nests in 1978 and a low of 702 nests in 1985. This trajectory of adult abundance tracks trends in nest abundance from an estimate

of 9,600 in 1966 to 1,050 in 1985. The EWG estimated that in 1995 there were 3000 adult ridleys. The increased recruitment of new adults is illustrated in the proportion of neophyte, or first time nesters, which has increased from 6% to 28% from 1981 to 1989 and from 23% to 41% from 1990 to 1994. The EWG's population model projected that Kemp's ridleys could reach the intermediate recovery goal identified in the Recovery Plan, of 10,000 nesters by the year 2020 if the assumptions of age to sexual maturity and age specific survivorship rates plugged into their model are correct. They determined that the data they reviewed suggested that adult Kemp's ridley turtles were restricted somewhat to the Gulf of Mexico in shallow near shore waters, and benthic immature turtles of 20-60 cm straight line carapace length are found in nearshore coastal waters including estuaries of the Gulf of Mexico and the Atlantic.

The EWG identified an average Kemp's ridley population growth rate of 13% per year between 1991 and 1995. Total nest numbers have continued to increase. However, the 1996 and 1997 nest numbers reflected a slower rate of growth, while the increase in the 1998 nesting level has been much higher. The population growth rate does not appear as steady as originally forecasted by the EWG, but annual fluctuations, due in part to irregular interesting periods, are normal for other sea turtle populations.

The area surveyed for ridley nests in Mexico was expanded in 1990 due to destruction of the primary nesting beach by Hurricane Gilbert. The EWG assumed that the increased nesting observed particularly since 1990 was a true increase, rather than the result of expanded beach coverage. Because systematic surveys of the adjacent beaches were not conducted prior to 1990, there is no way to determine what proportion of the nesting increase documented since that time is due to the increased survey effort rather than an expanding ridley nesting range. As noted by the EWG, trends in Kemp's ridley nesting even on the Rancho Nuevo beaches alone suggest that recovery of this population has begun but continued caution is necessary to ensure recovery and to meet the goals identified in the Kemp's ridley Recovery Plan.

Loggerhead Sea Turtles (*Caretta caretta*)

The threatened loggerhead is the most abundant species of sea turtle occurring in U.S. waters. The nearshore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile loggerheads. Studies conducted on loggerheads stranded on the lower Texas coast (south of Matagorda Island) have indicated that stranded individuals were feeding in nearshore waters shortly before their death (Plotkin *et al.*, 1993).

The EWG identified four nesting subpopulations of loggerheads in the western North Atlantic based on mitochondrial DNA evidence. These include: (1) the Northern subpopulation producing approximately 6,200 nests/year from North Carolina to Northeast Florida; (2) the South Florida subpopulation occurring from just north of Cape Canaveral on the east coast of Florida and extending up to Naples on the west coast and producing approximately 64,000 nests/year; (3) the Florida Panhandle subpopulation, occurring at Eglin Air Force Base and the beaches near Panama City and producing approximately 450 nests/year; and (4) the Yucatan subpopulation occurring on the northern and eastern Yucatan Peninsula in Mexico and producing approximately 1,500-2,000 nests/year.

Genetic analyses of benthic immature loggerheads collected from Atlantic foraging grounds identify a mix of the east coast subpopulations that is disproportionate to the number of hatchlings produced in these nesting assemblages. Although the northern nesting subpopulation produces only approximately 9% of the

loggerhead nests, loggerheads on foraging grounds from the Chesapeake Bay to Georgia are nearly equally divided in origin between the two subpopulations (Sears, 1994; Sears *et al.*, 1995; Norrgard, 1995). Of equal interest, 57% of the immature loggerheads sampled in the Mediterranean were from the South Florida subpopulation, while only 43% were from the local Mediterranean nesting beaches (Laurent *et al.*, 1993; Bowen, 1995). Genetic work has not yet been done on nesting or foraging loggerheads in the Gulf of Mexico.

The EWG considered nesting data collected from index nesting beaches to index the population size of loggerheads and to consider trends in the size of the population. They constructed total estimates by considering a ratio between nesting data (and associated estimated number of adult females and therefore adults in nearshore waters), proportion of adults represented in the strandings, and in one method, aerial survey estimates. These two methods indicated that for the 1989-1995 period, there were averages of 224,321 or 234,355 benthic loggerheads, respectively. The EWG listed the methods and assumptions in their report, and suggested that these numbers are likely underestimates. Aerial survey results suggest that loggerheads in U.S. waters are distributed in the following proportions: 54% in the Southeast U.S. Atlantic, 29% in the northeast U.S. Atlantic, 12% in the eastern Gulf of Mexico, and 5% in the western Gulf of Mexico.

The EWG considered long-term index nesting beach datasets when available to identify trends in the loggerhead population. Overall, they determined that trends could be identified for two loggerhead subpopulations. The Northern subpopulation appears to be stabilizing after a period of decline; the South Florida subpopulation appears to have shown significant increases over the last 25 years suggesting the population is recovering, although the trend could not be detected over the most recent 7 years of nesting. An increase in the numbers of adult loggerheads has been reported in recent years in Florida waters without a concomitant increase in benthic immatures. These data may forecast limited recruitment to south Florida nesting beaches in the future. Since loggerheads take approximately 20-30 years to mature, the effects of decline in immature loggerheads might not be apparent on nesting beaches for decades. Therefore the EWG cautions against considering trends in nesting too optimistically.

Briefly, the EWG made a number of conclusions regarding the loggerhead population. They concluded that four distinct nesting populations exist based on genetic evidence, although separate management is not possible because of insufficient information on the in-water distribution of each subpopulation. They concluded that the recovery goal of more than 12,800 nests for the Northern subpopulation was not likely to be met. Currently, nests number about 6,200 and no perceptible increase has been documented. The recovery goal or "measurable increases" for the South Florida subpopulation (south of Canaveral and including Southwest Florida) appears to have been met, and this population appears to be stable or increasing. However, index nesting surveys have been done for too short a time, therefore it is difficult to evaluate trends throughout the region. Recovery rates for the entire subpopulation cannot be determined with certainty at this time. However, caution is warranted because, although nesting activity has been increasing, catches of benthic immature turtles at the St. Lucie Nuclear Power Plant intake canal, which acts as a passive turtle collector on Florida's east coast, have not been increasing. The EWG recommended establishing index nest survey areas in the Gulf of Mexico to monitor those populations, which do not currently have recovery goals assigned to them.

