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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 122, 123, 124, and 125

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RIN 2040–AC34

National Pollutant Discharge Elimination System: Regulations Addressing Cooling Water Intake Structures for New Facilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: Today's final rule implements section 316(b) of the Clean Water Act (CWA) for new facilities that use water withdrawn from rivers, streams, lakes, reservoirs, estuaries, oceans or other waters of the United States (U.S.) for cooling purposes. The final rule establishes national technology-based performance requirements applicable to the location, design, construction, and capacity of cooling water intake structures at new facilities. The national requirements establish the best technology available, based on a two-track approach, for minimizing adverse environmental impact associated with the use of these structures.

Based on size, Track I establishes national intake capacity and velocity requirements as well as location- and capacity-based requirements to reduce intake flow below certain proportions of certain waterbodies (referred to as "proportional-flow requirements"). It also requires the permit applicant to select and implement design and construction technologies under certain conditions to minimize impingement mortality and entrainment. Track II allows permit applicants to conduct site-specific studies to demonstrate to the Director that alternatives to the Track I requirements will reduce impingement mortality and entrainment for all life stages of fish and shellfish to a level of reduction comparable to the level the facility would achieve at the cooling water intake structure if it met the Track I requirements.

EPA expects that this final regulation will reduce impingement and entrainment at new facilities. Today's final rule establishes requirements that will help preserve aquatic organisms and the ecosystems they inhabit in waters used by cooling water intake structures at new facilities. EPA has considered the potential benefits of the rule; these include a decrease in expected mortality or injury to aquatic organisms that would otherwise be subject to entrainment into cooling water systems or impingement against screens or other devices at the entrance of cooling water intake structures. Benefits may also accrue at population, community, or ecosystem levels of ecological structures. The preamble discusses these benefits to the extent possible in qualitative terms.

DATES: This regulation shall become effective January 17, 2002. For judicial review purposes, this final rule is promulgated as of 1:00 p.m. Eastern Standard Time (EST) on January 2, 2002, as provided in 40 CFR 23.2.

ADDRESSES: The public record for this rule is established under docket number W–00–03. Copies of comments received, EPA responses, and all other supporting documents (except for information claimed as Confidential Business Information (CBI)) are available for review in the EPA Water Docket, East Tower Basement, Room EB–57, 401 M Street, SW., Washington, DC 20460. The record is available for inspection from 9:00 a.m. to 4:00 p.m. Monday through Friday, excluding legal holidays. For access to the docket materials, please call (202) 260–3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: For additional technical information contact Deborah G. Nagle at (202) 260–2656. For additional biological information contact Debbi Hart at (202) 260–0905. For additional economic information contact Ghulam Ali at (202) 260–9886. The e-mail address for the above contacts is *rule.316b@epa.gov.*

SUPPLEMENTARY INFORMATION:

What Entities Are Regulated by This Action?

This final rule applies to new greenfield (defined by example in section I. of this preamble) and stand alone facilities that use cooling water intake structures to withdraw water from waters of the U.S. and that have or require a National Pollutant Discharge Elimination System (NPDES) permit issued under section 402 of the CWA. New facilities subject to this regulation include those that have a design intake flow of greater than two (2) million gallons per day (MGD) and that use at least twenty-five (25) percent of water withdrawn for cooling purposes. Generally, facilities that meet these criteria fall into two major groups: new steam electric generating facilities and new manufacturing facilities. If a new facility meets these conditions, it is subject to today's final regulations. If a new facility has or requires an NPDES permit but does not meet the two MGD intake flow threshold or uses less than 25 percent of its water for cooling water purposes, the permit authority will implement section 316(b) on a case-by-case basis, using best professional judgment. This final rule defines the term "cooling water intake structure" to mean the total physical structure and any associated constructed waterways used to withdraw water from a water of the U.S. The cooling water intake structure extends from the point at which water is withdrawn from the surface water source up to and including the intake pumps. Today's rule does not apply to existing facilities including major modifications to existing facilities that would be "new sources" in 40 CFR 122.29 as that term is used in the effluent guidelines and standards program. Although EPA has not finished examining the costs of technology options at existing facilities, the Agency anticipates that existing facilities would have less flexibility in designing and locating their cooling water intake structures than new facilities and that existing facilities might incur higher compliance costs than new facilities. For example, existing facilities might need to upgrade or modify existing intake structures and cooling water systems to meet requirements of the type contained in today's rule, which might impose greater costs than use of the same technologies at a new facility. Retrofitting technologies at an existing facility might also require shutdown periods during which the facility would lose both production and revenues, and certain retrofits could decrease the thermal efficiency of an electric generating facility. Site limitations, such as lack of undeveloped space, might make certain technologies infeasible at existing facilities. Accordingly, EPA does not intend that today's rule or preamble serve as guidance for developing section 316(b) requirements for existing facilities. Permit writers should continue to apply best professional judgment in making case-by-case section 316(b) determinations for existing facilities, based on existing guidance and other legal authorities. EPA will address existing facilities fully in Phase II and Phase III rulemakings.

