

IMPINGEMENT MONITORING PROGRAM

REPORT NO. 1 - APRIL 1977

SALEM NUCLEAR GENERATING STATION
UNIT NO. 1

DOCKET NO. 50-272
OPERATING LICENSE NO. DPR-70

Docket # 50-272
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Date 5-19-77 of Document:
REGULATORY DOCKET FILE

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
NEWARK, NEW JERSEY
MAY 20, 1977

SUMMARY

This is the first monthly impingement monitoring program report required by the proposed changes to Section 3.1.2.2 of the Environmental Technical Specifications (ETS). The ETS are Appendix B of the Salem Nuclear Generating Station (SNGS) Operating License No. DPR-70. The tabular of summaries attached include daily estimates of the number and weight of fish impinged on the Circulating Water System (CWS) traveling screens (Tables 1 and 2) and the Service Water System (SWS) traveling screens (Table 3).

The monitoring program at both locations was initiated on April 18, 1977 and consisted of three 24-hour sampling periods per week at the CWS. A comparable set of samples was collected at the SWS. The CWS screens were sampled four times per 24-hour period at approximately six-hour intervals. The samples were collected by diverting approximately three minutes of screen wash water to either the counting pool or inclined trash screen located on the north end of the CWS intake structure. Survival rates were calculated for pool samples only. Attached is a summary of plant operating conditions during sample collection at CWS and daily summaries of fish species impinged and their survival rates. The weights given in Table 2 are in kilograms.

SWS screen samples consisted of two 12-hour samples per day. These samples consisted of all fish impinged and found in the trash baskets located on the intake structure proper. These data are also summarized and attached.

MDL:aec

TABLE 1. START TIME AND DURATION OF IMPINGEMENT SAMPLES AT THE CIRCULATING WATER INTAKE, S.N.G.S., 18-29 APRIL 1977.
NUMBER OF PUMPS AND SCREENS IN OPERATION IS INDICATED.

DATE	SAMPLE START TIME		DURATION (MIN)	PUMPS	SCREENS
	UPPER	LOWER			
04/18/77	1218	1215	3	6	6
	1805	1800	3	6	6
04/19/77	0000	0003	3	6	6
	0600	0603	3	6	6
04/20/77	1204	1200	3	6	6
	1830	1825	3	6	6
	2355	2350	3	6	6
04/21/77	0603	0555	3	6	6
	1201	1158	3	6	6
	1804	1800	3	6	6
04/22/77	0006	0000	3	6	6
	0601	0600	3	6	6
04/25/77	1201	1159	3	5	5
	1804	1802	3	6	6
04/26/77	0000	0003	3	6	6
	0600	0601	3	5	5
04/27/77	1204	1157	3	5	5
	1800	1757	3	6	6
	0010	0001	3	5	5
04/28/77	0600	0604	3	5	5
	1200	1159	3	5	5
	1800	1756	3	5	5
	0000	0001	3	5	5
	0600	0601	3	5	5

TABLE 2. ESTIMATED NUMBER AND WEIGHT PER 24 HOURS AND MODAL AND MAXIMUM LENGTHS OF FISHES IMPINGED AT THE CIRCULATING WATER INTAKE 18-29 APRIL 1977. % SURVIVAL: L=LIVE; D=DEAD; D*=DAMAGED. S=NUMBER OF 3-MINUTE SAMPLES. CF=CATCH FREQUENCY (NUMBER OF SAMPLES IN WHICH THE SPECIES APPEARED).

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/18-19/77	A. ROSTRATA	UPPER LOWER	- - - - - -	- 480	- 678.8	- 4	- 2	- 66.83	- 80.65	- 511-515
	A. AESTIVALIS	UPPER LOWER	56 28 17 - - -	2160 18240	1939.9 15642.4	4 4	4 4	11.55 11.55	12.15 202.20	76-80, 86-90 81-85 271-276
	A. PSEUDOHARENGUS	UPPER LOWER	100 0 0 - - -	120 2400	240.0 2958.9	4 4	1 4	1.64 40.27	3.29 65.25	106-110 91-95 106-110 186-190
	A. MITCHILLI	UPPER LOWER	19 59 22 - - -	21240 90720	12744.1 60954.3	4 4	4 4	51.23 300.08	31.07 257.80	61-65 61-70 91-95 96-100
	H. NUHALIS	UPPER LOWER	100 0 0 - - -	240 480	277.1 391.9	4 4	2 3	5.38 9.95	6.80 7.99	- - 100-105 131-135
	M. MENIDIA	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 0.77	- 1.54	- 96-100 96-100
	M. AMERICANA	UPPER LOWER	76 6 18 - - -	2040 12720	2521.0 10991.2	4 4	4 4	69.96 511.74	111.80 389.29	111-120 141-145 161-165 236-240
	M. SAXATILIS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 1.79	- 3.58	- 106-110 106-110
	L. MACROCHIRUS	UPPER LOWER	- - - - - -	- 240	- 277.1	- 4	- 2	- 14.82	- 17.11	- - 146-150
	T. MACULATUS	UPPER LOWER	- - - - - -	- 240	- 480.0	- 4	- 1	- 18.43	- 36.86	- - 76-80
TOTAL		UPPER LOWER COMBINED		25800 125760 151560			140.53 1133.66 1274.19			

