



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

July 25, 2012

Dr. Roy Crabtree  
Southeast Regional Administrator  
National Marine Fisheries Service  
263 13<sup>th</sup> Avenue South  
St. Petersburg, FL 33701

SUBJECT: INCIDENTAL TAKE LIMIT MET FOR GREEN TURTLES AT BRUNSWICK  
STEAM ELECTRIC PLANT, UNITS 1 AND 2

Dear Dr. Crabtree:

The U.S. Nuclear Regulatory Commission (NRC, the staff) is writing to notify you that Carolina Power & Light Co. (CP&L; the licensee) has met, but not exceeded the incidental take limit specified in the National Marine Fisheries Service's (NMFS) January 20, 2000, biological opinion for Brunswick Steam Electric Plant, Units 1 and 2 (Brunswick). Brunswick is located 15 miles south of Wilmington, North Carolina, in Southport, North Carolina, along the mouth of the Cape Fear River.

NMFS and the NRC have consulted under section 7 of the Endangered Species Act of 1973, as amended (ESA), regarding Brunswick since the late 1990s. In 1998, the NRC submitted a biological assessment to and requested formal consultation with NMFS as a result of incidental takes of sea turtles in the Brunswick cooling water intake system. The NMFS issued a biological opinion on April 30, 1999. Following the issuance of this biological opinion, Brunswick incidentally took two Kemp's ridley sea turtles (*Lepidochelys kempii*) in 1999, which triggered NRC to request reinitiation of formal consultation in October 1999. The NMFS issued its most recent biological opinion regarding Brunswick on January 20, 2000. This biological opinion includes an incidental take statement for five species of sea turtles; Table 1 (Enclosure 1) identifies the incidental take limits established for each species.

Between January 1, 2012, and July 10, 2012, Brunswick has incidentally taken 15 sea turtles. Brunswick has met, but not exceeded, the 2000 biological opinion incidental take limit for injured or dead green turtles (*Chelonia mydas*) causally related to plant operations. Brunswick has also taken an additional three dead turtles—two loggerheads (*Caretta caretta*) and one Kemp's ridley (*Lepidochelys kempii*)—whose deaths were attributable to plant operations. Table 2 (Enclosure 1) summarizes the date, species, and condition of each of the 15 incidental takes.

By comparison, between 2000 and 2011, Brunswick incidentally took an average of 1.75 sea turtles per year whose deaths were attributable to plant operations. Table 3 (Enclosure 2) summarizes the incidental takes since NMFS's issuance of the 2000 biological opinion. Tables 4, 5, and 6 (Enclosures 3, 4, and 5, respectively) provide incidental take information by species. Only one of the incidental takes during this time period was a dead green turtle. Thus, the three dead green turtle incidental takes that Brunswick has experienced to date in 2012 are an anomaly. Brunswick has also incidentally taken a higher number of sea turtles (all species, both dead and alive) than is usual for this early in the sea turtle season, which runs from April 1 through August 31 of each year.

From May 6 through May 8, 2012, Brunswick experienced unusually high tides due to a “super moon” full moon. High tides were 4 to 5 feet above mean seal level during this time, whereas typical high tides are about 2.5 to 3 feet above mean sea level. Following the high tides, the licensee inspected the turtle fencing in the intake canal on May 9, 2012, and found that the fencing was damaged in several places. The licensee attributed the damage to debris that was carried from the marsh bordering the intake canal into the intake canal during the high tide surge. While the fence was damaged, sea turtles had open access to the two-mile-long intake canal from the adjacent marsh area.

All of the 2012 incidental takes to date have been juvenile turtles. Juvenile green, Kemp's ridley, and loggerhead turtles move from open ocean habitat as hatchlings to nearshore foraging habitat once they reach a certain size. Thus, juvenile sea turtles are likely to occur in the Cape Fear estuary as well as the marsh area bordering the Brunswick intake canal because it provides prime foraging habitat. The small size of juveniles would make them more susceptible to being carried by currents from the marsh area into the intake canal during the high tide event, which likely explains the three green turtle takes during the high tide event. Following the high tide event, an unknown number of sea turtles may have remained in the canal despite the licensee's increased inspections of the canal (described below) because the intake canal is approximately two miles long and the water in the canal is murky. Thus, the majority of the incidental takes following the high tide were likely turtles that had entered the canal during the high tide surge.

