Docket File

JUN 11 1973

Docket No. 50-286

ENVIRON, FILE (NEPA)

Daniel R. Muller, Assistant Director for Environmental Projects, L

INDIAN POINT NUCLEAR GENERATING PLANT, UNIT 3 - REVISED RADWASTE SECTION FOR ENVIRONMENTAL STATEMENT AND SOURCE TERM CHANGE

Plant Name: Indian Point Nuclear Generating Plant, Unit 3
Licensing Stage: OL
Docket Number: 50-286
Responsible Branch: Environmental Projects Branch #1
Project Leader: M. J. Oestmann
Requested Completion Date: Not available
Description of Responses: Revised Radwaste Section for ES and Source Term Change
Review Status: Completed

Enclosed are the revised radwaste section and source term for Indian Point Unit 3, which supersede those sent to you on July 14, 1972. The revision reflects the fact that Unit 2 steam generator blowdown treatment and the auxiliary building charcoal adsorber modifications will not be completed until after the Unit 3 startup, and thus affecting the radioactive releases from the site during this interim period.

On the basis of our review, the calculated performance of the radioactive waste treatment system as described in the FSAR will not meet our "as low as practicable" guidelines, because the plant does not have the capability to treat the steam generator blowdown continuously. The applicant has been informed of this deficiency and has verbally indicated his intent to modify the system.

Our evaluation is based on the system as described in the FSAR. We understand the applicant is considering to delay the installation of some of

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the radioactive waste treatment facilities. Any delay in the installation of treatment facilities described in the FSAR would require our reevaluation of this system.

Original signed by:
Robert L. Tedesco

R. L. Tedesco, Assistant Director
for Containment Safety
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As stated

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RADWASTE SECTION FOR ENVIRONMENTAL STATEMENT
INDIAN POINT NUCLEAR GENERATING PLANT UNIT NO. 3

3.5 Radioactive Waste

The operation of Indian Point Nuclear Generating Plant, Unit 3 will result in the production of radioactive fission products, the bulk of which will remain within the cladding of the fuel rods. Small amounts of these fission products will escape from the fuel cladding into the primary coolant. In addition, some radioactive materials will be produced as a result of neutron activation of corrosion products in the coolant. Some of these materials in low concentrations may be released in liquids to the Hudson River or released into the atmosphere as gases under controlled conditions after appropriate treatment, sampling and monitoring. The radioactivity that may be released during operation of the plant at full power will be in accordance with the Commission's regulations, as set forth in 10 CFR Part 20 and 10 CFR Part 50. Based on our evaluation of the gaseous waste treatment system as currently proposed, we conclude that the calculated radiation dose rates from the radioiodine released will exceed our as low as practicable guidelines. This is based on the grass-cow-milk pathway to the thyroid of a two-year-old child. The cow is located 7 miles SSW from the plant.

At the Indian Point Nuclear Generating Plant, Units 1, 2 and 3 have independent waste handling and treatment facilities except for common steam generator blowdown and laundry facilities provided by Unit 1. The waste handling and treatment systems for Unit 1 are described in the applicant's Hazards Summary Report for Unit 1 dated January 1960 and supplements. The waste handling and treatment systems installed in Unit No. 2 are described in the applicant's Final Safety Analysis Report dated September 9 and supplements.

The radioactive waste handling and treatment systems for the Indian Point Nuclear Generating Unit No. 3 are described in the Final Safety Analysis Report, and the Environmental Report and supplements. These systems are designed to collect and process the liquid, gaseous, and solid wastes that might contain radioactive materials. The principal conditions and parameters used in calculating the releases of radioactivity from Unit No. 3 are summarized in Tables 3.5.1 and 3.5.2. The waste treatment facilities for Unit No. 3 are similar in all respects to those provided for the proposed modified treatment systems for Unit No. 2.

The following evaluation is based on our model, adjusted to apply to this plant and uses somewhat different operating conditions. Our calculated effluent releases are, therefore, different from the applicant's; however, the model used results from a review of available data from operating reactors.

Based on our evaluation of the gaseous radioactive waste treatment systems for Indian Point Unit No. 3, we have concluded that our calculated radiation dose rates from the radioiodine released in the gaseous effluents will exceed our "as low as practicable" guidelines. This is principally due to the intermittent capability for treatment of the steam vented from the steam generator blowdown flash tank at Unit 1. The applicant has been informed that continuous capability for treatment of the steam generator blowdown will be required.

3.5.1 Liquid Wastes

The liquid radioactive waste treatment systems for Unit 3 will include reactor coolant treatment, waste disposal and steam generator blowdown.