Fish

Gulf Sturgeon (*Acipenser oxyrinchus desotoi*)

Detailed information regarding the life history, abundance and distribution of Gulf sturgeon can be found in the Gulf Sturgeon Recovery/Management Plan (FWS and GSMFC, 1995). Gulf sturgeon were listed as threatened in 1991, and are under the joint jurisdiction of the Fish and Wildlife Service and NMFS. Historically, Gulf sturgeon occurred in most major rivers between the Mississippi and the Suwannee, and in marine waters from the Mississippi to Florida Bay. While little is known about the abundance of Gulf sturgeon through most of its range, estimates exist for the Suwannee and Apalachicola rivers. The FWS (1990, 1991, 1992 in FWS & GSMFC, 1995) reported an average of 115 individuals larger than 45 cm total length over-summering in the Apalachicola River below Jim Woodruff Lock and Dam. For the Suwannee River, population size estimates ranging from 2,250 to 3,300 individuals have been made (Carr and Rago, unpublished data in FWS & GSMFC, 1995).

There is sparse information available regarding the distribution of Gulf sturgeon in the marine environment. A few takes incidental to commercial and recreational fishing have been documented offshore of Louisiana, in the Mississippi Sound and Biloxi Bay, Pensacola Bay, Apalachicola Bay, Tampa Bay and Charlotte Harbor. Although biotelemetry studies geared toward identifying the movements of sturgeon once they have entered marine waters have been conducted, little information has been developed yet. Gulf sturgeon likely leave riverine waters in the late fall to early winter to forage in the marine or estuarine environment for benthic invertebrates over mud and sand bottoms and seagrass communities, and return to the rivers in the spring.

Directed and incidental take in fisheries and habitat loss have been identified as the major threats to the recovery of Gulf sturgeon.

Analysis of the Species Likely to be Affected

Of the above listed species occurring in the eastern Gulf of Mexico, NMFS believes that the five species of sea turtle are likely to be adversely affected by the proposed action. NMFS believes that the Gulf sturgeon and listed species of large whales are not likely to be adversely affected by the proposed action. Although the Gulf sturgeon's migratory habits are not well known, NMFS believes it is unlikely that Gulf sturgeon will stray from mud and sand bottom marine foraging areas in the Gulf to enter the rocky bottomed intake canal of the CREC and be affected by the cooling water intake system. Species of large whales are not likely to occur in the inshore shallow waters by the intake canal. The remainder of the analysis in this biological opinion will focus on the five species of sea turtles.

IV. Environmental Baseline

Status of the Species Within the Action Area

The five species of sea turtles that occur in the action area are all highly migratory. The offshore waters of the eastern Gulf may be used by these species as post-hatchling developmental habitat, foraging habitat, or migratory pathways. NMFS believes that no individual members of any of the species are likely to be year-round residents of the action area. Individual animals will make migrations into nearshore waters as well as

other areas of the Gulf of Mexico, Caribbean Sea, and North Atlantic Ocean. Therefore, the range-wide status of the species, given in Section II above, most appropriately reflects the species status within the action area.

Factors Affecting the Species Within the Action Area

The offshore waters of the eastern Gulf of Mexico remain relatively free of human activities that impact listed species of sea turtles. The only Federal action in the action area impacting these species, whose effects have been previously considered in a biological opinion, is the pelagic fishery for swordfish, tuna, and shark. As discussed above, however, sea turtles are not strict residents of the action area and may be affected by human activities throughout their migratory range. Therefore, this section will discuss the impacts of Federal actions on sea turtles throughout the Gulf of Mexico and western North Atlantic.

Federally-regulated commercial fishing operations represent the major human source of sea turtle injury and mortality in U.S. waters. Shrimp trawlers in the southeastern U.S. are required to use TEDs, which reduce a trawler's capture rate by 97%. Even so, NMFS estimated that 4,100 turtles may be captured annually by shrimp trawling, including 650 leatherbacks that cannot be released through TEDs, 1,700 turtles taken in try nets, and 1,750 turtles that fail to escape through the TED (NMFS, 1998). Henwood and Stuntz (1987) reported that the mortality rate for trawl-caught turtles ranged between 21% and 38%, although Magnuson *et al.* (1990) suggested Henwood and Stuntz's estimates were very conservative and likely an underestimate of the true mortality rate. The mid-Atlantic and Northeast fishery for summer flounder, scup, and black sea bass uses otter trawl gear that also captures turtles. Summer flounder trawlers fishing south of Cape Henry, Virginia (south of Oregon Inlet, North Carolina from January 15 to March 15) are required to use TEDs. Participants in this fishery who use a type of trawl known as a flynet, however, are not required to use TEDs, as TEDs for flynets have not been researched and NMFS is collecting further observer information on turtle bycatch by flynet vessels. The estimated, observed annual take rates for turtles in this multispecies fishery is 15 loggerheads and 3 leatherbacks, hawksbills, greens, or Kemp's ridley, in combination (NMFS, 1996a). The pelagic fishery for swordfish, tuna, and shark, which is prosecuted over large areas of the northwestern Atlantic and the Gulf of Mexico, including the action area, also has a fairly large bycatch of sea turtles. NMFS (1997b) estimated that the longline component of this fishery would annually take, through hooking or entanglement, 690 leatherbacks, 1,541 loggerheads, 46 green, and 23 Kemp's ridley turtles, with a projected mortality rate of 30%. In the driftnet component of the fishery, estimated annual levels of injury or mortality are 40 leatherbacks, 58 loggerheads, 4 Kemp's ridleys, 4 greens, and 2 hawksbills.

Military activities, including vessel operations and ordnance detonation, also affect listed species of sea turtles. U.S. Navy aerial bombing training in the ocean off the southeast U.S. coast, involving drops of live ordnance (500 and 1,000-lb bombs) is estimated to injure or kill, annually, 84 loggerheads, 12 leatherbacks, and 12 greens or Kemp's ridley, in combination (NMFS, 1997a). The U.S. Navy will also conduct ship-shock testing for the new SEAWOLF submarine off the Atlantic coast of Florida, using 5 submerged detonations of 10,000 lb explosive charges. This testing is estimated to injure or kill 50 loggerheads, 6 leatherbacks, and 4 hawksbills, greens, or Kemp's ridleys, in combination (NMFS, 1996b). The U.S. Coast Guard's operation of their boats and cutters, meanwhile, is estimated to take no more than one individual turtle – of any species – per year (NMFS, 1995). Formal consultation on Coast Guard or Navy activities in the Gulf of Mexico has not been conducted.

