Indian Point Leaks: Jurisdictional Issues

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Key Federal Regulations

- **Environmental Protection Agency (EPA) regulations governing radioactivity levels in drinking water (Title 40 of the Code of Federal Regulations)**
- **Nuclear Regulatory Commission (NRC) regulations governing releases of radioactive liquids from nuclear power plants into water (Title 10 of the Code of Federal Regulations)**

EPA's Regulations

40 CFR

§ 141.66 Maximum contaminant levels for radionuclides.

TABLE A—AVERAGE ANNUAL CONCENTRATIONS ASSUMED TO PRODUCE: A TOTAL BODY OR ORGAN DOSE OF 4 MREM/YR

1. Radionuclide	Critical organ	pCi per liter
2. Tritium	Total body	20,000
3. Strontium-90	Bone Marrow	8

(equals 0.00002 μCi/ml)

NRC's Regulations

Code of Federal Regulations, Title 10, Part 50, Appendix A:

***Criterion 60--Control of releases of radioactive materials to the environment*. The nuclear power unit design shall include means to control suitably the release of radioactive materials in gaseous and liquid effluents and to handle radioactive solid wastes produced during normal reactor operation, including anticipated operational occurrences. Sufficient holdup capacity shall be provided for retention of gaseous and liquid effluents containing radioactive materials, particularly where unfavorable site environmental conditions can be expected to impose unusual operational limitations upon the release of such effluents to the environment.**

***Criterion 64--Monitoring radioactivity releases*. Means shall be provided for monitoring the reactor containment atmosphere, spaces containing components for recirculation of loss-of-coolant accident fluids, effluent discharge paths, and the plant environs for radioactivity that may be released from normal operations, including anticipated operational occurrences, and from postulated accidents.**

NRC's Regulations

§ 50.36a Technical specifications on effluents from nuclear power reactors.

(a) In order to keep releases of radioactive materials to unrestricted areas during normal conditions, including expected occurrences, as low as is reasonably achievable, each licensee of a nuclear power reactor will include technical specifications that, in addition to requiring compliance with applicable provisions of § 20.1301 of this chapter, require that:

(1) Operating procedures developed pursuant to § 50.34a(c) for the control of effluents be established and followed and that the radioactive waste system, pursuant to § 50.34a, be maintained and used. The licensee shall retain the operating procedures in effect as a record until the Commission terminates the license and shall retain each superseded revision of the procedures for 3 years from the date it was superseded.

(2) Each licensee shall submit a report to the Commission annually that specifies the quantity of each of the principal radionuclides released to unrestricted areas in liquid and in gaseous effluents during the previous 12 months, including any other information as may be required by the Commission to estimate maximum potential annual radiation doses to the public resulting from effluent releases.

NRC's Regulations

§ 20.1301 Dose limits for individual members of the public.

(a) Each licensee shall conduct operations so that —

(1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any administration the individual has received, from exposure to individuals administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003

NRC's Regulations

§ 20.1302 Compliance with dose limits for individual members of the public.

(a) The licensee shall make or cause to be made, as appropriate, surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in § 20.1301.

NRC's Regulations

Appendix B to Part 20--Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage

The columns in Table 2 of this appendix captioned "Effluents," "Air," and "Water," are applicable to the assessment and control of dose to the public, particularly in the implementation of the provisions of § 20.1302. The concentration values given in Columns 1 and 2 of Table 2 are equivalent to the radionuclide concentrations which, if inhaled or ingested continuously over the course of a year, would produce a total effective dose equivalent of 0.05 rem (50 millirem or 0.5 millisieverts).

NRC's Regulations

Hydrogen-3

Atomic No.	Radionuclide	Class	Table 1 Occupational Values			Table 2 Effluent Concentrations		Table 3 Releases to Sewers
			Col. 1	Col. 2	Col. 3	Col. 1	Col. 2	
			Oral Ingestion ALI (µCi)	Inhalation		Air (µCi/ml)	Water (µCi/ml)	Monthly Average Concentration (µCi/ml)
				ALI (µCi)	DAC (µCi/ml)			
1	Hydrogen-3	Water, DAC includes skin absorption	8E+4	8E+4	2E-5	1E-7	1E-3	1E-2
		Gas (HT or T_2) Submersion[1]: Use above values as HT and T_2 oxidize in air and in the body to HTO						

(equals 1,000,00 pCi/liter)

From Table 2 in Appendix B to 10 CFR 20

NRC's Regulations

The point is that to comply with NRC's regulations on doses to the public, one must monitor all releases of radioactive material to the air and water.

Any unmonitored release, no matter its size, violates the regulations.

NRC's Regulations

You can't avoid a ticket for exceeding this,

by showing the officer your car doesn't have one of these.

New York State Regulation

- Department of Environmental Conservation (DEC)
  - Regulates discharges of non-radioactive liquid effluent from Indian Point under the Clean Water Act, pursuant to NY's State Pollution Discharge Elimination System (SPDES)
  - Authority to enforce regulations protecting groundwater quality under the Environmental Conservation Law (ECL)

New York State Regulation

- NYS Environmental Conservation Law
  - 6 NYCRR 701.1- “General Conditions Applying to all Water Classifications” states that
    - “The discharge of sewage, industrial waste or other wastes shall not cause impairment of the best usages of the receiving water as specified by the water classifications at the location of discharge and at other locations that may be affected by such discharge.”
  - 6 NYCRR 701.15- “Class GA Fresh Groundwaters” states that
    - “The best usage of Class GA waters is as a source of potable water supply. Class GA waters are fresh groundwaters.”

New York State Regulation

- Levels of Cesium-137, Strontium-90 and Tritium in the groundwater under Indian Point far exceed NYS and EPA drinking water limits for these toxic substances.
- It does not matter whether anyone drinks the water at IP- the law is intended to protect all groundwater in the state equally, so there is never a chance of contamination reaching drinking water aquifers.
- Indian Point is clearly in violation of the state's groundwater quality standards for these toxic substances- has the DEC taken enforcement action regarding these violations? If not, why not?

New York State Regulation

- NY State Department of Health (DOH)
  - Conducts periodic environmental sampling for offsite effects of radionuclides near state nuclear sites- Indian Point, Fitzpatrick, Brookhaven, etc.
  - Last Environmental Radiation Report published in 1994
    - Next report due to be published in 2007?

New York State Regulation

- 1994 DOH Radiation Sampling at Indian Point
  - Only sampled air, Hudson river water and fish
  - Fish samples not analyzed for Sr-90
    - How many fish sampled? What species?
    - Comparison- Brookhaven fish samples showed Sr-90 levels in same range as recent Indian Point samples
  - No sediment or vegetation samples collected

NRC Environmental Monitoring Program

- Indian Point required to file yearly reports summarizing results of offsite sampling for radiation
- NRC stopped requiring analysis for Sr-90 in early 1980s, even though routine liquid releases of Sr-90 continued to the present.
- Entergy began analyzing fish for Sr-90 in early 2006- edible portions only

Conclusions

- **EPA and NRC regulations on radioactivity levels in water are intended to protect the public from harm.**
- **In order for the regulations to achieve that intent, it is essential that monitoring, as required by regulations, encompasses ALL releases of radioactively contaminated liquid into the ground.**
- **New York state agencies (DEC & DOH) must improve their existing oversight and undertake new studies on the long-term environmental effects of all liquid radiological releases on the Hudson river ecosystem.**