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/20-21/77	A. ROSTRATA	UPPER LOWER	100 0 0 - - -	120 -	240.0 -	4 -	1 -	4.32 -	8.64 -	301-305 301-305
	A. AESTIVALIS	UPPER LOWER	50 50 0 - - -	240 600	277.1 908.6	4 4	2 2	1.58 2.58	1.83 3.53	81-85 71-75 81-85 86-90
	A. PSEUDOHARENGUS	UPPER LOWER	- - - - - -	- 240	- 480.0	- 4	- 1	- 2.59	- 5.18	- 96-105 101-105
	A. MITCHILLI	UPPER LOWER	40 35 25 - - -	9000 18360	5449.9 19337.0	4 4	4 3	25.30 54.04	17.60 55.85	71-75 71-75 86-90 86-90
	I. PUNCTATUS	UPPER LOWER	100 0 0 - - -	120 -	240.0 -	4 -	1 -	1.03 -	2.06 -	81-85 - 81-85
	M. AMERICANA	UPPER LOWER	100 0 0 - - -	480 3840	960.0 5003.7	4 4	1 3	27.78 211.12	55.56 268.92	- 131-141, 166-170 81-85 191-195
	T. MACULATUS	UPPER LOWER	100 0 0 - - -	120 240	240.0 480.0	4 4	1 1	7.57 15.60	15.14 31.20	141-145 136-140 141-145 161-165
TOTAL		UPPER LOWER COMBINED		10080 23280 33360			67.58 285.93 353.51			

TABLE 2. (CONTINUED)

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/21-22/77	A. ROSTRATA	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 0.04	- 0.07	- 61-65 61-65
	A. AESTIVALIS	UPPER LOWER	100 0 0 - - -	120 840	240.0 819.8	4 4	1 3	0.62 4.45	1.25 4.63	76-80 76-80 81-85 91-95
	A. PSEUDOHARENGUS	UPPER LOWER	100 0 0 - - -	240 -	480.0 -	4 -	1 -	2.87 -	5.74 -	91-105 100-105
	A. MITCHILLI	UPPER LOWER	48 41 11 - - -	11160 22440	10460.4 28801.0	4 4	4 4	32.80 64.14	30.00 82.43	61-65 81-85 76-80 91-95
	I. CATUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 84.00	- 168.00	- 476-480 476-480
	I. NEBULOSUS	UPPER LOWER	100 0 0 - - -	120 -	240.0 -	4 -	1 -	3.72 -	7.44 -	141-145 141-145
	M. MENIDIA	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 0.79	- 1.58	- 91-95 91-95
	M. AMERICANA	UPPER LOWER	73 9 18 - - -	1320 3120	1725.1 3267.3	4 4	3 3	62.21 138.38	71.95 132.55	151-155 196-200 131-135 181-185
	M. SAXATILIS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 2.02	- 4.03	- 111-115 111-115
	L. GIBBOSUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 1.84	- 3.67	- 86-90 86-90
	T. MACULATUS	UPPER LOWER	100 0 0 - - -	120 720	240.0 919.1	4 4	1 2	6.42 34.61	12.84 45.63	146-150 146-150 - 146-150
	TOTAL	UPPER LOWER COMBINED		13080 27720 40800				108.64 330.27 438.91		

