

## Chapter NR 290

## STEAM ELECTRIC POWER GENERATING

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**NR 290.01 Purpose.** The purpose of this chapter is to establish effluent limitations, standards of performance, and pretreatment standards for discharges from the steam electric power generating category of point sources and subcategories thereof.

**Note:** The authority for promulgation of this chapter is set forth in ch. NR 205.

**History:** Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.02 Applicability.** The effluent limitations, standards of performance, pretreatment standards, and other provisions in this chapter are applicable to pollutants or pollutant properties in discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil type fuel or nuclear fuel in conjunction with a thermal cycle employing the steam-water system as the thermodynamic medium. Operations are classified in the following subcategories;

- (1) A generating unit,
- (2) A small unit,
- (3) An old unit, and
- (4) Material storage or construction activity resulting in runoff.

**History:** Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.03 Definitions.** The following definitions are applicable to terms used in this chapter. Definitions of other terms and meanings of abbreviations are set forth in ch. NR 205.

- (1) "Ash transport water" means water used in the hydraulic transport of either fly ash or bottom ash.
- (2) "Blowdown" means the minimum discharge of recirculating water for the purpose of discharging materials contained in the process the further buildup of which would cause concentrations or amounts exceeding limits established by best engineering practice.
- (3) "Construction runoff" means the rainfall runoff from any construction activity and any earth surface disturbed by such activity from the inception of the construction until construction is complete and any dis-

turbed earth is returned to a vegetative or other cover commensurate with the intended land use.

(4) "Cooling lake" means any manmade water impoundment which impedes the flow of a navigable stream and which is used to remove waste heat from heated condenser water prior to recirculating the water to the main condenser.

(5) "Cooling pond" means any manmade water impoundment which does not impede the flow of a navigable stream and which is used to remove waste heat from heated condenser water prior to returning the recirculated cooling water to the main condenser.

(6) "Low volume waste sources" means, taken collectively as if from one source, wastewater from all sources except those for which specific limitations are otherwise established in ss. NR 290.10-.12. Low volume waste sources include but are not limited to waste waters from wet scrubber air pollution control systems, ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, floor drainage, cooling tower basin cleaning wastes and blowdown from recirculating house service water systems. Sanitary and air conditioning wastes are specifically not included in this definition.

(7) "Free available chlorine (FAC)" means the value obtained using the amperometric titration method for free available chlorine described in "Standard Methods for the Examination of Water and Wastewater", page 112 (13th edition, 1971). Copies of the above document are available for inspection at the office of the department of natural resources, the secretary of state's office, and the office of the revisor of statutes, and may be obtained for personal use from the American Public Health Association, Inc. 1790 Broadway, New York, New York, 10019.

(8) "Generating unit" means any generating unit subject to the provisions of this chapter except those defined as small or old units.

(9) "Material storage runoff" means the rainfall runoff from or through any coal, ash or other material storage pile.

(10) "Metal cleaning wastes" means any cleaning compounds, rinse waters, or any other waterborne residues derived from cleaning any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning.

(11) "Old unit" means any generating unit, subject to the provisions of this chapter, of 500 megawatts or greater rated net generating capacity which was first placed in service on or before January 1, 1970 and any generating unit of less than 500 megawatts rated net generating capacity which was first placed in service on or before January 1, 1974.

(12) "Once through cooling water" means water passed through the main cooling condensers in one or 2 passes for the purpose of removing waste heat from the generating unit.

(13) "Recirculated cooling water" means water which is passed through the main cooling condensers for the purpose of removing waste heat from the generating unit, passed through a cooling device for the purpose of removing such heat from the water and then passed again, except for blowdown, through the main cooling condensers.

(14) "Regional reliability council" means either the Mid-America Interpool Network (MAIN), MAIN Coordination Center, 1 N 301 Swift Road, Lombard, Illinois 60148, or the Mid-Continent Area Reliability Coordination Agreement (MARCA), MAPP Coordination Center, 88 South 6th Street, Minneapolis, Minnesota 55402.