The reactor coolant treatment system will process deaerated liquids from reactor coolant letdown and from equipment leaks. Batches will be processed by cation demineralization, filtration, gas stripping and evaporation. The condensate from the evaporator will be processed through an anion demineralizer and routed to the monitoring tanks. After sampling and analysis, the waste will be either recycled for additional treatment, returned to the reactor coolant system for reuse, or released to the condenser circulating water duct. The boron concentrate from the evaporator will either be recycled to the reactor coolant system, or pumped to the solid waste system and packaged as solid waste. In our evaluation we assumed that 90% will be returned to the plant for reuse and that 10% of the condensate will be released through the condensate circulating water duct to the Hudson River.

The liquid waste treatment system will process the equipment, floor, laboratory and sampling drains along with demineralizer regenerant and decontamination solutions. These wastes will be collected in the waste holdup tank and batch processed through a filter and a 2-gpm evaporator. The condensate will be collected in the waste condensate tanks and recycled if required. We assumed that after sampling and analysis, all the condensate will be released to the condenser circulating water duct. The evaporator concentrate will be sent to solid waste.

The steam generator blowdown from Unit No. 3 will be processed through Unit 1 steam generator blowdown purification system. This system will consist of a flash tank, heat exchanger and mixed bed demineralizer. Effluent will be released to the condenser circulating water duct. The steam and noncondensibles from the flash tank will be routed to the main condenser in Unit No. 1. The discharge line to the water duct will be monitored. Our evaluation for Unit 3 was based on a steam generator blowdown rate of 10 gpm.

However, the applicant has stated that this may be increased to 50 gpm. This increase will have no significant effect on the radioactivity released in the liquid waste from Unit 3.

The turbine building drains will be discharged to the condenser circulating water duct without treatment.

Based on our evaluation of the modified liquid waste treatment systems for Unit 3, annual releases of radioactive materials, excluding tritium, in liquid effluents discharged to the Hudson River were calculated to be a fraction of those shown in Table 3.5-3. However, to compensate for expected operational occurrences and equipment downtime, the values have been normalized from 2.3 Ci/yr to 5 Ci/yr.

Based on the experience of operating PWRs, the tritium releases from Unit 3 were estimated to be about 350 Ci/yr. The applicant's estimated releases for Unit 3 were 610 Ci/yr of tritium and 9.6 Ci/yr for all other radionuclides.

Based on our evaluation, we conclude that the radioactive liquid waste treatment systems for Unit 3 will be adequate to meet our "as low as practicable" guidelines.

Combined Releases of Radioactive Materials in Liquid Wastes from Units 1, 2 and 3

We have calculated the total radioactivity released from the liquid waste treatment systems to the Hudson River for Indian Point Units 1, 2 and 3 to be less than 15 Ci/yr for all radionuclides except tritium. We assumed the steam generator blowdown for Units 1, 2 and 3 will flow to the Unit 1 system for treatment of the blowdown from all three units. The releases of radionuclides from Units 1, 2 and 3 were normalized from 2.3 Ci/yr/unit to 5 Ci/yr/unit to compensate for expected operational occurrences and equipment downtime.

Based on the experience of similar operating PWRs, we have estimated that the total tritium release from all three units will be approximately 2200 Ci/yr. The applicant has estimated releases for radioactive material in liquid wastes from all three units will be 20 Ci/yr, excluding tritium, and 2200 Ci/yr of tritium. Based on our evaluation, we conclude that the radioactive liquid waste treatment systems for Units 1, 2, and 3 will be adequate to meet our "as low as practicable" guidelines.

For approximately one year of the combined operation of Units 1, 2, and 3, Unit 2 will operate with the blowdown stream untreated. During that period, we calculate that the release of radioactive material, excluding tritium, will be 22 Ci/yr. It is possible that until the blowdown modification at Unit 2 is completed, the release of radioactive material could exceed our "as low as practicable" guidelines. However, the applicant will be required to monitor the environment and evaluate the results.

3.5.2 Gaseous Waste

During power operation of Indian Point Unit 3, radioactive materials released to the atmosphere in gaseous effluents will include low concentrations of fission product noble gases (krypton and xenon), halogens (mostly iodines), tritium contained in water vapor, and particulate material including both fission products and activated corrosion products. The gaseous waste treatment systems will include gas process, containment purge, condenser air ejector, the steam generator blowdown vent, and ventilation for the turbine, auxiliary and fuel storage buildings. The gaseous waste treatment system and ventilation exhaust points are shown schematically in Figure 3.5-2.