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/25-26/77	A. AESTIVALIS	UPPER LOWER	20 60 20 - - -	600 360	908.6 240.0	4 4	2 3	3.76 3.20	5.94 2.88	81-85 91-95 86-90 116-120
	A. PSEUDOHARENGUS	UPPER LOWER	- - - - - -	- 240	- 277.1	- 4	- 2	- 2.66	- 3.67	- 76-80, 111-115
	B. TYRANNUS	UPPER LOWER	0 100 0 - - -	120 720	240.0 619.7	4 4	1 3	23.95 114.67	47.90 96.45	221-225 221-225 191-196 231-235
	A. MITCHILLI	UPPER LOWER	31 58 12 - - -	14160 8880	4743.7 3337.1	4 4	4 4	38.80 27.31	18.90 9.01	61-65 91-95 71-75 86-90
	M. AMERICANA	UPPER LOWER	100 0 0 - - -	120 600	240.0 240.0	4 4	1 4	8.40 39.56	16.80 22.11	166-170 166-170 - 176-180
	L. MACROCHIRUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 62.64	- 12.53	- 131-135 131-135
	T. MACULATUS	UPPER LOWER	100 0 0 - - -	120 360	240.0 459.6	4 4	1 2	3.78 11.16	7.56 13.98	111-115 111-115 - 121-125
	TOTAL	UPPER LOWER COMBINED		15120 11280 26400				78.69 261.20 339.89		

IMPINGEMENT MONITORING PROGRAM
SALEM NUCLEAR GENERATING STATION, UNIT 1
PUBLIC SERVICE ELECTRIC & GAS COMPANY

TABLE 2. (CONTINUED)

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL			MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM)	
			L	D	D*							MODE	MAX
04/27-28/77	A. ROSTRATA	UPPER	0	100	0	120	240.0	4	1	14.00	28.00	416-420	416-420
		LOWER	-	-	-	120	240.0	4	1	13.14	26.28	396-400	396-400
	A. PSEUDOHARENGUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	1.48	2.95	96-100	96-100
	B. TYRANNUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	360	459.6	4	2	80.33	105.62	226-230	241-245
	A. PSEUDOHARENGUS	UPPER	100	0	0	120	240.0	4	1	1.64	3.29	106-110	106-110
		LOWER	-	-	-	2400	2958.9	4	4	40.27	65.25	91-95	186-190
	A. MITCHILLI	UPPER	19	59	22	21240	12744.1	4	4	51.23	31.07	61-65	91-95
		LOWER	-	-	-	90720	60954.3	4	4	300.08	257.80	61-70	96-100
	H. NUCHALIS	UPPER	100	0	0	240	277.1	4	2	5.38	6.80	-	100-105
		LOWER	-	-	-	480	391.9	4	3	9.95	7.99	-	131-135
	M. MENIDIA	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	0.77	1.54	96-100	96-100
	M. AMERICANA	UPPER	76	6	18	2040	2521.0	4	4	69.96	111.80	111-120	161-165
		LOWER	-	-	-	12720	10991.2	4	4	511.74	389.29	141-145	236-240
	M. SAXATILIS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	1.79	3.58	106-110	106-110
	L. MACROCHIRUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	277.1	4	2	14.82	17.11	-	146-150
	T. MACULATUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	480.0	4	1	18.43	36.86	-	76-80
TOTAL		UPPER				25800				140.53			
		LOWER				125760				1133.66			
		COMBINED				151560				1274.19			

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL			MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM)	
			L	D	D*							MODE	MAX
04/28-29/77	A. AESTIVALIS	UPPER	0	0	100	120	240.0	4	1	1.68	3.36	106-110	106-110
		LOWER	-	-	-	120	240.0	4	1	4.08	8.16	151-155	151-155
	A. PSEUDOHARENGUS	UPPER	100	0	0	120	240.0	4	1	2.34	4.68	111-115	111-115
		LOWER	-	-	-	120	240.0	4	1	1.70	3.41	106-110	106-110
	B. TYRANNUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	480	960.0	4	1	117.96	253.92	-	236-240
	A. MITCHILLI	UPPER	66	11	23	7440	5618.3	4	4	21.36	16.90	71-75	86-90
		LOWER	-	-	-	13560	18055.4	4	3	29.47	34.11	71-75	81-85
	M. MENIDIA	UPPER	100	0	0	120	240.0	4	1	0.80	1.61	96-100	96-100
		LOWER	-	-	-	-	-	-	-	-	-	-	-
	M. AMERICANA	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	720	619.7	4	3	29.47	34.11	-	196-200
	T. MACULATUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	277.0	4	2	9.19	11.03	116-120, 126-130	126-130
TOTAL		UPPER				7800				26.18			
		LOWER				15240				191.87			
		COMBINED				23040				218.05			

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TABLE 3. TOTAL NUMBER AND WEIGHT PER 24 HOURS AND MODAL AND MAXIMUM LENGTHS OF FISHES IMPINGED AT THE SERVICE WATER INTAKE, S.N.G.S., 18-29 APRIL 1977.