The construction and maintenance of Federal navigation channels has also been identified as a source of turtle mortality. Hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move relatively rapidly and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. Along the Atlantic Coast of the southeastern United States, NMFS estimates that annual, observed injury or mortality of sea turtles from hopper dredging may reach 35 loggerheads, 7 greens, 7 Kemp's ridleys, and 2 hawksbills (NMFS, 1997c). Along the north and west coasts of the Gulf of Mexico, channel maintenance dredging using a hopper dredge may injure or kill 30 loggerhead, 8 green, 14 Kemp's ridley, and 2 hawksbill sea turtles annually (NMFS, 1997d).

Sea turtles entering coastal or inshore areas have been affected by entrainment in the cooling-water systems of electrical generating plants. At the St. Lucie nuclear power plant at Hutchinson Island, Florida, large numbers of green and loggerhead turtles have been captured in the seawater intake canal in the past several years. Annual capture levels from 1994-1997 have ranged from almost 200 to almost 700 green turtles and from about 150 to over 350 loggerheads. Almost all of the turtles are caught and released alive; NMFS estimates the survival rate at 98.5% or greater (1997e). Other power plants in south Florida, west Florida, and North Carolina have also reported low levels of sea turtle entrainment, but formal consultation on these plants' operations has not been completed.

Sea turtles are vulnerable to blast injury and death from the use of underwater explosives. Klima *et al.* (1988) reported a dramatic elevation in the number of sea turtle strandings along the north Texas coast, coinciding with a large number of explosive removals of offshore oil platforms in the area. Since then, protective measures implemented by NMFS, the Corps of Engineers, and the Minerals Management Service, including required observers at explosive rig-removals, have been effective in minimizing the impacts of explosive rig-removals on sea turtles. From 1987 to 1997, a total of 1,013 platform removals took place with NMFS observers present. Sea turtles were observed at 112 of those sites, and two loggerhead turtles were recovered injured after blasting. Those animals were rehabilitated and released. In 1998, one loggerhead has been killed as a result of rig-removal blasting. Although some mortality may occur and go undetected, the overall number of turtles impacted by rig-removal actions has been very low since the adoption of protective measures.

V. Effects of the Action

Since units 1, 2, and 3 began commercial operation, marine turtles have occasionally been found in the intake canal. CREC records indicate that from 1994 to 1997, eight sea turtles were stranded on the unit 3 intake bar racks. CREC records for these years do not indicate species, time of year, size or disposition of the stranded turtles (dead or alive). Sea turtle monitoring activities at CREC have increased substantially since 1997 with the monitoring program implemented in March of 1998 and the implementation of the Sea Turtle Rescue Guidelines dated Sept 1998. The increased monitoring may increase take numbers as turtles that may have been missed in previous years are added into the take numbers for a given year.

The number of sea turtle sightings in the intake canal and strandings of the bar racks increased dramatically in 1998. The majority of these were Kemp's ridley sea turtles. In February 1998, 2 sea turtles were found stranded on the bar racks. These turtles were released alive. During March 1998 an additional 19 turtles were stranded on the unit 3 bar rack and released alive. Four mortalities were discovered floating in the

intake canal. CREC considers these four mortalities not causally related to plant operations since they were found upstream of the power plant intake structures. CREC considers it highly unlikely that a turtle mortality related to power plant operations could float against the incoming water current and by pass the surface trash boom structures.

In April, 1998 an additional 14 stranded sea turtles were released alive and 7 mortalities found. Four of these mortalities were found on the bar racks while the other 3 were found floating upstream of the intake structure. For the reasons described above CREC does not consider these three mortalities to be caused by plant operations. In May, 1998 a total of 4 sea turtles were stranded on the bar racks at unit 3 and released, 2 moralities were recovered, one at unit 3 and the other was seen floating in the canal and finally recovered near the intakes for units 1 and 2. This mortality had evidence of a boat collision. During June and July no sea turtles were stranded at CREC. During August 1998, one live sub-adult green turtle was removed from the bar racks of units 1 and 2. This turtle was considered severely debilitated by fibropapillomatosis and was transferred, under the direction of the Florida Department of Environmental Protection (FDEP), to the Clearwater Marine Science Center for rehabilitation.

NMFS agrees with the BA that dead turtles floating in the canal are not causally related to plant operations for the reasons stated above. NMFS also believes that severely decomposed turtles found on the bar racks are also not causally related to plant operations as the bar racks are continually monitored on a daily basis for turtle strandings. Therefore dead sea turtles not considered causally related to plant operations and verified by the FDEP are not considered taken by CREC.

The records indicate that this activity has not taken many sea turtles for years up to 1998. For the four years from 1994 to 1997 the activities at CREC have taken an average of two sea turtles per year. Records for 1998 show a dramatic increase in the numbers of sea turtle strandings at CREC, especially for the months of February to May. In 1998 a total of 44 takes were attributed to plant operations 5 being lethal. Of these 37 of the turtles released alive were Kemp's ridley and all 5 lethal takes were also Kemp's ridley. All sea turtles stranded at CREC were sub-adults with carapace lengths ranging from 21 cm to 55 cm. There are no proven environmental factors that have caused this increase and population numbers are not monitored for this area so the increase could be from an increase in population or an increase in sub-adult turtles moving into this area from some other area (personal communication with Allen Foley, FDEP). According to CREC personnel there has been 4 Kemp's ridley sub-adult turtles released alive from the bar racks at unit 3, from January to March of 1999. Thus far this rate of take is less than this time in 1998, and is considered comparable to other years excluding 1998.

Based on this information, and the fact that another anomalous year such as 1998 is possible, NMFS believes that the level of live take of sea turtles in BSEP's intake canal may reach 50 sea turtles rescued alive from the bar racks biannually and 5 lethal takes, biannually that are causally related to plant operations.

VI. Cumulative Effects

Cumulative effects are the effects of future state, local, or private activities that are reasonably certain to occur within the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. Within the action area, major future developments in human activities, that are not

part of a Federal action, are not anticipated. Because the action area is entirely within the Exclusive Economic Zone, new activities such as natural resource extraction/harvest would be subject to Federal review and/or regulation. As discussed in Section III, however, listed species of turtles migrate throughout the Gulf of Mexico and may be affected during their life cycles by non-Federal activities outside the action area.

Throughout the coastal Gulf of Mexico, but particularly in Louisiana, the loss of thousands of acres of wetlands is occurring due to natural subsidence and erosion, as well as reduced sediment input from the Mississippi River. Impacts caused by residential, commercial, and agricultural developments appear to be the primary causes of wetland loss in Texas.