(15) "Small unit" means any generating unit subject to the provisions of this chapter, except a unit defined as old, of less than 25 megawatts rated net generating capacity or any unit which is part of an electric utilities system with a total net generating capacity of less than 150 megawatts.

(16) "Sufficient land" means 100 sq m (1100 sq ft) or more per megawatt of nameplate generating capacity.

(17) "10 year, 24 hour rainfall event" means a rainfall event with a probable recurrence interval of once in 10 years as defined in s. NR 205.05.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.04 Compliance with effluent limitations and standards.** Discharge of pollutants from facilities subject to the provisions of this chapter may not exceed, as appropriate:

(1) By July 1, 1977 effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available;

(2) By July 1, 1983 effluent limitations representing the degree of effluent reduction attainable by the application of the best available technology economically achievable;

(3) Pretreatment standards for discharges to publicly owned treatment works;

(4) Standards of performance for new sources.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76; r. and recr. Register, August, 1983, No. 332, eff. 9-1-83.

**NR 290.05 Modification of effluent limitations.** (1) Effluent limitations representing the degree of effluent reduction attainable by the application of the best practicable control technology currently available may be modified in accordance with this section.

(2) An individual discharger or other interested person may submit evidence to the department that factors relating to the equipment or facilities involved, the process applied, or other such factors related to such discharger are fundamentally different from the factors considered in the establishment of the effluent limitations. On the basis of such evidence or other available information the department will make a written determination that such factors are or are not fundamentally different for that facility compared to those specified in the Steam Electric Power Generating Development Document, EPA 440/1-74-029-a. If such fundamentally different factors are found to exist, the department shall establish for the discharge effluent limitations in the WPDES permit either more or less stringent than the limitations in this chapter, to the extent dictated by such fundamentally different factors. Such limitations must be

approved by EPA which may approve, disapprove, or specify other limitations.

(3) Copies of this Development Document, "Steam Electric Power Generating," EPA 440/1-74-029-a, published October, 1974, are available for inspection at the office of the department of natural resources, the secretary of state's office, and the office of the revisor of statutes, and may be obtained for personal use from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20460.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.06 Application of effluent limitations and standards.** (1) The effluent limitations and standards set forth in this chapter shall be used in accordance with this section to establish the quantity or quality of pollutants or pollutant properties which may be discharged by a point source subject to the provisions of this chapter, except as;

(a) They may be modified in accordance with s. NR 290.05.

(b) They may be superseded by more stringent limitations and standards necessary to achieve water quality standards or meet other legal requirements, or

(c) They may be supplemented or superseded by standards or prohibitions for toxic pollutants or by additional limitations for other pollutants required to achieve water quality.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.10 Effluent limitations, best practicable treatment.** The following effluent limitations for all or specific wastewater flows establish, except as provided in s. NR 290.05, the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application of the best practicable control technology currently available.

(1) The pH of all discharges, except once through cooling water and overflow in accordance with sub. (6), shall be within the range of 6.0 to 9.0.

(2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(3) The quantity of pollutants in each of the flows identified in Table 1 shall not exceed for any subcategory the quantity determined by multiplying the flow by the concentration of each pollutant listed in that table.

Table 1  
BPT Effluent Limitations in mg/l

Flow	TSS		Oil & Grease		Iron <sup>1</sup>		Copper <sup>1</sup>		FAC <sup>2</sup>	
	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.
Low volume waste	30	100	15	20						
Ash transport water	30	100	15	20						
Boiler blowdown	30	100	15	20	1.0	1.0	1.0	1.0		
Metal cleaning wastes	30	100	15	20	1.0	1.0	1.0	1.0		
Once through cooling water								0.2		0.5
Cooling tower blowdown									0.2	0.5
Material storage and construction runoff			50							

Note: (1) as total iron or total copper  
(2) "FAC" means free available chlorine as defined in s. NR 290.03 (7).

(4) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than 2 hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the department that the units in a particular location cannot operate at or below this level of chlorination.