04/18-19/77 0830-0830 4					04/20-21/77 0900-0900 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		SPECIES	N	WT(G)	LENGTH(MM)	
			MODE	MAX				MODE	MAX
A. ROSTRATA	1	58.2	311-315	311-315	81	171.7	56-60	446-450	
A. AESTIVALIS	39	167.3	76-80	91-95	18	113.2	66-70	156-160	
A. PSEUDOHARENGUS	12	65.1	86-90	86-90	2	26.0	86-90,	111-115	
							111-115		
A. MITCHILLI	302	781.7	71-75	91-95	787	2214.5	76-80	86-90	
H. NUCHALIS	1	18.0	116-120	116-120	-	-	-	-	
U. CHUSS	1	32.1	206-210	206-210	-	-	-	-	
M. MARTINICA	-	-	-	-	3	21.7	101-105	101-105	
M. AMERICANA	18	614.8	131-135	181-185	7	378.5	121-125	181-185	
P. FLAVESCENS	-	-	-	-	1	137.9	231-235	231-235	
T. MACULATUS	1	24.8	111-115	111-115	2	76.5	106-110,	126-130	
							126-130		
TOTAL	375	1762.0			901	3140.0			
04/21-22/77 0900-0900 4					04/25-26/77 0830-0830 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		SPECIES	N	WT(G)	LENGTH(MM)	
			MODE	MAX				MODE	MAX
A. ROSTRATA	16	1122.7	56-60	501-505	7	767.0	-	396-400	
A. AESTIVALIS	10	84.6	71-75,	186-190	31	626.2	-	216-220	
			76-80						
A. PSEUDOHARENGUS	-	-	-	-	1	292.1	266-270	266-270	
A. SAPIDISSIMA	1	15.9	111-115	111-115	-	-	-	-	
B. TYRANNUS	-	-	-	-	3	232.0	26-30	206-210	
A. MITCHILLI	436	1083.6	71-75	91-95	705	2084.5	76-80	91-95	
R. MARGINATA	1	7.7	116-120	116-120	-	-	-	-	
M. MENIDIA	4	30.9	-	106-110	-	-	-	-	
M. AMERICANA	9	250.3	-	161-165	9	621.6	-	161-165	
L. GIBBOSUS	1	3.1	51-55	51-55	-	-	-	-	
P. FLAVESCENS	-	-	-	-	1	40.0	56-60	56-60	
T. MACULATUS	3	121.3	-	136-140	-	-	-	-	
TOTAL	481	2720.1			757	4663.4			
04/27-28/77 0830-0830 4					04/28-29/77 0830-0830 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		SPECIES	N	WT(G)	LENGTH(MM)	
			MODE	MAX				MODE	MAX
A. ROSTRATA	3	59.2	-	321-325	5	706.5	-	646-650	
A. AESTIVALIS	3	69.9	-	176-180	1	49.1	181-185	181-185	
A. PSEUDOHARENGUS	-	-	-	-	1	9.4	91-95	91-95	
B. TYRANNUS	2	194.1	31-35,	216-220	-	-	-	-	
			216-220						
A. MITCHILLI	196	528.0	66-70	86-90	124	381.7	71-75	86-90	
I. NEBULOSUS	-	-	-	-	1	64.6	176-180	176-180	
R. MARGINATA	2	34.3	56-60,	141-145	1	22.6	166-170	166-170	
			141-145						
M. MENIDIA	-	-	-	-	2	18.7	91-100	96-100	
M. AMERICANA	-	-	-	-	4	134.1	-	106-110	
L. MACROCHIRUS	1	16.6	96-100	96-100	-	-	-	-	
P. FLAVESCENS	-	-	-	-	1	40.1	151-155	151-155	
S. AGUOSUS	1	7.5	66-70	66-70	-	-	-	-	
T. MACULATUS	-	-	-	-	2	1350.0	106-110,	171-175	
							171-175		
TOTAL	208	909.6			142	277.68			

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The monitoring program at both locations was initiated on April 18, 1977 and consisted of three 24-hour sampling periods per week at the CWS. A comparable set of samples was collected at the SWS. The CWS screens were sampled four times per 24-hour period at approximately six-hour intervals. The samples were collected by diverting approximately three minutes of screen wash water to either the counting pool or inclined trash screen located on the north end of the CWS intake structure. Survival rates were calculated for pool samples only. Attached is a summary of plant operating conditions during sample collection at CWS and daily summaries of fish species impinged and their survival rates. The weights given in Table 2 are in kilograms.

