Effluent Releases

Effluent (in Latin it stands for "to flow out"): Refers to a radioactive material released into the environment as a gaseous or liquid discharge.

Where Are Effluent Releases Happening?

Operating and decommissioning facilities, whether nuclear or not, may release air and/or water emissions from their activities. The air and water emissions could include entrained radioactive material, such as radioactive gases or fine particulates in the case of air emissions. Water effluents could include radioactive material that is either dissolved or suspended within the water.

Effluents are not unique to nuclear power plants, but are also released by other NRC licensed facilities, including research and test reactors, fuel fabrication facilities, mining facilities, universities, hospitals, and cancer treatment facilities.

Effluent release points in a facility could be concentrated to a single release point, such as an outflow pipe to a water body or a central stack. Several facility types can have a range of air emission points such as from the top of several buildings or the individual well heads in a wellfield.

Types of Effluents

A very small fraction of licensed radioactive material is typically emitted into the environment each year, as a result of normal operations.

The radioactive effluents released from nuclear facilities including nuclear power plants and fuel cycle facilities are separated into two sections:

- Airborne releases (released into the atmosphere)
- Liquid discharges (released into surface waters)

All environmental discharges (liquid and airborne) from these facilities are subject to regulations issued by the U.S. Environmental Protection Agency (EPA), the U.S. Nuclear Regulatory Commission (NRC), and state and local environmental and conservation laws.

Licensees will develop and utilize environmental monitoring programs consistent with the site conditions to ensure that releases remain below the appropriate dose limits. For example, Reg. Guide 1.109 is the guidance document which provides the methodology to calculate annual dose to the public from effluent releases from nuclear power plants.

Effluent monitors are used at facilities with discrete release points. The Radiological Effluent Technical Specifications (RETS) program at a nuclear power plant will employ measurement techniques and will sample media appropriate to the type of radiation released as well as the physical and chemical forms of the contaminants. Because the highest concentrations are expected at the release points, effluent measurements are relatively simple.

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