The gas processing system will provide treatment for the gases stripped from the reactor coolant along with the displaced cover gases from equipment in the CVCS system and the waste evaporator. In addition the total CVCS and reactor coolant system will be degassed prior to refueling, and during cold shutdowns. The collected gases will be compressed to 110 psig and held in four

(525 cubic feet each) storage tanks for decay before release. A portion of the gas will be returned to the CVCS holdup tanks. The gases stripped prior to refueling or during a cold shutdown will be compressed and stored in six (40 cubic feet each) storage tanks. The gas released from the decay tanks will be combined with ventilation air exhausted from the auxiliary building and discharged to the atmosphere through the unit vent. Assuming normal operation and two complete primary system degassings per year we have determined that the gas processing system is adequate to provide a holdup time of 45 days.

Small amounts of radioactive gases from the reactor coolant leakage will accumulate in the reactor containment. Prior to purging the containment air will be recirculated through an internal cleanup system consisting of HEPA filters and charcoal adsorbers at the rate of 16,000 scfm, to reduce the iodine concentration. Following this, the gas will be released to the plant vent through HEPA filters and charcoal adsorber. In our evaluation, we assumed recirculation for 16 hr before purging and four reactor containment building purges per year.

The ventilation systems for the auxiliary and spent fuel storage buildings have been designed to ensure that air flow will be from areas of low potential to areas having a greater potential for release of airborne radioactivity. The auxiliary building exhaust system will draw air from the equipment rooms and open areas of the building through HEPA filters and charcoal adsorbers, and released to the atmosphere through the reactor building vent. The ventilation air from the fuel storage buildings will be drawn through HEPA filters before being discharged through the reactor building ventilation system.

Ventilation air from the turbine building will be released through wall and roof exhaust fans without treatment.

Offgas from the condenser air ejectors containing radioactivity from primary to secondary system leakage in the steam generator will be vented to the atmosphere through the plant vent without treatment.

The offgas from the Unit 3 steam generator blowdown will be released through the flash tank and main condenser in Unit No. 1 to the Unit No. 1 superheater stack. When Unit 1 is not operating, the flash tank vapor will be released directly to the atmosphere through the existing Unit 1 roof vent. Based on the operating history of Unit 1, we considered that the steam generator blowdown vapor from Unit 3 will be released directly to the atmosphere 33% of the time. Our evaluation for Unit 3 was based on a steam generator blowdown rate of 10 gpm. However, the applicant has stated that this may be increased to 50 gpm. This reduces the radioiodine released from Unit 3 in the gaseous effluent by approximately 20%.

Based on our evaluation of the Indian Point Unit 3 gaseous waste treatment system, we have estimated that the annual release of radioactivity discharged to the atmosphere will be approximately 2700 Ci/yr of noble gases and 0.41 Ci/yr of iodine-131 as shown in Table 3.5-3. The applicant indicated approximately 5500 Ci/yr noble gases and 0.16 Ci/yr iodine-131 will be released to the environment.

Based on our evaluation of the gaseous radioactive waste treatment systems for Indian Point Unit No. 3, we conclude that our calculated radiation dose rates for the radioiodine released in the gaseous effluents will exceed our "as low as practicable" guidelines. This is principally due to the lack of capability for the continuous treatment of the steam generator blowdown.

<u>Unit 1, 2 and 3 Releases of Radioactive Gaseous Waste</u>

We have calculated that the total radioactivity released from the modified gaseous waste treatment systems to the atmosphere for Indian Point Nuclear Generating Plant, Units 1, 2 and 3 will be approximately 6600 Ci/yr noble gases and 0.88 Ci/yr iodine-131. The applicant estimated that the combined releases of radioactive material from Units 1, 2 and 3 will be 11,000 Ci/yr of noble gases and 0.32 Ci/yr of iodine-131.

Based on our evaluation of the gaseous radioactive waste treatment of Units 1, 2 and 3, we conclude that the releases could be in excess of our "as low as practicable" guidelines. This is principally due to the intermittent treatment capability for the blowdown vapor at Unit 1. The applicant has been informed that continuous blowdown treatment capability will be required. For about one year of the combined operation of Units 1, 2 and 3, Unit 2 will operate with the blowdown stream and ventilation exhaust from the primary auxiliary building untreated. During that period, we calculate that the radioiodine release rate with continuous treatment of Units 1 and 3 blowdown will result in calculated radiation doses that exceed our "as low as practicable" guidelines. However, the applicant will be required to monitor the environment and evaluate the results.