Oil spills from tankers transporting foreign oil, as well as the illegal discharge of oil and tar from vessels discharging bilge water will continue to affect water quality in the Gulf of Mexico. Cumulatively, these sources and natural oil seepage contribute most of the oil discharged into the Gulf of Mexico. Floating tar sampled during the 1970s, when bilge discharge was still legal, concluded that up to 60% of the pelagic tars sampled did not originate from the northern Gulf of Mexico coast.

Marine debris will likely persist in the action area in spite of MARPOL prohibitions. In Texas and Florida, approximately half of the stranded turtles examined have ingested marine debris (Plotkin and Amos, 1990 and Bolten and Bjorndal, 1991). Although fewer individuals are affected, entanglement in marine debris may contribute more frequently to the death of sea turtles.

Coastal runoff and river discharges carry large volumes of petrochemical and other contaminants from agricultural activities, cities and industries into the Gulf of Mexico. The coastal waters of the Gulf of Mexico have more sites with high contaminant concentrations than other areas of the coastal United States, due to the large number of waste discharge point sources. Although these contaminant concentrations do not likely affect the more pelagic waters of the action area, the species of turtles analyzed in this biological opinion travel between nearshore and offshore habitats and may be exposed to and accumulate these contaminants during their life cycles.

State-regulated commercial and recreational fishing activities in the Gulf of Mexico waters take endangered species. These takes are not reported and are unauthorized. It is expected that states will continue to license/permit large vessel and thrill-craft operations which do not fall under the purview of a Federal agency and will issue regulations that will affect fishery activities. NMFS will continue to work with states to develop ESA Section 6 agreements and Section 10 permits to enhance programs to quantify and mitigate these takes. Increased recreational vessel activity in inshore waters of the Gulf of Mexico will likely increase the number of turtles taken by injury or mortality in vessel collisions. Recreational hook-and-line fisheries have been known to lethally take sea turtles, including Kemp's ridleys. In a study conducted by the NMFS Galveston Laboratory between 1993 through 1995, 170 ridleys were reported associated with recreational hook-and-line gear; including 18 dead stranded turtles, 51 rehabilitated turtles, 5 that died during rehabilitation, and 96 that were released by fishermen (Cannon and Flanagan, 1996). The Sea Turtle Stranding and Salvage Network (STSSN) also receives stranding reports that identify carcass anomalies that may be associated with the recreational fishery (entangled in line or net, fish line protruding, fish hook in mouth or digestive tract, fish line in digestive tract). The reports do not distinguish between commercial or recreational sources of gear, such as hook, net, and line, which may be used in both sectors. Cumulatively, fishery entanglement anomalies are noted in fewer than 4% of the stranded sea turtle carcasses reported

between 1990 and 1996, and some carcasses carry more than one anomaly (e.g., fishing line in digestive tract/fishing line protruding from mouth or cloaca), therefore summing these reports may result in some double counting.

VII. Conclusion

After reviewing the current status of the affected species of sea turtles, the environmental baseline for the action area, and the effects of the action, it is NMFS's biological opinion that the operation of the cooling water intake system of the Crystal River Energy Complex as outlined in the Nuclear Regulatory Commission's Biological Assessment, dated October 14, 1998, is not likely to jeopardize the continued existence of the loggerhead, leatherback, green, hawksbill, or Kemp's ridley sea turtles. No critical habitat has been designated for these species in the action area, therefore none will be affected. This conclusion is based on the action's effects on these species being limited to the direct take, through death or injury, of a small number of sub-adult and adult sea turtles per year.

VIII. Incidental Take Statement

Section 7 (b)(4) of the ESA requires that when a proposed agency action is found to be consistent with section 7(a)(2) of the ESA and the proposed action may incidentally take individuals of listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. It also states that reasonable and prudent measures, and terms and conditions to implement the measures, shall be provided that are necessary to monitor and minimize such impacts. Only incidental taking resulting from the agency action as described in the proposed action of the biological opinion, including incidental takings caused by activities approved by the agency, and that comply with the specified reasonable and prudent measures and terms and conditions, are exempt from the takings prohibition of section 9(a), pursuant to section 7(o) of the ESA.

Section 7(a)(2) of the ESA specifies that each federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such is not likely to jeopardize the continued existence of any endangered or threatened species.

NMFS has estimated the impact of CREC's operation of its cooling water intake system on listed species of sea turtles (see Assessment of Impacts above). Based on this analysis, NMFS anticipates 50 sea turtles (of the five species analyzed in this BO) with 5 being lethal (lethal take being turtles mortalities considered causally related to plant operations and verified by the FDEP) could be incidentally taken biannually (annual records are from January 1- December 31 each year), as a result of this action. This level of take will not jeopardize the continued existence of these species.

The following reasonable and prudent measures and terms and conditions are specified as required by 50 CFR 402.14 (i)(l)(ii) and (iv) to monitor and minimize the impact of incidental takings associated with the operation of the water intake system at CREC.

Reasonable and Prudent Measures

1. CREC will have a plan to monitor sea turtle activities around the bar racks and a plan to rescue sea turtles stranded on the bar racks.
2. CREC will keep records of sea turtle strandings at the plants.

Terms and Conditions

3. Continue implementation of the procedures outlined in the Sea Turtle Rescue and Handling Guidelines for CREC dated September 9, 1998. All updates of the rescue plan will be reviewed by the FDEP and NMFS.
4. If any listed species are apparently injured or killed in the intake canal or the bar racks, a report, summarizing the incident, must be provided to the NMFS Southeast Regional Office's Chief of Protected Resources, within 30 days of the incident.
5. All sea turtle takings will be recorded by species, size and time of year taken. These records will be made available to NMFS Southeast Regional Office's Chief of Protect Resources 30 days after the start of each year or upon written request during other parts of the year.

IX. Conservation Recommendations

Pursuant to section 7(a)(1) of the ESA, the following conservation recommendations are made to assist BSEP in reducing/eliminating impacts to listed and proposed species and promoting their conservation and recovery.

1. CREC should conduct tissue sampling for the genetic identity of turtles interacting with plant cooling water intake systems.
2. CREC should set up a tagging program for released sea turtles in conjunction with FDEP.
3. CREC should continue working on a design for diversion structures, which would be used to keep sea turtles away from the bar racks.

X. Reinitiation of Consultation

Reinitiation of formal consultation is required if (1) the amount or extent of taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat (when designated) in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, CREC must immediately request reinitiation of formal consultation.