(5) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property limited in subs. (1) through (4) of this section attributable to each controlled waste source except material storage and construction runoff shall not exceed the specified limitation for that waste source.

(6) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of material storage and construction runoff which is associated with a 10 year 24 hour rainfall event shall not be subject to the limitation of sub. (3).

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.11 Effluent limitations, best available treatment.** The following effluent limitations for all or specific wastewater flows establish the quantity or quality of pollutants or pollutant properties which may be discharged by a facility subject to the provisions of this chapter after application of the best available technology economically achievable.

(1) The pH of all discharges, except once through cooling water and overflow in accordance with sub. (6), shall be within the range of 6.0 to 9.0.

(2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(3) The quantity of pollutants in each of the flows identified in Table 2 shall not exceed for any subcategory the quantity determined by multiplying the flow by the concentration of each pollutant listed in that table, except that for bottom ash transport water the quantity so determined shall be divided by 12.5.

Table 2

Flow	BAT Effluent Limitations in mg/l									
	TSS		Oil & Grease		Iron (1)		Copper(1)		FAC(2)	
	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.
Low volume waste	30	100	15	20						
Bottom ash transport water	30	100	15	20						
Boiler blowdown	30	100	15	20	1.0	1.0	1.0	1.0		
Metal cleaning wastes	30	100	15	20	1.0	1.0	1.0	1.0		
Fly ash transport water	30	100	15	20						
Once through cooling water									0.2	0.5
Cooling tower blowdown (3)									0.2	0.5
Material storage and construction runoff		50								

Note: (1) as total iron or total copper

(2) "FAC" means free available chlorine as defined in s. NR 290.03(7).

(3) discharge of cooling tower blowdown shall also be limited to average and maximum concentrations of 1.0 mg/l of total zinc, 0.2 mg/l of total chromium, and 5.0 mg/l of total phosphorus, and as necessary on a case by case basis with respect to any other corrosion inhibiting material.

(4) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than 2 hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the department that the units in a particular location cannot operate at or below this level of chlorination.

(5) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in subs. (1) through (4) of this section attributable to each controlled waste source except material storage and construction runoff shall not exceed the specified limitation for that waste source.

(6) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of material storage and construction runoff which is associated with a 10 year 24 hour rainfall event shall not be subject to the limitation of s. NR 290.10 (3).

(7) For generating units which are neither small units nor old units, there shall be no discharge of heat from the main condensers except that:

(a) Heat may be discharged in blowdown from recirculated cooling water systems provided the temperature at which the blowdown is discharged does not exceed at any time the lowest temperature of recirculating cooling water prior to the addition of the make-up water.

(b) Heat may be discharged in blowdown from recirculated cooling water systems which have been designed to discharge blowdown water at a temperature above the lowest temperature of recirculated cooling water prior to the addition of make-up water providing such recirculating cooling systems were placed in operation or were under construction prior to November 7, 1974.

(c) Heat may be discharged in overflow from a cooling lake or pond where the owner or operator of a unit otherwise subject to this limitation can demonstrate that a cooling pond or lake in service or under construction on November 7, 1974, is used to cool recirculated cooling water before it is returned to the main condensers.

(d) Heat may be discharged where the owner or operator of a unit otherwise subject to this limitation can demonstrate that sufficient land for the construction and operation of mechanical draft evaporative cooling towers was not available (after consideration of alternate land use assignments) on the premises or on adjoining property under the ownership or control of the owner or operator as of March 4, 1974, and that no alternate recirculating cooling system is practicable.

(e) Heat may be discharged where the owner or operator of a unit otherwise subject to this limitation can demonstrate that the total dissolved solids concentration in blowdown exceeds 30,000 mg/l and land not owned or controlled by the owner or operator as of March 4, 1974, is located within 150 meters (500 feet) in the prevailing downwind direction of every practicable location for mechanical draft cooling towers and that no alternate recirculating cooling system is practicable.