3.5.3 Solid Waste

The solid wastes from the reactor operations include the evaporator concentrates from the liquid waste processing system along with spent resins and filter sludge and air filters, miscellaneous paper, and rags. The evaporator concentrates will be solidified

Table 3.5-1

PRINCIPAL CONDITIONS AND PARAMETERS USED IN CALCULATING RELEASES OF RADIOACTIVE EFFLUENTS FOR INDIAN POINT NUCLEAR GENERATING PLANT UNIT NO. 3

Reactor Power	3216 MWt
Plant Factor	0.8
Failed Fuel*	0.25%
Primary Coolant System	
Total Mass	520,000 lb
Flowrate to Boron Recovery	14,000 gpd
Leak to Secondary Coolant	20 gpd
Leak to Containment Bldg.	40 gpd
Leak to Auxiliary Bldg.	20 gpd
System Volume	12,000 ft^3
System Degassing	2/yr
Secondary Coolant System	
Number of Steam Generators	4
Steam in Each Generator	4,800 lb
Liquid in Each Generator	82,000 lb
Total Coolant Mass	3,700,000 lb
Steam Generator Blowdown Rate	10 gpm
Condensate Flowrate	13,000,000 lb/hr
Steam Leak to Turbine Bldg.	5 gpm
Condenser Circulating Water Flowrate	870,000 gpm
Containment	
Volume	2,600,000 ft^3
Purges	4/yr
Kidney Charcoal Adsorber Flowrate	16,000 cfm

*This value is constant and corresponds to 0.25% of the operating power fission product source term.

Table 3.5-1 (contined)

Iodine Partition Coefficients (Gas/Liquid)	
Primary Coolant	
Leakage to Containment	0.1
Leakage to Auxiliary Bldg.	0.0001
Secondary Coolant	
Steam Generator	0.1
Condenser Air Ejector	0.0005
Iodine Decontamination Factor	
Reactor Containment Bldg. Ventilation - Charcoal Adsorber	10

Table 3.5-2

PRINCIPAL ASSUMPTIONS AND PARAMETERS FOR LIQUID WASTE TREATMENT SYSTEMS FOR INDIAN POINT UNIT NO. 3

System	Waste Feed (gpd)	Rad Conc (% PCA)	Capacity[a/] Holdup Tanks (gal)	Capacity[a/] Process (gpd)	Delay Time (days)	Decontamination Factors I	Decontamination Factors Cs, Rb	Decontamination Factors Cation	Decontamination Factors Anion	Processed Effluent Released (%)
Primary Coolant System[b/]										
CVCS	110,000	100			-	10	1	10	10	0
Boron Recovery	15,000	10	229,000	43,000	3	10^4	$2x10^3$	10^5	10^5	10
Dirty Waste	470	100	29,000	2,900	3	10^3	10^4	10^4	10^4	100
Steam Generator Blowdown	14,000	10	300,000[c/]	35,000[c/]	-	10^2	2	10^2	10^2	100
Turbine Bldg. Drain	7,200	0.1	-	none	-	-	-	-	-	100

a/ Rated capacity; practical operating capacity reduced by filter backwashing, demineralizer regeneration, evaporator bottoms discharge, and recycling off-specification products.

b/ Holdup decontamination factors in reactor coolant system for Mo and Tc (100), for Y(10).

c/ Modified Unit 1 system providing service for Units 1, 2 and 3.

Table 3.5-3

CALCULATED ANNUAL RELEASE OF RADIOACTIVITY IN LIQUID EFFLUENT
FROM INDIAN POINT UNITS 1, 2 and 3
(MODIFIED BASIS)

Nuclide	Ci/yr
Rb-86	0.0033
Rb-88	0.081
Sr-89	0.00041
Sr-90	0.000015
Sr-91	0.00014
Y-90	0.00011
Y-91m	0.00074
Y-91	0.033
Y-93	0.00024
Zr-95	0.000068
Zr-97	0.000013
Nb-95	0.000066
Nb-97m	0.000013
Nb-97	0.000015
Mo-99	0.4
Tc-99m	0.33
Ru-103	0.000049
Ru-106	0.000015
Rh-103m	0.000049
Rh-105	0.000015
Rh-106	0.000015
Te-125m	0.000041
Te-127m	0.00032
Te-127	0.00044
Te-129m	0.0032
Te-129	0.0021
Te-131m	0.0012
Te-131	0.00023
Te-132	0.021
I-130	0.0015
I-131	0.89
I-132	0.084
I-133	0.48
I-135	0.096
Cs-134	1.17
Cs-136	0.48
Cs-137	0.89
Ba-137m	0.22
Ba-140	0.00046
La-140	0.00031

Nuclide	Ci/yr
Ce-141	0.000075
Ce-143	0.000024
Ce-144	0.000043
Pr-143	0.000060
Pr-144	0.000043
Nd-147	0.000024
Pm-147	0.000006
Cr-51	0.0012
Mn-54	0.00043
Fe-55	0.0013
Fe-59	0.00041
Co-58	0.012
Co-60	0.0013
Np-239	0.00039