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Florida Power
CORPORATION
Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72

October 12, 1999
3F1099-01

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

Subject: License Amendment Request #253, Revision 0
Revision of Appendix B Environmental Protection Plan (Non-Radiological) Technical Specifications to Incorporate National Marine Fisheries Service Biological Opinion (TAC No. MA1706)

Reference: NRC to FPC letter, 3N0799-05, dated July 15, 1999, "Crystal River Unit 3 - Section 7 Biological Consultation, Biological Opinion (TAC No. MA1706)"

Dear Sir:

Florida Power Corporation hereby submits a request for an amendment to its Facility Operating License No. DPR-72 for Crystal River Unit 3 (CR-3) in accordance with 10 CFR 50.90. License Amendment Request (LAR) #253, Attachment A, is being submitted as requested in the above reference, proposing changes to the Appendix B Environmental Protection Plan of the CR-3 Operating License. The changes incorporate requirements from the biological opinion (BO) issued by the National Marine Fisheries Service. The BO reviews the effects of the cooling water intake system. Additionally, other administrative changes are proposed to Appendix B. An approval date of November 1, 2000, is requested for the LAR with an implementation period of thirty days.

The revised pages are provided in Attachments B (redline/strikeout format) and C (revision bar format). This letter establishes no new regulatory commitments.

If you have any questions regarding this submittal, please contact Mr. Sid Powell, Manager, Nuclear Licensing at (352) 563-4883.

Sincerely,

John J. Holden
Vice President and Site Director

JJH/dah

xc: Regional Administrator, Region II
NRR Project Manager
Senior Resident Inspector

Attachments:

A. License Amendment Request #253, Revision 0; Revision of Appendix B Environmental Protection Plan (Non-Radiological) Technical Specifications to Incorporate National Marine Fisheries Service Biological Opinion
B. Environmental Protection Plan (Non-Radiological) Technical Specification Pages in Redline/Strikeout Format
C. Environmental Protection Plan (Non-Radiological) Technical Specification Pages in Revision Bar Format

STATE OF FLORIDA

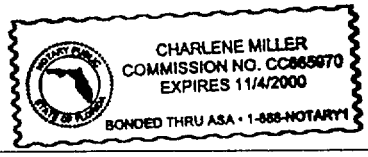
COUNTY OF CITRUS

John J. Holden states that he is the Vice President and Site Director for Florida Power Corporation; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the information attached hereto; and that all such statements made and matters set forth therein are true and correct to the best of his knowledge, information, and belief.

John J. Holden
Vice President and Site Director

Sworn to and subscribed before me this 12th day of October, 1999, by John J. Holden.

Signature of Notary Public
State of Florida



(Print, type, or stamp Commissioned
Name of Notary Public)

Personally Known ✓ -OR- Produced Identification _____

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72

ATTACHMENT A

LICENSE AMENDMENT REQUEST #253, REVISION 0

REVISION OF APPENDIX B ENVIRONMENTAL PROTECTION PLAN (NON-RADIOLOGICAL) TECHNICAL SPECIFICATIONS TO INCORPORATE NATIONAL MARINE FISHERIES SERVICE BIOLOGICAL OPINION

DESCRIPTION OF CHANGE
REASON FOR REQUEST
EVALUATION OF REQUEST
NO SIGNIFICANT HAZARDS CONSIDERATION
ENVIRONMENTAL IMPACT EVALUATION

LICENSE AMENDMENT REQUEST #253, REVISION 0

LICENSE DOCUMENT INVOLVED:

Appendix B - Part II - Environmental Protection Plan (Non-Radiological) Technical Specifications to the Facility Operating License No. DPR-72

PORTIONS:

1.0 - "Objectives of the Environmental Protection Plan"
2.0 - "Environmental Protection Issues"
3.0 - "Consistency Requirements"
4.0 - "Environmental Conditions"

DESCRIPTION OF CHANGE:

Changes are being proposed to the Crystal River Unit 3 (CR-3) Environmental Protection Plan (EPP), Appendix B - Part II of the operating license, to reflect the Biological Opinion (BO) issued by the National Marine Fisheries Service (NMFS). The NMFS BO reviews the effect of the Crystal River Energy Complex (CREC) on species of sea turtles protected by the Endangered Species Act (ESA). The changes to the CR-3 EPP are being proposed as requested by the NRC in Reference 4. The proposed changes will ensure that the required information from the NMFS BO is included in the CR-3 EPP.

Other administrative changes are also being proposed to the CR-3 EPP as shown in the attached mark ups. Included in these changes is the clarification that the National Pollutant Discharge Elimination (NPDES) Permit for CR-3 is implemented by the State of Florida, Department of Environmental Protection (FDEP) through the Industrial Wastewater Facility Permit instead of through the Environment Protection Agency (EPA). Additionally, the reference to the State 401 Certification is being deleted. This was previously supplied by the state to the EPA to certify that the EPA NPDES Permit also met all state limitations on effluent discharges. This certification is no longer applicable since the state now issues the Industrial Wastewater Facility Permit. Also included is a change in Section 3.1 to replace an out-of-date reference to 10 CFR 51.5(b)(2) with 10 CFR 51.22, which currently defines the criteria for categorical exclusion from environmental review. Editorial changes have also been included to correct typographical errors and to provide formatted headers and footers.

REASON FOR REQUEST:

On July 17, 1998 (Reference 1), based on a May 13, 1998 meeting regarding the recent influx of endangered sea turtles into the CREC intake canal system, the NRC requested Florida Power Corporation (FPC) to prepare a biological assessment (BA) in accordance with the Endangered Species Act and 50 CFR Part 402, Interagency Cooperation - Endangered Species Act of 1973, as amended. FPC completed this BA and forwarded the report to the NRC on October 1, 1998 (Reference 2). The NRC subsequently requested initiation of formal

consultation regarding the taking of endangered and threatened species of sea turtles from NMFS on October 14, 1998 (Reference 3) based on the completion of the BA.

On July 15, 1999 (Reference 4), the NRC transmitted the BO prepared by NMFS to FPC. The NMFS BO was the result of the ESA consultation regarding the continued operation of the circulating water systems of the CREC. The NMFS concluded that the operation of the cooling water intake systems of the CREC is not likely to jeopardize the continued existence of the loggerhead, leatherback, green, hawksbill, or Kemp's ridley sea turtles. The NMFS developed an Incidental Take Statement, which includes terms and conditions necessary to monitor and minimize the lethal take of sea turtles in the cooling water intake canal.