SWS screen samples consisted of two 12-hour samples per day. These samples consisted of all fish impinged and found in the trash baskets located on the intake structure proper. These data are also summarized and attached.

MDL:aec

TABLE 1. START TIME AND DURATION OF IMPINGEMENT SAMPLES AT THE CIRCULATING WATER INTAKE, S.N.G.S., 18-29 APRIL 1977.
NUMBER OF PUMPS AND SCREENS IN OPERATION IS INDICATED.

DATE	SAMPLE START TIME		DURATION	PUMPS	SCREENS
	UPPER	LOWER	(MIN)		
04/18/77	1218	1215	3	6	6
	1805	1800	3	6	6
04/19/77	0000	0003	3	6	6
	0600	0603	3	6	6
04/20/77	1204	1200	3	6	6
	1830	1825	3	6	6
	2355	2350	3	6	6
04/21/77	0603	0555	3	6	6
	1201	1158	3	6	6
	1804	1800	3	6	6
04/22/77	0006	0000	3	6	6
	0601	0600	3	6	6
04/25/77	1201	1159	3	5	5
	1804	1802	3	6	6
04/26/77	0000	0003	3	6	6
	0600	0601	3	5	5
04/27/77	1204	1157	3	5	5
	1800	1757	3	6	6
	0010	0001	3	5	5
04/28/77	0600	0604	3	5	5
	1200	1159	3	5	5
	1800	1756	3	5	5
	0000	0001	3	5	5
04/29/77	0600	0601	3	5	5

TABLE 2. ESTIMATED NUMBER AND WEIGHT PER 24 HOURS AND MODAL AND MAXIMUM LENGTHS OF FISHES IMPINGED AT THE CIRCULATING WATER INTAKE 18-29 APRIL 1977. % SURVIVAL: L=LIVE; D=DEAD; D*=DAMAGED. S=NUMBER OF 3-MINUTE SAMPLES. CF=CATCH FREQUENCY (NUMBER OF SAMPLES IN WHICH THE SPECIES APPEARED).

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/18-19/77	A. ROSTRATA	UPPER LOWER	- - - - - -	- 480	- 678.8	- 4	- 2	- 66.83	- 80.65	- 511-515
	A. AESTIVALIS	UPPER	56 28 17	2160	1939.9	4	4	11.55	12.15	76-80, 86-90
		LOWER	- - -	18240	15642.4	4	4	11.55	202.20	81-85 271-276
	A. PSEUDOHARENGUS	UPPER	100 0 0	120	240.0	4	1	1.64	3.29	106-110
		LOWER	- - -	2400	2958.9	4	4	40.27	65.25	91-95 186-190
	A. MITCHILLI	UPPER	19 59 22	21240	12744.1	4	4	51.23	31.07	61-65 91-95
		LOWER	- - -	90720	60954.3	4	4	300.08	257.80	61-70 96-100
	H. NUCHALIS	UPPER	100 0 0	240	277.1	4	2	5.38	6.80	- 100-105
		LOWER	- - -	480	391.9	4	3	9.95	7.99	- 131-135
	M. MENIDIA	UPPER	- - -	-	-	-	-	-	-	-
		LOWER	- - -	120	240.0	4	1	0.77	1.54	96-100 96-100
	M. AMERICANA	UPPER	76 6 18	2040	2521.0	4	4	69.96	111.80	111-120 161-165
		LOWER	- - -	12720	10991.2	4	4	511.74	389.29	141-145 236-240
	M. SAXATILIS	UPPER	- - -	-	-	-	-	-	-	-
		LOWER	- - -	120	240.0	4	1	1.79	3.58	106-110 106-110
	L. MACROCHIRUS	UPPER	- - -	-	-	-	-	-	-	-
		LOWER	- - -	240	277.1	4	2	14.82	17.11	- 146-150
	T. MACULATUS	UPPER	- - -	-	-	-	-	-	-	-
		LOWER	- - -	240	480.0	4	1	18.43	36.86	- 76-80
TOTAL		UPPER		25800				140.53		
		LOWER		125760				1133.66		
		COMBINED		151560				1274.19		