Total ∿ 5 Ci/yr

H-3 ∿ 350 Ci/yr*
1500 Ci/yr**

*For Units 2 and 3
**For Unit 1 (based on operating experience)

Table 3.5-4

CALCULATED ANNUAL RELEASE OF RADIOACTIVE NUCLIDES IN GASEOUS EFFLUENT FROM INDIAN POINT UNITS 2 & 3 (MODIFIED)

	Discharge Rate (Ci/yr/Unit)						
				Gas Processing System	Steam Generator Leak		
Isotope	Containment Purge	Auxiliary Building	Turbine Building	for 45-Day Decay	Air Ejector	Blowdown Tank Vent	Total
Kr-83m	a	1	a	a	1	a	2
Kr-85m	a	6	a	a	6	a	12
Kr-85	2	1	a	870	1	a	870
Kr-87	a	3	a	a	3	a	6
Kr-88	a	11	a	a	11	a	22
Xe-131m	1	2	a	81	2	a	86
Xe-133m	a	9	a	a	9	a	18
Xe-133	88	530	a	470	530	a	1600
Xe-135m	a	1	a	a	1	a	2
Xe-135	a	17	a	a	17	a	34
Xe-137	a	1	a	a	1	a	2
Xe-138	a	2	a	a	2	a	4
Total Noble Gases	91	580	a	1500	580	a	2700
I-131	0.027	0.05	0.04	a	0.13	0.16[b]	0.41
I-133	0.027	0.07	0.02	a	0.066	0.08	0.27

a - Means less than 1 Ci/yr of noble gases or less than 10^{-4} Ci/yr of iodine.
b - Blowdown released from Unit 1, all ground releases.

Table 3.5-5

CALCULATED RADIOACTIVITY RELEASES IN EFFLUENTS FROM INDIAN POINT UNITS 1, 2 AND 3

Unit No.	Power (MWt)	Liquids (Ci/yr) Radionuclides	Liquids (Ci/yr) Tritium	Gases (Ci/yr) Noble Gases	Gases (Ci/yr) I-131
			Unit 2 Present System		
1	615	5	1500	1200	0.06
2	2758	22	350	3000	0.64
3	3216	5	350	2700	0.41
		32	2200	7900	1.11
			After Unit 2 Modifications		
1	615	5	1500	1200	0.06
2	3216	5	350	2700	0.41
3	3216	5	350	2700	0.41
		15	2200	6600	0.88

Table 3.5-6

CALCULATED ANNUAL RELEASE OF RADIOACTIVE MATERIAL IN LIQUID EFFLUENT FROM INDIAN POINT UNIT NO. 2 (PRESENT SYSTEM)

Nuclide	Steam Generator Blowdown (Ci/yr/unit)	Reactor Coolant Treatment (Ci/yr/unit)	Waste Disposal System (Ci/yr/unit)
Rb-86	0.0030	--	--
Rb-88	0.075	--	--
Sr-89	0.016	--	0.00002
Sr-90	0.00042	--	--
Sr-91	0.005	--	--
Y-90	0.00002	--	--
Y-91m	0.003	--	--
Y-91	0.00025	0.00010	--
Y-93	0.00001	--	--
Zr-95	0.002	--	--
Nb-95	0.002	--	--
Mo-99	0.011	0.0047	0.00008
Tc-99m	0.010	0.0045	0.00008
Ru-103	0.002	--	--
Ru-106	0.0004	--	--
Rh-103m	0.002	--	--
Rh-105	0.0005	--	--
Rh-106	0.0004	--	--
Te-125m	0.001	--	--
Te-127m	0.011	--	0.00002
Te-127	0.015	--	0.00002
Te-129	0.035	--	0.00005
Te-131m	0.042	--	0.00003
Te-131	0.008	--	0.00001
Te-132	0.75	0.00006	0.00095
I-130	0.17	--	0.00002
I-131	9.6	0.0075	0.14
I-132	0.92	0.00006	0.00095
I-133	5.4	0.021	0.021
I-135	1.2	0.00008	0.00013
Cs-134	0.93	0.0034	0.0015
Cs-136	0.44	0.0067	0.00067
Cs-137	0.76	0.0028	0.0012
Ba-137m	0.72	0.0026	0.0012
Ba-140	0.017	--	0.00003
La-140	0.012	--	0.00002

Table 3.5-6 (Continued)