In Reference 4, the NRC requested FPC to submit proposed changes to the CR-3 EPP to reference the Incidental Take Statement included in the NMFS BO and provide that the reasonable and prudent measures, and the terms and conditions, as detailed in the Incidental Take Statement, will be implemented.

EVALUATION OF REQUEST:

The NMFS BO has concluded that the operation of the cooling water intake system of the CREC is not likely to jeopardize the continued existence of the loggerhead, leatherback, green, hawksbill, or Kemp's ridley sea turtles. Accordingly, the NMFS has issued an Incidental Take Statement in the BO which establishes terms and conditions necessary to monitor and minimize the incidental take of these species. As requested by the NRC, this information is proposed to be added to the CR-3 EPP in order for the NRC to fulfill its responsibility under Section 7 of the ESA.

Reasonable and Prudent Measures

NMFS has stipulated that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the Kemp's ridley, green, loggerhead, leatherback, and hawksbill sea turtles:

1. CREC will monitor sea turtle activities around the bar racks and rescue sea turtles stranded on the bar racks.

2. CREC will keep records of sea turtle strandings at the plants.

These measures are required to decrease the number of lethal takes caused by plant operations. The implementation of a plan to monitor the cooling water intake structures and to rescue sea turtles stranded on them before they are killed will reduce the number of lethal takes.

Terms and Conditions

NMFS has provided the following terms and conditions in the Incidental Take Statement:

1. Continue implementation of the procedures outlined in the Sea Turtle Rescue and Handling Guidelines for the CREC dated September 9, 1998. All updates of the rescue plan will be reviewed by the FDEP and NMFS.

(Note: On July 1, 1999, the Florida Marine Research Institute and the Bureau of Protected Species were moved from the FDEP to the Fish and Wildlife Conservation Commission (FWCC). Accordingly, 'FWCC' is substituted for 'FDEP' in the proposed changes to the CR-3 EPP.)

2. If any listed species are apparently injured or killed in the intake canal or on the bar racks, a report, summarizing the incident, must be provided to the NMFS Southeast Regional Office's (SERO) Assistant Regional Administrator, Protected Resources Division, within 30 days of the incident.

3. All sea turtle takes at the plant will be recorded by species, size and time of year taken. These records will be made available to the SERO Assistant Regional Administrator, Protected Resources Division, 30 days after the start of each year or upon written request during other parts of the year. If within a two year period, non-lethal takes reach 40 individuals, causally related lethal takes reach 3 individuals, or if takes of non-causally related dead turtles reach 6 individuals, CREC will notify the SERO Assistant Regional Administrator, Protected Resources Division within 5 days. After these levels of take are reached, any subsequent take must be reported to the SERO Assistant Regional Administrator, Protected Resources Division within 24 hours of the take. Final disposition of all sea turtles taken at the plant (live, lethal, or non-causally related lethal) shall be in accordance with the Sea Turtle Rescue and Handling Guidelines for the CREC dated September 9, 1998.

NMFS believes that no more than 63 sea turtles will be incidentally taken every two years as a result of the proposed action. Thirteen of these takes will be lethal including eight that are non-causally related to plant operations. The reasonable and prudent measures and their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If during the course of this action, this level of incidental take is exceeded, such incidental take represents new information requiring re-initiation of consultation and review of the reasonable and prudent measures provided.

NO SIGNIFICANT HAZARDS CONSIDERATION:

FPC has reviewed the requirements of 10 CFR 50.92 as they apply to the proposed LAR. FPC considers that the changes do not involve a significant hazards consideration. In support of this conclusion, the following analysis is provided:

1. *Involve a significant increase in the probability or consequences of an accident previously evaluated?*

   The proposed changes to the CR-3 EPP are administrative in nature and reflect the information provided in the NMFS BO. These changes do not affect the initial conditions, assumptions, or conclusions of the CR-3 accident analyses. In addition, the proposed changes do not affect the operation or performance of any equipment assumed in the accident analyses. Therefore, the proposed

changes would not significantly increase the probability or consequences of an accident previously evaluated.

2. *Create the possibility of a new or different kind of accident from previously evaluated accidents?*

   The proposed changes are administrative in nature and reflect information provided by the NMFS BO regarding the incidental taking of species of sea turtles protected by the ESA. These changes do not impact or alter the configuration or operation of the facilities and do not create any new modes of operation. Therefore, the proposed changes would not create the possibility of a new or different kind of accident.

3. *Involve a significant reduction in a margin of safety?*

   As indicated above, the proposed changes do not change the configuration or operation of the plant and do not affect the CR-3 accident analyses. The proposed changes are administrative in nature and do not affect any margin of safety for CR-3. Therefore, the proposed changes would not result in a significant reduction in a margin of safety.

ENVIRONMENTAL IMPACT EVALUATION:

While 10 CFR 51 requires an environmental assessment (EA) or environmental impact statement (EIS) for any "major Federal action significantly affecting the quality of the human environment," it does allow the NRC discretion in evaluating the extent to which EAs or EISs are necessary. EAs or EISs are not required for any action included in the list of "categorical exclusions" set forth in 10 CFR 51.22(c). Specifically, 10 CFR 51.22(c)(9), provides that an EA is not required for the issuance of an amendment provided that:

(i) the amendment involves no significant hazards consideration,
(ii) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, and
(iii) there is no significant increase in individual or cumulative occupational radiation exposure.

FPC considers that the provisions of 10 CFR 51.22(c)(9) are applicable to this request for changes to the CR-3 EPP. For the reasons described below and elsewhere in this submittal, FPC believes that the three criteria of 10 CFR 51.22(c)(9) are satisfied. Therefore, this LAR should be considered under the "categorical exclusions" provisions of 10 CFR 51.22(c)(9).

The basis for this determination includes the following:

1. The proposed changes to the CR-3 EPP do not involve significant hazards consideration as discussed above in the No Significant Hazards Consideration.

2. The proposed changes to the CR-3 EPP do not result in a significant change in the types or significant increase in the amounts of any effluents that may be

released offsite. The change does not result in an increase in the consequences of previously evaluated accidents. Therefore, there will be no environmental impact from the proposed CR-3 EPP changes.

3. The proposed changes to the CR-3 EPP do not result in a significant increase in individual or cumulative occupational exposure. This conclusion is based on the facts that changes to the CR-3 EPP are administrative in nature, non-radiological, do not result in any increased consequences of accidents previously evaluated, and are not initiators of a design basis accident or event.