The following table lists the types of entities that EPA believes are potentially subject to this final rule. This table is not intended to be exhaustive; rather, it provides a guide for readers regarding entities likely to be regulated by this action. Other types of entities not listed in the table could also be regulated. To determine whether your facility is regulated by this action, you should carefully examine the applicability criteria at § 125.81 of the rule. If you

construction technology(ies) it selects, nor does EPA require the applicant to conduct biological monitoring prior to submitting its application. Rather, to avoid permitting delays Track I only requires the applicant to gather and present historical information and/or literature to support its decision on which design and construction technology(ies) to implement at the new facility. *See* § 125.86(b)(4).

Because an applicant does not need the Director's approval of its design and construction technology(ies) prior to the first permit, EPA has included a provision that requires the Director to determine, at each permit reissuance, whether design and construction technologies at the facility are minimizing impingement mortality and/or entrainment, *See* § 125.89(a)(2). This provision is intended to ensure that the applicant selects and installs appropriate technology(ies).

The framework of these provisions balances a number of factors. One is EPA's interest in ensuring that applicants seeking their first permit under Track I can quickly obtain one without delay and, if they wish, without engaging in a dialogue with the Director about whether additional design and construction technologies are needed at their site, or which technologies will reasonably reduce impingement mortality and entrainment at the location. In this case, an applicant may wish to install some of the more highly protective additional design and construction technologies, to minimize any opportunity for disagreement with the Director at permit reissuance about whether the applicant chose technologies that "minimize" impingement mortality and entrainment at their location.

Alternatively, an applicant under § 125.84(b) who is willing to take the time to engage in a dialogue with the Director prior to the first permit under Track I may be able to obtain the Director's concurrence on a finding that the proposed intake will not be located in an area where fish or shellfish resources need additional protection. *See* § 125.84(b)(4) and (5) for a list of such areas. In this case, the applicant may not need to install any additional design and construction technologies. In the event that the location of the intake structure is such that additional technologies are required, an applicant who is willing to take the time to consult with the Director prior to the first permit under Track I may be able to obtain the Director's concurrence that technologies that are less costly than the most highly-protective ones available are sufficient for its location. (EPA again notes that "minimize" is defined as a reduction "to the smallest amount, extent or degree reasonably possible.")

EPA believes the above framework reasonably balances its interest in minimizing permit delays with its interest in ensuring that applicants willing to take more time and engage in a dialogue with the Director may have an opportunity to reduce their costs. As a general matter, EPA strongly encourages permit applicants to consult with the Director prior to selecting and installing design and construction technology(ies). Today's rule, however, requires no such consultation, and, as discussed elsewhere in this preamble, EPA's costing analysis conservatively assumes that permittees will install additional design and construction technologies at all locations.

EPA recognizes that the condition of biological resources at a location may change over time. The requirement for the Director to review the applicant's design and construction technologies at permit reissuance provides an opportunity for any appropriate changes in the design and construction technologies used at the location. *See* § 125.89(a)(2).

c. Location

Although EPA recognizes that the location of a cooling water intake structure can be a factor that affects the environmental impact caused by the intake structure, today's final rule, apart from the proportional flow requirements, does not include specific national requirements for new facilities based on location of the cooling water intake structure. In EPA's view, the optimal design requirement for location is to place the inlet of the cooling water intake structure in an area of the source waterbody where impingement and entrainment of organisms are minimized by locating intakes away from areas with the potential for high productivity (taking into account the location of the shoreline, the depth of the waterbody, and the presence and quantity of aquatic organisms or sensitive habitat). EPA received significant and convincing comments arguing against the specific proposed requirements and feasibility for locations based on waterbody type and location within the waterbody. Among other things, commenters argued that EPA's proposed requirements would be difficult to implement and relied on generalizations about types of waterbodies that were too simplistic. See section VI.C for further discussion of comments and EPA's responses regarding location. This topic is discussed further in Chapter 5 of the *Technical Development Document.*

Although today's rule does not specifically establish location requirements, several components of the two-track approach inherently consider location as a factor. Under Track I, location is a consideration when the applicant selects and implements the design and construction technologies for minimizing impingement and entrainment and maximizing impingement survival. In addition, EPA estimated that in order to meet the proportional flow requirements in Track I and Track II, facilities may need to site in locations that can support their water withdrawals or find other alternatives, such as, obtaining water from ground water, grey water, or a public water supply system. Under Track II, the new facility may choose location as a key component for minimizing impingement and entrainment. Under Track II, an applicant has the opportunity to conduct site-specific studies to demonstrate that alternative technologies or configurations, including the relocation of an intake to areas of less sensitivity, will reduce impingement mortality and entrainment for all life stages of fish and shellfish to a level of reduction comparable to the level that would be achieved were the applicant to implement the technology-based performance requirements in Track I.