Nuclide		Steam Generator Blowdown (Ci/yr/unit)	Reactor Coolant Treatment (Ci/yr/unit)	Waste Disposal System (Ci/yr/unit)
Ce-141		0.003	--	--
Ce-144		0.001	--	--
Pr-143		0.002	--	--
Pr-144		0.001	--	--
Nd-147		0.0009	--	--
Pm-145		0.0001	--	--
Cr-51		0.035	--	0.00006
Ma-56		0.032	--	--
Fe-55		0.032	--	0.00005
Fe-59		0.019	--	0.00003
Co-58		0.32	0.00003	0.00051
Co-60		0.039	--	0.00006
Np-239		0.014	--	0.00002
	Total	22	0.030	0.17 Ci/yr/unit
H-3				∿ 350 Ci/yr/unit

Table 3.5-7

ANTICIPATED ANNUAL RELEASE OF RADIOACTIVE MATERIAL IN GASEOUS EFFLUENT FROM INDIAN POINT UNIT NO. 1 (MODIFIED PROCESS)

Isotope	Ci/yr
Kr-85	180
Kr-87	1.7
Kr-88	5.6
Xe-133m	8.4
Xe-133	1000
Xe-135	2.0
Xe-138	1.2
Total Noble Gases	1200
Iodine-131	0.06*

*Includes radioactive half lives of 8 days or more, ground release.

Table 3.5-8

CALCULATED ANNUAL RELEASE OF RADIOACTIVE MATERIAL IN GASEOUS EFFLUENT FROM INDIAN POINT UNIT NO. 2
(PRESENT SYSTEM)

Isotope	Containment Purge (Ci/yr)	Gas Processing System (45-Day Holdup) (Ci/yr)	Steam Generator Blowdown (Ci/yr)	Total
Kr-85	13	790	2.1	810
Kr-87	0.044	--	2.9	3
Kr-88	0.31	--	9.4	10
Xe-131m	9.6	63	3.4	76
Xe-133	1000	390	680	2100
Xe-135	0.35	--	3.2	3.6
Xe-138	0.007	--	2.2	2.2
Total Noble Gases	1000	1200	700	3000
I-131	0.018	--	0.62	0.64
I-133	0.018	--	0.31	0.33

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Docket Nos. 50-3
50-247
50-286

Daniel R. Muller, Assistant Director for Environmental Projects, L
THRU: George W. Knighton, Chief, Environmental Projects Branch No. 1, L

INDIAN POINT UNIT NOS. 1, 2, AND 3 FINAL ENVIRONMENTAL STATEMENT FOR IP-3, DES FOR IP-1, AND APPEAL BOARD DECISION (ALAB-188) ON IP-2.

On March 27 through April 9, 1974, I visited ORNL to discuss the status of the responses to the comments on the DES for IP-3 obtained from Federal and State agencies, intervenors and the applicant. ORNL had completed about 90% of the responses to the comments dealing with biological, ~~chemical~~, and thermal impacts. The remaining comments dealt with comments on the geology and seismology of the site and the radwaste releases and radiological impacts. The DES for IP-1 will be issued after issuance of the FES for IP-3. The ORNL draft of the DES for IP-1 has been prepared incorporating by reference ehe environmental impacts discussed in the FES for IP-3.

On Aril 4, 1974, the Appeal Board issued a decision (ALAB-188) in response to the applicant's and intervenors' exceptions to the Licensing Board's Initial Decision. On April 9, 1974, a meeting was held at ORNL with OGC, EPB, and ORNL to discuss the results of the preliminary review of ALAB-188 and determine its impact on the staff's position taken on the IP-2 case, the impact on issuance of the FES for IP-3 and the DES for IP-1. Copies of ALAB decision had been received by ORNL and the EPM late the day before the meeting so that only a cursory review could be made by the ORNL team and EPM. Except for the EPB, and several ORNL management and certain team members present, the rest of the attendees had relatively little knowledge of the IP-2 record in relation to the issues of controversy as discussed in ALAB-188. OGC wanted to get acquainted with the technical issues of the IP case, to determine who would be the witnesses at ORNL to defend the FES for IP-3, and to plan and scope the strategy and schedule for the hearing for IP-3. The Appeal Board's assessment of the staff's position dealing with the mid-Atlantic fishery, the envtainment models, the applicant's ecological studies, and the schedule for the closed cycle cooling system has had a profound affectoon the issuance of tha FES for IP-3 at the present time. ORNL believed it could demonstrate that the Appeal Board is in error in review of the record. The major conclusion of the decision was to delay the terminatinn date for the operation of once-through cooling until May 1, 1979.

Details of the visit at ORNL and discussions with the ORNL team leader and team members from March 27 to April 8, 1974 and the April 9, 1974 meeting are described in Attachment 1. A list of attendees for the April 9, meeting is presented in Attachment 2.