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/20-21/77	A. ROSTRATA	UPPER	100 0 0	120	240.0	4	1	4.32	8.64	301-305 301-305
		LOWER	- - -	-	-	-	-	-	-	-
	A. AESTIVALIS	UPPER	50 50 0	240	277.1	4	2	1.58	1.83	81-85 81-85
		LOWER	- - -	600	908.6	4	2	2.58	3.53	71-75 86-90
	A. PSEUDOHARENGUS	UPPER	- - -	-	-	-	-	-	-	-
		LOWER	- - -	240	480.0	4	1	2.59	5.18	96-105 101-105
	A. MITCHILLI	UPPER	40 35 25	9000	5449.9	4	4	25.30	17.60	71-75 86-90
		LOWER	- - -	18360	19337.0	4	3	54.04	55.85	71-75 86-90
	I. PUNCTATUS	UPPER	100 0 0	120	240.0	4	1	1.03	2.06	81-85 81-85
		LOWER	- - -	-	-	-	-	-	-	-
	M. AMERICANA	UPPER	100 0 0	480	960.0	4	1	27.78	55.56	- 81-85
		LOWER	- - -	3840	5003.7	4	3	211.12	268.92	131-141, 166-170 191-195
	T. MACULATUS	UPPER	100 0 0	120	240.0	4	1	7.57	15.14	141-145 141-145
		LOWER	- - -	240	480.0	4	1	15.60	31.20	136-140 161-165
TOTAL		UPPER		10080				67.58		
		LOWER		23280				285.93		
		COMBINED		33360				353.51		

TABLE 2. (CONTINUED)

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/21-22/77	A. ROSTRATA	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 0.04	- 0.07	- 61-65 61-65
	A. AESTIVALIS	UPPER LOWER	100 0 0 - - -	120 840	240.0 819.8	4 4	1 3	0.62 4.45	1.25 4.63	76-80 76-80 81-85 91-95
	A. PSEUDOHARENGUS	UPPER LOWER	100 0 0 - - -	240 -	480.0 -	4 -	1 -	2.87 -	5.74 -	91-105 100-105
	A. MITCHILLI	UPPER LOWER	48 41 11 - - -	11160 22440	10460.4 28801.0	4 4	4 4	32.80 64.14	30.00 82.43	61-65 81-85 76-80 91-95
	I. CATUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 84.00	- 168.00	- 476-480 476-480
	I. NEBULOSUS	UPPER LOWER	100 0 0 - - -	120 -	240.0 -	4 -	1 -	3.72 -	7.44 -	141-145 141-145
	M. MENIDIA	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 0.79	- 1.58	- 91-95 91-95
	M. AMERICANA	UPPER LOWER	73 9 18 - - -	1320 3120	1725.1 3267.3	4 4	3 3	62.21 138.38	71.95 132.55	151-155 196-200 131-135 181-185
	M. SAXATILIS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 2.02	- 4.03	- 111-115 111-115
	L. GIBBOSUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 1.84	- 3.67	- 86-90 86-90
	T. MACULATUS	UPPER LOWER	100 0 0 - - -	120 720	240.0 919.1	4 4	1 2	6.42 34.61	12.84 45.63	146-150 146-150 - 146-150
	TOTAL	UPPER LOWER COMBINED		13080 27720 40800				108.64 330.27 438.91		

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL L D D*	MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM) MODE MAX
04/25-26/77	A. AESTIVALIS	UPPER LOWER	20 60 20 - - -	600 360	908.6 240.0	4 4	2 3	3.76 3.20	5.94 2.88	81-85 91-95 86-90 116-120
	A. PSEUDOHARENGUS	UPPER LOWER	- - - - - -	- 240	- 277.1	- 4	- 2	- 2.66	- 3.67	- 76-80, 111-115
	B. TYRANNUS	UPPER LOWER	0 100 0 - - -	120 720	240.0 619.7	4 4	1 3	23.95 114.67	47.90 96.45	221-225 221-225 191-196 231-235
	A. MITCHILLI	UPPER LOWER	31 58 12 - - -	14160 8880	4743.7 3337.1	4 4	4 4	38.80 27.31	18.90 9.01	61-65 91-95 71-75 86-90
	M. AMERICANA	UPPER LOWER	100 0 0 - - -	120 600	240.0 240.0	4 4	1 4	8.40 39.56	16.80 22.11	166-170 166-170 - 176-180
	L. MACROCHIRUS	UPPER LOWER	- - - - - -	- 120	- 240.0	- 4	- 1	- 62.64	- 12.53	- 131-135 131-135
	T. MACULATUS	UPPER LOWER	100 0 0 - - -	120 360	240.0 459.6	4 4	1 2	3.78 11.16	7.56 13.98	111-115 111-115 - 121-125
	TOTAL	UPPER LOWER COMBINED		15120 11280 26400				78.69 261.20 339.89		