In addition, this new facility rule also regulates location as a performance characteristic of new facilities to minimize entrainment and other adverse environmental impacts that are likely to occur as a result of the withdrawal of makeup water even where a facility uses recirculating systems. Historically, some previous CWA section 316(b) studies conducted for permits proceedings have considered potential impacts from facilities whose cooling water intake flow is large in proportion to the source water flow or tidal volume.[39] [40] [41] Under this rule, §§ 125.84(b)(3), 125.84(c)(2), and 125.84(d)(2), EPA establishes proportional flow requirements for new facility cooling water intake structures located in freshwater rivers and streams, lakes and reservoirs, and estuaries and

[39] Lewis, Randall B. and Greg Seegert. Entrainment and Impingement Studies at two Power Plants on the Wabash River in Indiana. Power Plants & Aquatic Resources: Issues and Assessment. *Environmental Science & Policy.* Volume 3, Supplement 1. September 2000.

[40] Public Service Indiana. 316(b) Demonstration for the Cayuga and Wabash River Generating Stations. Prepared by Dames and Moore, Cincinnati, Ohio. August 30, 1997.

[41] Public Service Company of Indiana. A 316(b) Study and Impact Assessment for the Cayuga Generating Station. Prepared by EA Science and Technology, Northbrook, IL. April 1988.

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tidal rivers, requiring that the total design intake flow from all cooling water intake structures at a facility withdrawing:

- From a freshwater river or stream must be no greater than five (5) percent of the source waterbody mean annual flow;
- From a lake or reservoir must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies);
- From estuaries or tidal rivers must be no greater than one (1) percent of the volume of the water column in the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level.

EPA finds these proportional flow limitations to represent limitations on capacity and location that are technically available and economically practicable for the industry as a whole. EPA examined the performance of existing facilities based on section 308 questionnaire data in terms of proportional flow in order to determine what additional value could be used as a safeguard to protect source waters against entrainment, especially in smaller waterbodies or in waterbodies where the intake is disproportionately large as compared to the source water body. (In practice, EPA expects that these requirements would require a facility to relocate or obtain water from another source, e.g., a public water supply or groundwater, only in smaller waterbodies, because no new facilities in larger waterbodies that use wet recirculating cooling systems would ever run afoul of these requirements.) In order to assess the performance of new facilities in meeting these requirements, EPA examined the performance of existing facilities and determined that 90 percent of existing facilities in freshwater rivers and streams and 92 percent of existing facilities in estuaries or tidal rivers meet these requirements. Based on documents included in the record, EPA also believes that most existing facilities meet the proportional flow requirement for lakes and reservoirs. EPA expects that new facilities would have even more potential to plan ahead to select locations and design intake capacity that meet these requirements. EPA recognizes that these requirements are conservative in order to account for the cumulative impact of multiple facilities' intakes. The 1 percent value for estuaries reflects that the area under influence of the intake will move back and forth near the intake and that withdrawing 1 percent of the volume of water surrounding the intake twice a day over time would diminish the aquatic life surrounding the intake. The 5 percent value for rivers and streams reflects an estimate that this would entrain approximately 5 percent of the river or stream's entrainable organisms and a policy judgment that a greater degree of entrainment reflects an inappropriately located facility. Because they are overwhelmingly achievable for new facilities, EPA believes they are appropriate to this new facility rule.

Proportional flow limitations are one way to provide protection for aquatic life and enhancement of commercial and recreational uses of source waters. Larger proportionate withdrawals of water may result in commensurately greater levels of entrainment. Entrainment impacts of cooling water intake structures are closely linked to the amount of water passing through the intake structure, because the eggs and larvae of some aquatic species are free-floating and may be drawn with the flow of cooling water into an intake structure. Sizable proportional withdrawals from a stream or river might also change the physical character of the affected reach of the river and availability of suitable habitat, potentially affecting the environmental or ecological value to the aquatic organisms. In lakes or reservoirs, the proportional flow requirement limits the total design intake flow to a threshold below which it will not disrupt the natural thermal (and dissolved oxygen) stratification and turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies). See § 125.84(b)(3)(ii). The proportional flow requirement for lakes and reservoirs would primarily protect aquatic organisms in small to medium-sized lakes and reservoirs by limiting the intake flow to a capacity appropriate for the size of the waterbody. In estuaries and tidal rivers, EPA's proportional flow requirement uses a volume that relates specifically to the cooling water intake structure and the area it influences (see § 125.83). Organisms in this area of influence travel back and forth with the tides and so may be exposed to the intake multiple times. The proportional flow requirement for estuaries and tidal rivers will limit the withdrawal of a sizable proportion of the organisms within the area of influence, commensurately reducing the entrainment of aquatic organisms.