On May 10, 2012, CP&L personnel spoke with Dr. Matthew Godfrey, North Carolina Sea Turtle Coordinator, North Carolina Wildlife Resources Commission (NCWRC). Dr. Godfrey confirmed that the higher proportion of green turtles from the 2012 incidental takes was likely correlated with the higher population of green turtles in the vicinity of Brunswick compared with the population level when the 2000 biological opinion was issued. Dr. Godfrey noted that the warmer 2011-2012 winter has led to warmer waters, and thus, more sea turtles have migrated into the region earlier in the 2012 season. Large gill net fishing has been temporarily suspended for several periods this season due to the large numbers of sea turtles that have been caught as bycatch. This fact provides evidence of a larger regional sea turtle population. Dr. Godfrey also noted that the proportion of green turtles to Kemp's ridley turtles has been shifting in the past year, and the NCWRC is now observing more green turtles than Kemp's ridley turtles.

On May 16, 2012, the licensee performed quarterly maintenance inspections of the intake canal, turtle fencing, and diversion structures for breaches in integrity that could allow sea turtles to enter the canal. The licensee completed interim repairs of the turtle fencing on May 23, 2012; however, the licensee is considering replacing the fencing entirely following the end of the turtle season. CP&L dive personnel completed a thorough inspection of the intake structures on May 29, 2012.

Following the high tide event, the licensee has also increased its inspections beyond the requirements contained in the 2000 biological opinion. CP&L environmental personnel and dive personnel have increased the frequency of turtle sighting patrols and inspections along the intake canal. The licensee has also increased the frequency of its intake canal physical barrier inspections from quarterly to bi-weekly through the end of the sea turtle season. Security personnel have begun using binoculars to aid intake canal monitoring when conducting tours near the service water and circulating water pump intake structures.

In conclusion, the NRC believes that the high tide event accounts for the majority of the incidental takes that Brunswick has experienced to date. The licensee has responded proactively to repair damage and increase inspections of the intake canal and associated structures. Brunswick has met, but not exceeded, the 2000 biological opinion incidental take limit for injured or dead green turtles causally related to plant operations. Thus, the NRC concludes that reinitiation of section 7 consultation is not warranted at this time. However, if Brunswick exceeds its incidental take limits prior to the end of 2012, the NRC will reinitiate section 7 consultation in accordance with 50 CFR 402.16(a).

Please contact Ms. Briana Balsam, Biologist, of my staff with any questions you might have about the information in this letter. You can reach her at 301-415-1042 or by e-mail at [Briana.Balsam@nrc.gov](mailto:Briana.Balsam@nrc.gov). I have also forwarded a copy of this letter to Ms. Nicole Bailey of your office. Ms. Bailey has been NRC's point of contact for the informal section 7 consultation regarding Atlantic sturgeon (*Acipenser oxyrinchus*) at Brunswick.

Sincerely,

A handwritten signature in black ink that reads "Michelle Moser for". The signature is written in a cursive, flowing style.

Amy Hull, Acting Chief  
Environmental Review and  
Guidance Update Branch  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-324 and 50-325

Enclosure:  
As stated

cc w/encl: Listserv

**Table 1. 2000 Biological Opinion Incidental Take Limits**

<b>Species</b>	<b>Allowable Take (Annual Basis)</b>
<b>Injured or dead causally related to plant operations</b>	
loggerhead turtle ( <i>Caretta caretta</i> )	6
Kemp's ridley turtle ( <i>Lepidochelys kempii</i> )	2
green turtle ( <i>Chelonia mydas</i> )	3
leatherback turtle ( <i>Dermochelys coriacea</i> ) or hawksbill turtle ( <i>Eretmochelys imbricata</i> )	1
<b>Alive without injury</b>	
Any of the five sea turtle species	50
<b>Previously dead (not killed as a result of plant operations)</b>	
Any of the five sea turtle species	unquantified

**Table 2. 2012 Year-to-Date Incidental Takes**

<b>No.</b>	<b>Date</b>	<b>Species</b>	<b>Condition</b>
1	May 7, 2012	green	dead (casual)
2	May 8, 2012	green	dead (casual)
3	May 8, 2012	green	dead (casual)
4	May 10, 2012	Kemp's ridley	dead (non-causal)
5	May 14, 2012	loggerhead	alive without injury
6	May 18, 2012	Kemp's ridley	alive without injury
7	May 29, 2012	loggerhead	dead (causal)
8	June 2, 2012	Kemp's ridley	dead (causal)
9	June 4, 2012	Kemp's ridley	alive without injury
10	June 7, 2012	loggerhead	dead (causal)
11	June 7, 2012	Kemp's ridley	alive without injury
12	June 15, 2012	green	alive without injury
13	June 24, 2012	loggerhead	dead (causal)
14	July 4, 2012	loggerhead	alive without injury
15	July 9, 2012	loggerhead	alive without injury