Additionally, the effect of the continued use of the cooling water intake systems at the CREC on species of sea turtles protected by the ESA have been reviewed by the NMFS. The NMFS BO concludes that the continued operation of the circulating water systems at CREC is not likely to jeopardize the continued existence of the loggerhead, leatherback, green, hawksbill, or Kemp's ridley sea turtles. No critical habitat has been designated for these species in the action area; therefore, none will be affected. The Incidental Take Statement identifies actions that have been or will be taken by CREC to ensure the takes of endangered sea turtles are limited.

Therefore, for the reasons given in this submittal, there will be no change in offsite consequences due to this action and its impact is bounded by the impacts assumed in the existing Final Environmental Statement (FES) for CR-3 and the NMFS BO. Should the NRC choose to perform an EA, information provided in the FES, together with this submittal, would assist the NRC in making a "finding of no significant impact" in accordance with 10 CFR 51.32.

REFERENCES:

1. NRC to FPC letter, 3N0798-12, dated July 17, 1998, "Request for Preparation of Biological Assessment for Crystal River Unit 3 (TAC No. MA1706)"

2. FPC to NRC letter, 3F1098-10, dated October 1, 1998, "Biological Assessment for Crystal River Unit 3 (TAC No. MA1706)"

3. NRC to NMFS letter, 3N1098-10, dated October 14, 1998, "Biological Assessment of Impacts to Sea Turtles at Crystal River Energy Complex (TAC No. MA1706)"

4. NRC to FPC letter, 3N0799-05, dated July 15, 1999, "Crystal River Unit 3 - Section 7 Biological Consultation, Biological Opinion (TAC No. MA1706)"

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72

ATTACHMENT B

ENVIRONMENTAL PROTECTION PLAN (NON-RADIOLOGICAL) TECHNICAL SPECIFICATION PAGES IN

REDLINE/STRIKEOUT FORMAT

Added text is shown as **shaded**.

Deleted text is shown as ~~strikeout~~.

APPENDIX B - PART II

TO FACILITY OPERATING LICENSE NO. DPR-72

CRYSTAL RIVER UNIT 3

FLORIDA POWER CORPORATION

DOCKET NO. 50-302

ENVIRONMENTAL PROTECTION PLAN

(NON-RADIOLOGICAL)

TECHNICAL SPECIFICATIONS

1.0 Objectives of the Environmental Protection Plan

The Environmental Protection Plan (EPP) is to provide for protection of environmental values during operation and additional construction of the Crystal River Unit 3. The principal objectives of the EPP are as follows:

1. Verify that Crystal River Unit 3 is operated in an environmentally acceptable manner, as established by the Final Environmental Statement (FES) and other NRC environmental impact assessments.

2. Coordinate NRC requirements and maintain consistency with other Federal, State and local requirements for environmental protection.

3. Keep NRC informed of the environmental effects of Crystal River Unit 3 operation and additional construction, and of actions taken to control those effects.

Environmental concerns identified in the FES which relate to water quality matters are regulated by way of licensee's National Pollutant Discharge Elimination System (NPDES) Ppermit implemented by the State of Florida, Department of Environmental Protection (FDEP) through the Industrial Wastewater Facility Permit (hereafter referred to as the NPDES Permit).

2.0 Environmental Protection Issues

In the FES-Operating License, dated May 1973, NRC staff considered the environmental impacts associated with the operation of Crystal River Unit 3. Certain environmental issues were identified which required study or license conditions to resolve environmental concerns and to assure adequate protection of the environment. The Appendix B Environmental Technical Specifications (ETS) issued with the license included discharge restrictions and monitoring programs to resolve the issues. Prior to issuance of this EPP, the requirements remaining in the ETS were:

1. The need to control the release of heat (temperature) and chlorine within those discharge concentrations evaluated.

2. The need for aquatic monitoring programs to confirm that thermal mixing occurs as predicted, and that effects on aquatic biota and water quality due to plant operation are no~~,~~ greater than predicted.

3. The need for special studies to document levels of intake entrainment and impingement.

Aquatic issues ~~are~~ were addressed by the effluent limitations, monitoring requirements and the Section 316(b) demonstration requirement contained in the effective NPDES Ppermit formerly issued by the Environmental Protection Agency~~EPA~~ Region IV. Note: The FDEP now issues the Industrial Wastewater Facility Permit under the NPDES.

3.0 Consistency Requirements

3.1 Crystal River Unit 3 Design and Operation

The licensee may make changes in station design or operation or perform tests or experiments affecting the environment provided such changes, tests or experiments do not involve an unreviewed environmental question. Changes in plant design or operation or performance of tests or experiments which do not affect the environment are not subject to this requirement.

Before engaging in unauthorized construction or operational activities which may affect the environment, the licensee shall perform an environmental evaluation of such activity.* When the evaluation indicates that such activity involves an unreviewed environmental question, the licensee shall provide a written evaluation of such activities and obtain prior approval from the NRC.

A proposed change, test or experiment shall be deemed to involve an unreviewed environmental question if it concerns (1) a matter which may result in a significant increase in any adverse environmental impact previously evaluated in the FES, supplements to the FES, environmental impact appraisals, or in any decisions of the Atomic Safety and Licensing Board; or (2) a significant change in effluents

* Activities are excluded from this requirement if all measurable nonradiological effects are confined to the on-site areas previously disturbed during site preparation and construction.

(in accordance with 10 CFR 51.22) or power level ~~(in accordance with 10 CFR Part 51.5(b)(2))~~; or (3) a matter not previously reviewed and evaluated in the documents specified in (1) of this Subsection, which may have a significant adverse environmental impact.

The licensee shall maintain records of changes in facility design or operation and of tests and experiments carried out pursuant to this Subsection. These records shall include a written evaluation which provides bases for the determination that the change, test, or experiment does not involve an unreviewed environmental question.

Records of modifications to plant structures, systems and components determined to potentially affect the continued protection of the environment shall be retained for the life of the plant. All other records, data and logs relating to this EPP shall be retained for five years or, where applicable, in accordance with the requirements of other agencies.

Activities governed by Section 3.3 of this EPP are not subject to the requirements of this section.

3.2 Reporting Related to the NPDES Permit ~~and State Certification~~

1. Violations of the NPDES Permit ~~or the State 401 Certification Conditions~~ shall be reported to the NRC by submittal of copies of the reports required by the NPDES Permit ~~or State 401 Certification~~.