d. Additional and Alternative Best Technology Available Requirements

At § 125.84(e), the final rule recognizes that a State may, under sections 401 or 510 of the CWA, ensure the inclusion of any more stringent requirements relating to the location, design, construction, and capacity of a cooling water intake structure at a new facility that are necessary to ensure attainment of water quality standards, including designated uses, criteria, and antidegradation requirements.

EPA interprets the CWA to authorize State and Tribal permit authorities to require more stringent limitations on intake where necessary to protect any provision of State law, including State water quality standards. Commenters have asserted that EPA does not have such authority under CWA section 301(b)(1)(C), arguing that authority is limited to controls on discharges of pollutants. Leaving that question open, there is ample authority under CWA sections 510 and 401, as is consistent with the goals of the CWA articulated in section 101 of the CWA, to provide EPA ample authority for such a provision. Section 510 of the CWA provides, in relevant part:

> Except as provided in this Chapter, nothing in this chapter shall (1) preclude or deny the right of any State or political subdivision therefore * * * to adopt or enforce * * * (B) any requirement respecting control or abatement of pollution * * * except that if an * * * other limitation * * * or standard of performance is in effect under this chapter, such State * * * may not adopt or enforce any * * * other limitation * * * or standard of performance which is less stringent than the * * * other limitation * * * or standard of performance under this chapter.

EPA interprets this to reserve for the States the authority to implement requirements that are more stringent than the Federal requirements under state law. PUD No. I of Jefferson *County* v. *Washington Dep't of Ecology*, 511 U.S. 700, 705 (1994). (As recognized by section 510 of the Clean Water Act, 33 U.S.C. 1370, States may develop water quality standards more stringent than required by this regulation.). Further, section 401(d) of the CWA provides, in relevant part,

> Any certification provided under this section shall set forth any effluent limitations and other limitations, and monitoring requirements necessary to assure that any applicant for a Federal license or permit will comply with any applicable effluent limitations and other limitations, under section 1311 or 1312 of this title, standard of performance under 1316 of this title, or prohibition, effluent standard, or

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pretreatment standard under section 1317 of this title, and with any other appropriate requirement of state law set forth in such certification, and shall become a condition on any Federal license or permit subject to the provisions of this section."

In *PUD No. I of Jefferson County* v. *Dep't of Ecology*, 511 U.S. 700, 711 (1994), the Supreme Court held that this provision is not "specifically tied to a 'discharge'." ("The text refers to the compliance of the applicant, not the discharge. Section 401(d) thus allows the State to impose 'other limitations' on the project in general to assure compliance with various provisions of the Clean Water Act and with "any other appropriate requirement of State law.") Thus, section 401(d) provides states with ample authority in their 401 certifications to require EPA to include any more stringent limitations in order to meet the requirements of state law. These two sections of the CWA further the objectives of the act to "restore and maintain the chemical, physical, and biological integrity of the nation's waters," the interim goal to protect water quality and are consistent with the CWA policy to "recognize, preserve, and protect the primary responsibility and rights of States to prevent, reduce, and eliminate pollution" and "to plan the development and use * * * of water resources." CWA sections 101(a) and (b).

2. What Technologies Are Available To Meet the Regulatory Requirements

a. Track I: Capacity

The technical availability of the two-track option is demonstrated by information in EPA's record showing that each component of Track I, the "fast-track" option, can be achieved through the use of demonstrated technologies. Intake capacity reduction commensurate with use of a wet closed-cycle recirculating cooling system as required by § 125.84(b)(1) can be achieved using a recirculating wet cooling tower or cooling pond. Such a closed-cycle recirculating cooling system is a commonly practiced technology among the new facilities controlled by this rule. The Technical Development Document shows that 67 percent of new in-scope facilities (10 new coal-fired power plants, 64 new combined-cycle power plants, and 7 manufacturing facilities) would install a closed-cycle recirculating cooling system independently of this rule.