**Table 3. Summary of Incidental Takes, 2000-Present**

<b>Species</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012 (YTD)</b>	<b>TOTAL</b>
<b>injured or dead causally related to plant operations</b>														
green	0	0	0	0	1	0	0	0	0	0	0	0	3	4
loggerhead	1	1	2	1	3	1	0	0	1	1	0	0	3	14
Kemp's ridley	1	1	0	0	0	2	0	1	1	1	1	1	1	10
hawksbill or leatherback	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>alive without injury</b>														
any species	29	9	9	7	12	7	10	3	10	5	3	7	7	118
<b>previously dead (not killed as a result of plant operations)</b>														
any species	2	0	0	0	0	0	1	0	0	0	0	0	1	4
<b>TOTAL</b>	<b>33</b>	<b>11</b>	<b>11</b>	<b>8</b>	<b>16</b>	<b>10</b>	<b>11</b>	<b>4</b>	<b>12</b>	<b>7</b>	<b>4</b>	<b>8</b>	<b>15</b>	<b>150</b>

**Table 4. Green Turtle Incidental Takes, 2000-Present**

Year	Condition of Turtle			Total Take
	Alive without injury	Injured or dead causally related to plant operations	Previously dead (not killed as a result of plant operations)	
2000	2	0	0	2
2001	2	0	0	2
2002	1	0	0	1
2003	2	0	0	2
2004	1	1	0	2
2005	0	0	0	0
2006	0	0	0	0
2007	0	0	0	0
2008	4	0	0	4
2009	0	0	0	0
2010	0	0	0	0
2011	1	0	0	1
Annual Take Average, 2000-2011	1.08	0.08	0	1.17
2012 (YTD)	1	3	0	4

**Table 5. Loggerhead Turtle Incidental Takes, 2000-Present**

Year	Condition of Turtle			Total Take
	Alive without injury	Injured or dead causally related to plant operations	Previously dead (not killed as a result of plant operations)	
2000	24	1	2	27
2001	3	1	0	4
2002	6	2	0	8
2003	3	1	0	4
2004	8	3	0	11
2005	6	1	0	7
2006	9	0	1	10
2007	2	0	0	2
2008	3	1	0	4
2009	3	1	0	4
2010	0	0	0	0
2011	2	0	0	2
Annual Take Average, 2000-2011	5.75	0.92	0.25	6.92
2012 (YTD)	3	2	0	5

**Table 6. Kemp's Ridley Turtle Incidental Takes, 2000-Present**

Year	Condition of Turtle			Total Take
	Alive without injury	Injured or dead causally related to plant operations	Previously dead (not killed as a result of plant operations)	
2000	3	1	0	4
2001	4	1	0	5
2002	2	0	0	2
2003	2	0	0	2
2004	3	0	0	3
2005	1	2	0	3
2006	1	0	0	1
2007	1	1	0	2
2008	3	1	0	4
2009	2	1	0	3
2010	3	1	0	4
2011	4	1	0	5
Annual Take Average, 2000-2011	2.42	0.75	0	3.17
2012 (YTD)	3	1	1	4



In conclusion, the NRC believes that the high tide event accounts for the majority of the incidental takes that Brunswick has experienced to date. The licensee has responded proactively to repair damage and increase inspections of the intake canal and associated structures. Brunswick has met, but not exceeded, the 2000 biological opinion incidental take limit for injured or dead green turtles causally related to plant operations. Thus, the NRC concludes that reinitiation of section 7 consultation is not warranted at this time. However, if Brunswick exceeds its incidental take limits prior to the end of 2012, the NRC will reinitiate section 7 consultation in accordance with 50 CFR 402.16(a).

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Sincerely,

**/RA M. Moser for/**

Amy Hull, Acting Chief  
Environmental Review and  
Guidance Update Branch  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-324 and 50-325

Enclosure:  
As stated

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ADAMS Accession No.: **ML12185a024**

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Letter to R. Crabtree from A. Hull dated July 25, 2012

SUBJECT: INCIDENTAL TAKE LIMIT MET FOR GREEN TURTLES AT BRUNSWICK  
STEAM ELECTRIC PLANT, UNITS 1 AND 2

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