2. The licensee shall provide the NRC with a copy of any 316(a) or (b) studies and/or related documentation at the same time it is submitted to the permitting agency.

3. Changes and additions to the NPDES Permit ~~or the State 401 Certification~~ shall be reported to the NRC within 30 days following the date the change is approved. If a permit ~~or certification~~, in part or in its entirety, is appealed and stayed, the NRC shall be notified within 30 days following the date the stay is granted.

4. The NRC shall be notified of changes to the effective NPDES Permit proposed by the licensee by providing NRC with a copy of the proposed change at the same time it is submitted to the permitting agency. The licensee shall provide the NRC a copy of the application for renewal of the NPDES Permit at the same time the application is submitted to the permitting agency.

3.3 Changes Required for Compliance with Other Environmental Regulations

Changes in Crystal River Unit 3 design or operation and performance of tests or experiments which are required to achieve compliance with other Federal, State, or local environmental regulations are not subject to the requirements of Section 3.1.

4.0 Environmental Conditions

4.1 Significant Environmental Events

Any occurrence of a significant event that indicates or could result in significant environmental impact causally related to station operation shall be recorded ~~,~~and promptly reported to the NRC within 24 hours* followed by a written report within 30 days. No routine monitoring programs are required to implement this condition.

The written report shall (a) describe, analyze, and evaluate the event, including extent and magnitude of the impact and plant operating characteristics, (b) describe the probable cause of the event, (c) indicate the action taken to correct the reported event, (d) indicate the corrective action taken to preclude repetition of the event and to prevent similar occurrences involving similar components or systems, and (~~a~~e) indicate the agencies notified and their preliminary responses.

Events reportable under this subsection which also require reports to other Federal, State or local agencies shall be reported in accordance with those reporting requirements in lieu of the requirements of this subsection. The NRC shall be provided a copy of such report at the same time it is submitted to the other agency.

The following are examples of significant environmental events: excessive bird impaction events; onsite plant or animal disease outbreaks; mortality or unusual occurrence of any species protected by the Endangered Species Act of 1973; unusual fish kills; and increase in nuisance organisms or conditions.

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* If a significant environmental event occurs over weekends or holidays the report shall be supplied within 24 hours of the first working day following the weekend or holiday.

4.2 Endangered or Threatened Sea Turtles

Endangered or threatened sea turtles shall be protected in accordance with the Incidental Take Statement issued by the National Marine Fisheries Service (NMFS).

4.2.1 Incidental Take Statement

The NMFS has reviewed the impact of the Crystal River Energy Complex (CREC) operation on listed species of sea turtles and determined that CREC operations are not likely to result in jeopardy to the Kemp's ridley, green, loggerhead, leatherback, and hawksbill sea turtles. Numerical limits are established by NMFS on live takes, lethal takes causally related to plant operation, and lethal takes not related to plant operations.

4.2.2 NMFS Reasonable and Prudent Measures

In order to provide protection of sea turtles, the following reasonable and prudent measures are appropriate to minimize impacts to sea turtles:

a. Monitor sea turtle activities around the CREC bar racks and rescue sea turtles stranded on the bar racks, and

b. Keep records of sea turtle strandings.

4.2.3 NMFS Non-discretionary Terms and Conditions

The following non-discretionary terms and conditions implement the above reasonable and prudent measures:

a. Continue implementation of the approved Sea Turtle Rescue and Handling Guidelines. Subsequent revisions shall be submitted for review to NMFS and the Florida Fish and Wildlife Conservation Commission.

b. Report to the NMFS any injured or killed sea turtle in the intake canal or bar racks within 30 days of the incident.

c. Record all sea turtle takes by species, size and date. Verbal notifications and written reports must be provided to the NMFS as required by the Biological Opinion.

FLORIDA POWER CORPORATION

CRYSTAL RIVER UNIT 3

DOCKET NUMBER 50-302/LICENSE NUMBER DPR-72

ATTACHMENT C

ENVIRONMENTAL PROTECTION PLAN (NON-RADIOLOGICAL) TECHNICAL SPECIFICATION PAGES IN

REVISION BAR FORMAT

ATTACHMENT TO LICENSE AMENDMENT NO.

FACILITY OPERATING LICENSE NO. DPR-72

DOCKET NO. 50-302

Replace the following pages of the Appendix B - Part II Environmental Protection Plan (Non-Radiological) Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE	INSERT
Cover	Cover
1-1	1-1
2-1	2-1
3-1	3-1
3-2	3-2
3-3	---
4-1	4-1
4-2	4-2

APPENDIX B - PART II

TO FACILITY OPERATING LICENSE NO. DPR-72

CRYSTAL RIVER UNIT 3

FLORIDA POWER CORPORATION

DOCKET NO. 50-302

ENVIRONMENTAL PROTECTION PLAN

(NON-RADIOLOGICAL)

TECHNICAL SPECIFICATIONS

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2. Coordinate NRC requirements and maintain consistency with other Federal, State and local requirements for environmental protection.

3. Keep NRC informed of the environmental effects of Crystal River Unit 3 operation and additional construction, and of actions taken to control those effects.

Environmental concerns identified in the FES which relate to water quality matters are regulated by way of licensee's National Pollutant Discharge Elimination System (NPDES) Permit implemented by the State of Florida, Department of Environmental Protection (FDEP) through the Industrial Wastewater Facility Permit (hereafter referred to as the NPDES Permit).

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3. The need for special studies to document levels of intake entrainment and impingement.

Aquatic issues were addressed by the effluent limitations, monitoring requirements and the Section 316(b) demonstration requirement contained in the effective NPDES Permit formerly issued by the Environmental Protection Agency-Region IV. Note: The FDEP now issues the Industrial Wastewater Facility Permit under the NPDES.

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The licensee shall maintain records of changes in facility design or operation and of tests and experiments carried out pursuant to this Subsection. These records shall include a written evaluation which provides bases for the determination that the change, test, or experiment does not involve an unreviewed environmental question.

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(continued)

3.0 Consistency Requirements

3.1 Crystal River Unit 3 Design and Operation (continued)

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(continued)

4.0 Environmental Conditions

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a. Continue implementation of the approved Sea Turtle Rescue and Handling Guidelines. Subsequent revisions shall be submitted for review to NMFS and the Florida Fish and Wildlife Conservation Commission.

b. Report to the NMFS any injured or killed sea turtle in the intake canal or bar racks within 30 days of the incident.

c. Record all sea turtle takes by species, size and date. Verbal notifications and written reports must be provided to the NMFS as required by the Biological Opinion.