While manufacturers use closed-cycle recirculating cooling systems to a lesser extent than do electric power generators, manufacturers also have opportunities to recycle or reuse their cooling water to reduce their water intake capacity. To examine the extent to which new manufacturing facilities are likely to reuse and recycle cooling water, the Agency reviewed the engineering databases that support the effluent limitations guidelines for several categories of industrial point sources. In general, this review identified extensive use of recycling or reuse of cooling water in documents summarizing industrial practices in the late 1970s and early 1980s, as well as increased recycling and reuse of cooling water in the 1990s. For example, the reuse of cooling water in the manufacturing processes was identified in the pulp and paper and chemicals industries, in some cases as part of the basis for an overall zero discharge requirement (inorganic chemicals). Other facilities reported reuse of a portion of the cooling water that was eventually discharged as process wastewater, with some noncontact cooling water discharged through a separate outfall or after mixing with treated process water.

For manufacturing facilities, flow reduction techniques differ between facilities and industry sectors. Facilities use unheated noncontact cooling water for condensing of excess steam produced via cogeneration; they use unheated contact and noncontact cooling water for in-process needs; and they frequently reuse process waters and wastewaters for contact and noncontact cooling.

The chemical and allied products sector and the petroleum refining sector demonstrate similar cooling water practices. Both sectors utilize cooling water for condensing of excess steam from cogeneration and for critical process needs. Most process cooling water is noncontact cooling water and generally is not reused as process water (though it may be recirculated). Paper and allied products facilities generally reuse cooling water and cogenerated steam throughout their processes (though the level to which this occurs differs among facilities). Primary metals industries utilize cooling water for contact and noncontact cooling and for condensation of steam from onsite electric power generation. Contrary to the other sectors, the primary metals industries have no general purpose for cogenerated steam in their processes.

In general, the cooling requirement for cogeneration in these manufacturing sectors is less than for the same power generated by utility and nonutility power plants. Regardless of this fact, this rule requires that the intake of water used for this purpose (and not reused as process water) must be minimized according to the same technology-based performance requirements as for other steam electric generating facilities. The condensing of excess steam from cogeneration is the same process at manufacturers as at utility and nonutility power plants. Therefore, EPA does not distinguish between requirements for this activity.

For the purposes of this regulation, EPA considers the withdrawal of water for use and reuse as both process and cooling water analogous to the reduction of cooling water intake flows achieved through the use of a recirculating cooling water system. For example, some facilities transfer excess process heat to a water stream and subsequently reuse the heated stream for other process purposes. In this case there is considerable conservation of water and energy by the reuse of cooling water. Alternatively, some facilities often withdraw water first for a process application and subsequently reuse it as cooling water. EPA encourages such practices and, in turn, considers these techniques analogous to flow reduction for the purposes of meeting the capacity reduction requirements of this rule. To meet the intake capacity requirements at § 125.84(b)(1) a new manufacturing facility must, to the maximum extent practicable, reuse and recycle cooling water withdrawn for purposes other than steam electric condensing. Cooling water intake used for the purposes of condensing of exhaust steam from electricity generation must be reduced to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system using minimized make-up and blowdown flows. EPA concludes that for manufacturers the capacity requirement meets the criterion of best technology available commercially at an economically practicable cost.

b. Track I: Velocity

EPA examined the technical feasibility of the required through-screen velocity of 0.5 ft/s. This requirement relies on the appropriate design of the intake structure relative to intake flow to reduce velocity or installation of certain hard technologies (e.g., wedgewire screens and velocity caps) to change the configuration of the structure so that the effects of velocity on aquatic organisms are minimized. EPA's record demonstrates that these designs and technologies are widely used in the industries subject to this rule. Since there are a number of intake technologies currently in use that are designed to meet a 0.5 ft/s through-screen velocity, the technologies that can achieve the Track I velocity technology-based performance

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costs with the revenues the facility is expected to generate. Under this test, EPA has determined that on average, the rule will constitute 0.3, 1.2, and 0.14 percent of projected annual revenue for new combined-cycle power plants, coal-fired power plants, and manufacturing facilities, respectively. The cost to-revenue ratio is estimated to range from 0.7 percent to 5.2 percent of revenues for steam electric generating facilities and less than 0.1 percent to 0.5 percent of annual revenues for manufacturing facilities. None of the 38 projected new manufacturing facilities was estimated to incur annualized compliance costs greater than 1 percent of annual revenues. Based on EPA's analysis, the steam electric generating facilities projected to be in scope of this rule are able to afford these economic impacts. In general, the Agency concludes that economic impacts on the electric generating industry from this final rule would be economically practicable, because the facilities required to comply with the requirements would be able to afford the technologies necessary to meet the regulations.