/s/ Original signed by M. J. Oestmann

Mary Jane Oestmann, Project Manager
Environmental Projects Branch No. 1
Directomate of Licensing

Attachments:
As stated

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DATE ➤	6/26/74	6/ /74				

DETAILS OF DISCUSSIONS WITH INDIAN POINT TEAM MEMBERS AT ORNL AND MEETING ON APPEAL BOARD DECISION ON IP-2
MARCH 28 - APRIL 9, 1974

INDIAN POINT UNITS NOS. 1, 2 AND 3
DOCKET NOS. 50-3, 50-247, 50-286

DISCUSSION WITH INDIAN POINT TEAM MEMBERS AT ORNL AND MEETING ON APPEAL BOARD DECISION ON IP-2 MARCH 28 - APRIL 9, 1974

I. STATUS OF FES FOR INDIAN POINT UNIT NO. 3

On March 28, 1974, the EPM received from R. Rush, ORNL Team Leader, a rough draft copy of the ORNL responses to comments on the DES from the New York Department of Environmental Conservation, the New York Attorney General, the intervenors, HRFA and SOS, and the applicant. The applicant submitted over 300 comments. Comments from the other parties were also very extensive such that about a total of 500 comments were received. Comments from Federal agencies had been responded to during January and February. The major emphasis was to respond to comments dealing with biological, thermal, and chemical impacts, ecological studies, alternate cooling systems, and cost-benefit analysis.

On March 28-30, most the effort was spent reviewing and revising responses to comments from the New York State Department of Environmental Conservation and the Attorney General. On April 1 and 2, 1974, the responses to the Intervenors' comments were reviewed and revised. From April 2 through April 8, all effort was expended on responding to the applicant's 300 comments. However, ORNL did not respond to the comments pertaining to the question of bias in the letter dated December 24, 1973, of transmittal from the applicant that accompanied the comments. The applicant's arguments pertaining to the burden of proof and NEPA requirements in this letter were the same as those presented in the Appeal Board's questions of January 14, 1974, and discussed in the Appeal Board decision on Unit No. 2.

II. THIRD ENTRAINMENT MODEL

On April 8, 1974, the EPM was informed by the ecologist, W. Van Winkle, at ORNL, that ORNL had been working on a third entrainment model starting about a year ago. The work being done was by P. Goodyear and A. Ersalan, consultant to the ORNL impact group and Professor in mechanical engineering at the University of Tennessee. The third entrainment model is one which takes into account both hydraulics and biological behavior in a more sophisticated manner than is done in the staff's previous two models. It is apparently similar to the Lawler's October 30, 1972 transport model which discusses "f" factors and compensation. The staff's first entrainment model is presented in the FES for Unit No. 2 and the second entrainment model is presented in the testimony by Goodyear on the multiplant analysis, dated February 14, 1974 and described in Appendix B of the DES for IP-3. Both the first and second entrainment models included the hydraulic flow of the Hudson River. On April 8, 1974, the EPM was informed by W. Van Winkle that Van Winkle did not have a clear understanding of the first entrainment model by Goodyear presented in the FES. Van Winkle worked on the adult-fish model which determines the long-term effects on the population from plant operation over 40 years. Goodyear's entrainment model was based on the first year life of the entrainable eggs and larvae and the effects on the population of the young-of-the year juveniles. The entrainment impact from both the staff's models were an order of magnitude higher than the "best estimates" by the applicant. Van Winkle expressed the concern that the development of the third entrainment model should be continued even though Goodyear had left ORNL. The model description and results should be presented in the hearing for IP-3.

III. APPEAL BOARD DECISION (ALAB-188) AND ITS IMPACT ON THE IP-3 CASE

On April 9, 1974, OGC, EPB and ORNL met to discuss the issues of controversy in the IP-3 case, the impact of ALAB-188 decision on the FES for IP-3, and the hearing for IP-3. Except for W. Hoard, lawyer for Union Carbide, S. Siegel, D. Nelson, R. Rush, M. Siman-Tov, C. Carter from ORNL, and G. Knighton, EPB, and M. J. Oestmann, EPM, the rest of attendees had limited experience regarding the IP-2 record. The purpose of the meeting was to acquaint OGC with the technical areas of controversy presented in the IP-2 case and to discuss the impact of the Appeal Board's criticism of the staff's position taken on mid-Atlantic fishery, the entrainment models, the ecological studies, and the scheduling for the closed-cycle cooling system on completion of the FES for IP-3. Overall the concern was the effect of the Appeal Board decision on the staff conclusion requiring cooling towers. In order to have the time to assess the decision adequately, it was decided that a request for a 60-day extension to file a petition for reconsideration would be made. The petition was due by April 15, 1974.