IMPINGEMENT MONITORING PROGRAM
SALEM NUCLEAR GENERATING STATION, UNIT 1
PUBLIC SERVICE ELECTRIC & GAS COMPANY

TABLE 2. (CONTINUED)

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL			MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM)	
			L	D	D*							MODE	MAX
04/27-28/77	A. ROSTRATA	UPPER	0	100	0	120	240.0	4	1	14.00	28.00	416-420	416-420
		LOWER	-	-	-	120	240.0	4	1	13.14	26.28	396-400	396-400
	A. PSEUDOHARENGUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	1.48	2.95	96-100	96-100
	B. TYRANNUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	360	459.6	4	2	80.33	105.62	226-230	241-245
	A. PSEUDOHARENGUS	UPPER	100	0	0	120	240.0	4	1	1.64	3.29	106-110	106-110
		LOWER	-	-	-	2400	2958.9	4	4	40.27	65.25	91-95	186-190
	A. MITCHILLI	UPPER	19	59	22	21240	12744.1	4	4	51.23	31.07	61-65	91-95
		LOWER	-	-	-	90720	60954.3	4	4	300.08	257.80	61-70	96-100
	H. NUCHALIS	UPPER	100	0	0	240	277.1	4	2	5.38	6.80	-	100-105
		LOWER	-	-	-	480	391.9	4	3	9.95	7.99	-	131-135
	H. MENIDIA	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	0.77	1.54	96-100	96-100
	H. AMERICANA	UPPER	76	6	18	2040	2521.0	4	4	69.96	111.80	111-120	161-165
		LOWER	-	-	-	12720	10991.2	4	4	511.74	389.29	141-145	236-240
	M. SAXATILIS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	120	240.0	4	1	1.79	3.58	106-110	106-110
	L. MACROCHIRUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	277.1	4	2	14.82	17.11	-	146-150
	T. MACULATUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	480.0	4	1	18.43	36.86	-	76-80
TOTAL		UPPER				25800				140.53			
		LOWER				125760				1133.66			
		COMBINED				151560				1274.19			

DATE	SPECIES	LOCATION (SLUICE)	% SURVIVAL			MEAN NUM. /24 HRS	STANDARD DEVIATION	S	CF	MEAN WEIGHT /24 HRS	STANDARD DEVIATION	LENGTH(MM)	
			L	D	D*							MODE	MAX
04/28-29/77	A. AESTIVALIS	UPPER	0	0	100	120	240.0	4	1	1.68	3.36	106-110	106-110
		LOWER	-	-	-	120	240.0	4	1	4.08	8.16	151-155	151-155
	A. PSEUDOHARENGUS	UPPER	100	0	0	120	240.0	4	1	2.34	4.68	111-115	111-115
		LOWER	-	-	-	120	240.0	4	1	1.70	3.41	106-110	106-110
	B. TYRANNUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	480	960.0	4	1	117.96	253.92	-	236-240
	A. MITCHILLI	UPPER	66	11	23	7440	5618.3	4	4	21.36	16.90	71-75	86-90
		LOWER	-	-	-	13560	18055.4	4	3	29.47	34.11	71-75	81-85
	H. MENIDIA	UPPER	100	0	0	120	240.0	4	1	0.80	1.61	96-100	96-100
		LOWER	-	-	-	-	-	-	-	-	-	-	-
	H. AMERICANA	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	720	619.7	4	3	29.47	34.11	-	196-200
	T. MACULATUS	UPPER	-	-	-	-	-	-	-	-	-	-	-
		LOWER	-	-	-	240	277.0	4	2	9.19	11.03	116-120, 126-130	126-130
TOTAL		UPPER				7800				26.18			
		LOWER				15240				191.87			
		COMBINED				23040				218.05			

SCAN:374

TABLE 3. TOTAL NUMBER AND WEIGHT PER 24 HOURS AND MODAL AND MAXIMUM LENGTHS OF FISHES IMPINGED AT THE SERVICE WATER INTAKE, S.N.G.S., 18-29 APRIL 1977.