Finally, since the analysis for new facilities entails some uncertainty because it reflects a projection into the future, EPA is maintaining in the final rule a provision in the regulation authorizing alternative requirements where data specific to the facility indicate that compliance with the requirement at issue would result in costs wholly out of proportion to the costs EPA considered in this analysis. See § 125.85 of this rule.

Considering the economic impacts on the electric generating industry as a whole, today's final rule only applies to those electric generating facilities that generate electricity with a steam prime mover and that meet certain requirements (e.g., have or need to have an NPDES permit, withdraw equal to or greater than 2 MGD from waters of the U.S.). As summarized in Exhibit 1 and Exhibit 2 above, an analysis of the NEWGen database shows that only 69 out of the 241 new combined-cycle facilities (28.6 percent) would be subject to this rule, and only 14 out of 35 new coal-fired facilities (40.5 percent).

For the manufacturer industry sectors with at least one new facility that is subject to this final rule, an analysis of the data collected using the Agency's section 316(b) Industry Detailed Questionnaire for existing facilities indicates that only 472 of the 1,976 nationally estimated existing facilities have an NPDES permit and directly withdraw cooling water from waters of the U.S. Of these 472 facilities, only 406 facilities are estimated to withdraw more than two (2) MGD. Of these 406 facilities, only 296 facilities are estimated to use more than 25 percent of their total intake water for cooling water purposes. Thus, this finding of economic practicability is further supported because only 15 percent of the manufacturing industry sectors will incur costs under this rule. According to EPA's analysis, economic impacts on the manufacturing facilities from this final rule would be economically practicable because the facilities projected to be in scope of this rule would be able to afford the technologies necessary to meet the regulations.

C. Why EPA Is Not Adopting Dry Cooling as the Best Technology Available for Minimizing Adverse Environmental Impact?

In establishing best technology available for minimizing adverse environmental impact the final rule, EPA considered an alternative based on a zero-intake flow (or nearly zero, extremely low flow) requirement commensurate with levels achievable through the use of dry cooling systems. Dry cooling systems (towers) use either a natural or a mechanical air draft to transfer heat from condenser tubes to air. In conventional closed-cycle recirculating wet cooling towers, cooling water that has been used to cool the condensers is pumped to the top of a recirculating cooling tower; as the heated water falls, it cools through an evaporative process and warm, moist air rises out of the tower, often creating a vapor plume. Hybrid wet-dry cooling towers employ both a wet section and dry section and reduce or eliminate the visible plumes associated with wet cooling towers.

In evaluating dry cooling-based regulatory alternatives, EPA analyzed a zero or nearly zero intake flow requirement based on the use of dry cooling systems as the primary regulatory requirement in either (1) all waters of the U.S. or (2) tidal rivers, estuaries, the Great Lakes, and oceans. The Agency also considered subcategorization strategies for the new facility regulation based on size and types of new facilities and location within regions of the country, since these factors may affect the viability of dry cooling technologies.

EPA rejects dry cooling as best technology available for a national requirement and under the subcategorization strategies described above, because the technology of dry cooling carries costs that are sufficient to pose a barrier to entry to the marketplace for some projected new facilities. Dry cooling technology also has some detrimental effect on electricity production by reducing energy efficiency of steam turbines and is not technically feasible for all manufacturing applications. Finally, dry cooling technology may pose unfair competitive disadvantages by region and climate. Further, the two-track option selected is extremely effective at reducing impingement and entrainment, and while the dry cooling option is slightly more effective at reducing impingement and entrainment, it does so at a cost that is more than three times the cost of wet cooling. Therefore, EPA does not find it to represent the "best technology available" for minimizing adverse environmental impact. EPA recognizes that dry cooling technology uses extremely low-level or no cooling water intake, thereby reducing impingement and entrainment of organisms to dramatically low levels. However, EPA interprets the use of the word "minimize" in CWA section 316(b) to give EPA discretion to consider technologies that very effectively reduce, but do not completely eliminate, impingement and entrainment as meeting the requirements of section 316(b) the CWA.

Although EPA has rejected dry cooling technology as a national minimum requirement, EPA does not intend to restrict the use of dry cooling or to dispute that dry cooling may be the appropriate cooling technology for some facilities. This could be the case in areas with limited water available for cooling or waterbodies with extremely sensitive biological resources (e.g., endangered species, specially protected areas). An application of dry cooling will virtually eliminate use of cooling water and impingement and entrainment, in almost all foreseeable circumstances, would reduce a facility's use of cooling water below the levels that make a facility subject to these national minimum requirements.