The individual key issues were discussed regarding the staff's position on the mid-Atlantic fishery and the differences between the different models of each party in the proceeding. OGC was informed of the reasons on how the conclusions were reached in the FES for IP-2. The requirement for closed-cycle cooling by 1978 was recommended by ORNL after a meeting was held on August 25, 1972, between ORNL and AEC management, based upon the magnitude of severity of the entrainment and impingement impacts and their effect on the fish population in the Hudson River and the New York Bight, New Jersey and New England Coasts. The contribution of the Hudson River-spawned fish on the mid-Atlantic fishery was described in Chapter XII of the FES just a few days before the FES went to the printer and thus did not enter into the original conclusions in the Summary and Conclusions of the FES. Van Winkle explained how Goodyear interpreted the fishery statistics and drew his conclusion on the contribution of the Hudson River and Chesapeake Bay to the mid-Atlantic fishery. The Appeal Board also criticized the staff in reference to the regression analysis on relating the Hudson River landings to the New York and mid-Atlantic landings.

In regard to the applicant's ecological study reports, T. Row requested that a date should be set after which any future ecology reports could be ignored since the staff is being inundated by the applicant's ecology reports. Rush recommended that an OL should be issued only after the final report on ecology studies be completed by 1977.

A discussion followed in which each party's entrainment models were described. The applicant's transport model had "f" factors which were described in Lawler's October 30, 1972 testimony one month after the FES was issued. Lawler had presented his first model (uniformily mixed entrainment model) in his April 5, 1972 testimony. The subject of compensation was incorporated in the applicant's second model, but the staff believed that density-independent effects existed because fishing intensity and fishing laws and regulation controlled the fish population and, therefore, the applicant had no basis to incorporate compensation into the transport model. The applicant also had 3-hour runs in its transport model compared to the staff's 24-hour runs in the FES model. The second staff model had 6-hour runs in the FES model. It was concluded that in view of the Appeal Board's criticism of the staff's entrainment models, sections in Chapter V and Appendix B of the draft FES for IP-3 will need extensive revision. The third entrainment model work would need reexamination with the possibility of incorporating it in the FES for IP-3. The staff's position would be strengthened considerably by incorporating the third entrainment model.

Gallo reported that the parties stipulated that discovery would begin 30 days after the issuance of the FES. A prehearing conference would be held to finalize the areas of controversy for the hearing schedule. The applicant requested that the hearing begin September 4, 1974.

Siegel recommended that to carryout a thorough review of the Appeal Board decision and development of additional models, additional funds and manpower would be required. D. Nelson remarked about the limited manpower of W. Van Winkle. The AEC Division of Biology and Environmental Research presently supports the work being done by ORNL on entrainment and adult fish models. C. Coutant aided Goodyear in the IP-3 hearing. S. Christiansen could possibly help Van Winkle in the IP-3 hearing. ORNL was to investigate who could provide Van Winkle assistance in the reexamination of the entrainment model development. The schedule for the FES thus would be slipped.

The conclusions reached as to what further action should be taken in view of the Appeal Board decision include the following:

1. The ORNL team is to conduct a one-week review (4/10 to 4/17/74) of the Appeal Board decision to identify any errors and misinterpretation of the staff's position and to determine if sufficient basis exists for OGC to file a motion for reconsideration of the decision.

2. If there is adequate information as to errors made by the Appeal Board, then the ORNL team will continue to conduct a detailed critical review of the decision; to prepare a step-by-step rebuttal as appropriate; and to provide the appropriate evidence in the record for a legal brief to support the petition for reconsideration. ORNL would also estimate the schedule and funding needed for additional work to be done on the IP-2 case.

3. OGC would file by April 15, 1974, a request for a 60 day extension to determine whether any basis exists to file a petition for reconsideration.

4. The issuance of the FES for IP-3 and DES for IP-1 would have to be delayed pending resolution of technical issues in the Appeal Board decision. Furthermore, it appeared

that an outside unbiased review of the ORNL entrainment studies and position taken on the significant contribution of the Hudson River to the mid-Atlantic fishery should be carried out to obtain an independent assessment of the AEC position.

ATTACHMENT 2

ATTENDEES AT THE APRIL 9, 1974 MEETING AT ORNL

ORNL	AEC
W. Hoard	J. Gallo
S. Siegel	F. Gray
W. Fulkerson	S. Treby
T. Row	G. W. Knighton
R. Rush	M. J. Oestmann
B. Dinger	
M. Siman-Tov	
D. Nelson	
C. M. Carter	