(f) Heat may be discharged where the owner or operator of a unit otherwise subject to this limitation can demonstrate to the department that the plume which must necessarily emit from a cooling tower would cause a substantial hazard to commercial aviation and that no alternate recirculated cooling water system is practicable. In making such demonstration to the department, the owner or operator of such unit must include a finding by the federal aviation administration that the visible plume emitted from a well-operated cooling tower would in fact cause a substantial hazard to commercial aviation in the vicinity of a major commercial airport.

(8) The limitation of sub. (7) of this section shall become effective on July 1, 1981, except as provided in sub. (9) below.

(9) In the event that a regional reliability council, or when no functioning regional reliability council exists, a major utility or consortium of utilities, can demonstrate to the department that the system reliability would be seriously impacted by complying with the effective date set forth in sub. (8) above, the department may accept an alternative proposed schedule of compliance on the part of all the utilities concerned providing, however, that such schedule of compliance will require that units representing not less than 50% of the affected generating capacity shall meet the compliance date, that units representing not less than an additional 30% of the generating capacity shall comply not later than July 1, 1982, and that the balance of units shall comply not later than July 1, 1983.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

**NR 290.12 Standards of performance.** The following effluent limitations for all or specific subcategories establish the quantity or quality of pollutants or pollutant properties which may be discharged by a facility which is a new source subject to the provisions of this chapter.

(1) The pH of all discharges, except once through cooling water and overflow in accordance with sub. (6) shall be within the range of 6.0 to 9.0

(2) There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

(3) The quantity of pollutants in each of the flows identified in Table 3 shall not exceed for any subcategory the quantity determined by multi-

plying the flow by the concentration of each pollutant listed in that table, except that for bottom ash transport water the quantity so determined shall be divided by 20.

Table 3

Flow	Effluent Limitations in mg/l									
	TSS		Oil & Grease		Iron(1)		Copper(1)		FAC(2)	
	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.	Ave.	Max.
Low volume waste	30	100	15	20						
Bottom ash transport water	30	100	15	20						
Boiler blowdown	30	100	15	20	1.0	1.0	1.0	1.0		
Metal cleaning wastes	30	100	15	20	1.0	1.0	1.0	1.0		
Fly ash transport water	zero	zero	zero	zero						
Once through cooling water									0.2	0.5
Cooling tower blowdown (3)									0.2	0.5
Material storage and construction runoff		50								

Note: (1) as total iron or total copper

(2) "FAC" means free available chlorine as defined in s. NR 290.03(7).

(3) discharges of cooling tower blowdown shall contain no detectable amounts of materials added to inhibit corrosion.

(4) Neither free available chlorine nor total residual chlorine may be discharged from any unit for more than 2 hours in any one day and not more than one unit in any plant may discharge free available or total residual chlorine at any one time unless the utility can demonstrate to the department that the units in a particular location cannot operate at or below this level of chlorination.

(5) In the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in subs. (1) through(4) of this section attributable to each controlled waste source except material storage and construction runoff shall not exceed the specified limitation for that waste source.

(6) Any untreated overflow from facilities designed, constructed, and operated to treat the volume of material storage and construction runoff which is associated with a 10 year 24 hour rainfall event shall not be subject to the limitation of s. NR 290.10 (3).

(7) There shall be no discharge of heat from the main condensers except:

(a) Heat may be discharged in blowdown from recirculated cooling water systems provided the temperature at which the blowdown is discharged does not exceed at any time the lowest temperature of recirculated cooling water prior to the addition of the make-up water.

(b) Heat may be discharged in blowdown from cooling ponds provided the temperature at which the blowdown is discharged does not exceed at any time the lowest temperature of recirculated cooling water prior to the addition of the make-up water.

History: Cr. Register, June, 1976, No. 246, eff. 7-1-76.

Register, August, 1983, No. 332  
Environmental Protection



**NR 290.13 Pretreatment standards.** The pretreatment standards for discharges to publicly owned treatment works from sources subject to the provisions of this chapter shall be as set forth in ch. NR 211.

**History:** Cr. Register, June, 1976, No. 246, eff. 7-1-76; r. and recr. Register, August, 1983, No. 332, eff. 9-1-83.