1. Barrier to Entry

EPA has determined that higher capital and operating costs associated with dry cooling may pose barrier to entry for some new sources in certain circumstances. (In general, barrier to entry means that it is too costly for a new facility to enter into the marketplace). A minimum national requirement based on dry cooling systems would result in annualized compliance cost of greater than 4 percent of revenues for all of 83 projected electric generators within the scope of the rule. For 12 generators, costs would exceed 10% of revenues. EPA's economic analysis demonstrates that a regulatory alternative based on a

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aquatic life use. However, to the extent that the lack of an aquatic life use would result in Track I requirements achieving limited reductions in impingement and entrainment at a site, a permit applicant willing to conduct site-specific studies under Track II might be able to demonstrate that alternative technologies or approaches would reduce the level of impingement mortality and entrainment to a level of reduction comparable to the level the facility would achieve if it met the Track I requirements at that location. EPA addressed use impairment and the stress that cooling water intake structures may add to impaired waterbodies at VI. B. above.

D. Flow and Volume

Under the proposed rule, EPA proposed limitations on intake flow and volume for new facilities that varied depending on the type of waterbody upon which the facility is to be located. Specifically, intake flows at facilities whose cooling water intake structure withdraws from freshwater lakes and rivers would be limited to the lower of five (5) percent of the source water body mean annual flow or twenty-five (25) percent of the 7Q10. Facilities located on lakes and reservoirs would be limited to intake flows that do not disrupt, alter the natural thermal stratification or turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies). Intakes in tidal rivers and estuaries would be limited to no more than one (1) percent of the volume of the water column in the area centered about the opening of the intake, with a diameter defined by the distance of one tidal excursion at the mean low water level. The additional requirement of intake flow commensurate with that of a closed-cycle recirculating cooling water system was proposed for intakes located in either estuaries and tidal rivers or the littoral zone of any waterbody.

EPA requested comment on each proposed limitation by waterbody type, unique situations such as the Great Lakes, and the introduction of more stringent flow requirements for intakes in estuaries, tidal rivers, and littoral zones.

In general, commenters opposed the proposed flow and volume limitations. They argued that EPA did not present a link between intake flows and adverse impact, that the limits are based on questionable grounds, and that EPA lacked the authority to enact such limits, and against specific items in each proposed waterbody limitation.

On the basis of the supporting data presented in the proposed rule and the NODA, Track I and Track II of today's final rule maintain the proposed flow limitations with some changes. EPA believes the record contains ample evidence to support the proposition that reducing flow and capacity reduces impingement and entrainment, one measure of adverse environmental impact, and may reduce stress on higher levels of ecological structure including population and communities. (See, #2–029, 2–013L–R15 and 2–013J). EPA also has determined that a capacity- and location-based limit on withdrawals in certain waterbody types is an achievable requirement that will have little or no impact on the location of cooling water intake structures projected to be built over the next 20 years.

1. Relation of Flow and Capacity to Impact

Several commenters disagreed with EPA's contention that a high intake flow volume necessarily corresponds to higher rates of adverse environmental impact. Commenters pointed to several facilities with relatively high intake volumes that reported no significant loss of aquatic life due to entrainment or impingement. The commenters asserted that, collectively, these cooling systems showed no significant impact on the recovery of impaired aquatic species or on the overall health of the aquatic population. By contrast, some commenters faulted EPA's proportional flow requirements for failing to account for cumulative impacts in waterbodies that have been previously designated as sensitive. In their view, such waters would suffer a disproportionate impact from high intake volumes than would less sensitive waters. Relying heavily on a flow-based requirement would ignore this potentially ecologically harmful effect.

Many commenters also disagreed with the notion that flow-induced entrainment automatically equates to adverse impact. Commenters argued that any intake flow would likely result in some entrainment loss but that this does not substantially harm the biological community of the source water. To support this, commenters provided examples that demonstrate healthy sport and commercial fishing populations in close proximity to large power plants. Citing these examples, commenters argued that EPA's proposed best technology available requirements based on entrainment and impingement are overly restrictive and cost prohibitive. Instead, commenters proposed basing the 316(b) requirements more on the overall health and viability of the surrounding aquatic environment than on rates of entrainment and impingement.

On the other hand, some commenters supported EPA's assertion that volume and impact are directly proportional. One commenter provided statistical evidence from several cooling system studies that demonstrated higher rates of entrainment and impingement when intake volumes were increased.