04/18-19/77 0830-0830 4					04/20-21/77 0900-0900 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		N	WT(G)	LENGTH(MM)		
			MODE	MAX			MODE	MAX	
A. ROSTRATA	1	58.2	311-315	311-315	81	171.7	56-60	446-450	
A. AESTIVALIS	39	167.3	76-80	91-95	18	113.2	66-70	156-160	
A. PSEUDOHARENGUS	12	65.1	86-90	86-90	2	26.0	86-90,	111-115	
							111-115		
A. MITCHILLI	302	781.7	71-75	91-95	787	2214.5	76-80	86-90	
H. NUCHALIS	1	18.0	116-120	116-120	-	-	-	-	
U. CHUSS	1	32.1	206-210	206-210	-	-	-	-	
M. MARTINICA	-	-	-	-	3	21.7	101-105	101-105	
H. AMERICANA	18	614.8	131-135	181-185	7	378.5	121-125	181-185	
P. FLAVESCENS	-	-	-	-	1	137.9	231-235	231-235	
T. MACULATUS	1	24.8	111-115	111-115	2	76.5	106-110,	126-130	
							126-130		
TOTAL	375	1762.0			901	3140.0			

04/21-22/77 0900-0900 4					04/25-26/77 0830-0830 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		N	WT(G)	LENGTH(MM)		
			MODE	MAX			MODE	MAX	
A. ROSTRATA	16	1122.7	56-60	501-505	7	767.0	-	396-400	
A. AESTIVALIS	10	84.6	71-75,	186-190	31	626.2	-	216-220	
			76-80						
A. PSEUDOHARENGUS	-	-	-	-	1	292.1	266-270	266-270	
A. SAPIDISSIMA	1	15.9	111-115	111-115	-	-	-	-	
B. TYRANNUS	-	-	-	-	3	232.0	26-30	206-210	
A. MITCHILLI	436	1083.6	71-75	91-95	705	2084.5	76-80	91-95	
R. MARGINATA	1	7.7	116-120	116-120	-	-	-	-	
M. MENIDIA	4	30.9	-	106-110	-	-	-	-	
M. AMERICANA	9	250.3	-	161-165	9	621.6	-	161-165	
L. GIRROSUS	1	3.1	51-55	51-55	-	-	-	-	
P. FLAVESCENS	-	-	-	-	1	40.0	56-60	56-60	
T. MACULATUS	3	121.3	-	136-140	-	-	-	-	
TOTAL	481	2720.1			757	4663.4			

04/27-28/77 0830-0830 4					04/28-29/77 0830-0830 4				
DATE TIME NO. OF PUMPS									
SPECIES	N	WT(G)	LENGTH(MM)		N	WT(G)	LENGTH(MM)		
			MODE	MAX			MODE	MAX	
A. ROSTRATA	3	59.2	-	321-325	5	706.5	-	646-650	
A. AESTIVALIS	3	69.9	-	176-180	1	49.1	181-185	181-185	
A. PSEUDOHARENGUS	-	-	-	-	1	9.4	91-95	91-95	
B. TYRANNUS	2	194.1	31-35,	216-220	-	-	-	-	
			216-220						
A. MITCHILLI	196	528.0	66-70	86-90	124	381.7	71-75	86-90	
I. NEBULOSUS	-	-	-	-	1	64.6	176-180	176-180	
R. MARGINATA	2	34.3	56-60,	141-145	1	22.6	166-170	166-170	
			141-145						
M. MENIDIA	-	-	-	-	2	18.7	91-100	96-100	
M. AMERICANA	-	-	-	-	4	134.1	-	106-110	
L. MACROCHIRUS	1	16.6	96-100	96-100	-	-	-	-	
P. FLAVESCENS	-	-	-	-	1	40.1	151-155	151-155	
S. AQUOSUS	1	7.5	66-70	66-70	-	-	-	-	
T. MACULATUS	-	-	-	-	2	1350.0	106-110,	171-175	
							171-175		
TOTAL	208	909.6			142	277.68			

IMPROVEMENT MONITORING PROGRAM
SALEM NUCLEAR GENERATING STATION, UNIT 1
PUBLIC SERVICE ELECTRIC & GAS COMPANY