Several commenters questioned EPA's emphasis on reducing intake flow to minimize impact while ignoring other influential factors, such as life history strategy, distribution throughout the water column, and adaptations to external stresses, among others, that can result in high entrainment and impingement mortality rates. The commenters argued that such factors can often be mitigated by structural design or location modifications without incurring the expense associated with a reduction in the overall volume of water withdrawn. Similarly, other commenters noted that EPA failed to address technologies and design modifications that could achieve the desired effect—reduction in entrainment and impingement losses—while still maintaining a high rate of withdrawal.

EPA believes the record contains ample evidence to support the proposition that reducing flow and capacity reduces impingement and entrainment, one measure of adverse environmental impact, and may reduce stress on higher levels of ecological structure including population and communities. (*See* DCN #2–029 in the record for this rule (compilation of swim speed data), which demonstrates the potential vulnerability of many fish species to impingement. The documents DCN #2–013L–R15 and 2–013J support the proposition that flow is related to entrainment.) The widespread use of capacity-reduction technology at almost all proposed new electric generating facilities and by a substantial number of new manufacturers makes capacity reduction an appropriate component of best technology available for minimizing adverse environmental impact at new facilities. EPA disagrees with commenters that other factors influential to impingement and entrainment have been ignored. Both Track I and Track II of the final rule allow for site-specific evaluations in determining the appropriate technologies to be implemented. For example, the Design and Construction Technology Proposal Plan required in Track I and the Evaluation of Potential

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Cooling Water Intake Structure Effects in Track II allow for site specific consideration of factors other than flow to minimize impacts from impingement and entrainment. Cumulative impacts are addressed on a case-by-case basis by each permitting authority.

2. Basis for Flow Proportional Limits

Numerous commenters rejected the justification for the flow requirement proposed by EPA as being too vague and untenable. Specifically, commenters questioned the proposed goal of a "99 percent level of protection" for aquatic communities and how it relates to levels of protectiveness in other water quality-based programs. Many commenters believed both "99 percent" and "level of protection" were vague and called on EPA to provide more explicit definitions in the final rule. Other commenters questioned the gain in overall aquatic health that can be achieved by setting the requirement at such a high level. Several commenters cited other federal programs and publications, such as the *Water Quality Standards Handbook*, in support of their claim that EPA has no precedent on which to base its proposed requirement. Other programs have demonstrated that a lower target protection level is still adequately protective of the viability of the total aquatic environment. Commenters noted that a high standard would increase compliance costs significantly while producing no measurable improvement in the overall health of the source waterbody and called on EPA to better justify its support of the proposed requirement.

While EPA believes this final rule will significantly increase protection for aquatic communities, the Agency has determined that the proportional flow requirements represent limitations on capacity and location that are technically available and economically practicable for the industry as a whole. EPA examined the performance of existing facilities based on data from the section 316(b) industry survey in terms of proportional flow to determine what additional value could be used as a safeguard to protect against impingement and entrainment, especially in smaller waterbodies, where multiple intakes are located on the same waterbody, or in waterbodies where the intake is disproportionately large as compared to the source water body. As discussed in Section V.B.1.c. above, EPA found most existing facilities meet these requirements. EPA expects that new facilities would have even more potential to plan ahead and select locations that meet these requirements. EPA recognizes that some measure of judgment was involved in establishing the specific numeric limits in these requirements and that these requirements are conservative in order to account for multiple intakes affecting a waterbody. In particular, the 1 percent value for estuaries reflects that the area under influence of the intake will move back and forth near the intake and withdrawing 1 percent of the volume of water surrounding the intake twice a day over time would diminish the aquatic life surrounding the intake. The 5 percent value mean annual flow reflects an estimate that this would entrain approximately 5 percent of the river or stream's organisms and a policy judgment that such a degree of entrainment reflects an inappropriately located facility. Nevertheless, because they address important operation situations and appear to be highly achievable for new facilities, EPA believes they are appropriate to this rule.

These requirements are expected to have little or no impact on the location of cooling water intake structures projected to be built over the next 20 years as new facilities have the opportunity to choose sites that meet their specific design and cooling water needs before construction begins.

E. Velocity

1. Design Through-Screen Velocity as a Standard Measure

Under the proposed rule, any intake located in a freshwater or tidal river, stream, estuary, or ocean or within or near the littoral zone of a lake or reservoir would have to meet a maximum intake velocity requirement: a design through-screen intake velocity of 0.5 feet per second (ft/s).

EPA requested comment on the appropriateness of design through-screen velocity as a standard measure with 0.5 ft/s as the intake velocity, and the utility and appropriateness of a nationally based velocity requirement for the 316(b) regulations. Comments addressed these topics, as well as a range of other issues: problems with biofouling, issues better addressed through a site-specific approach, applicability to offshore oil and gas facilities, and applicability to existing facilities.

Generally, industry commenters thought the 0.5 ft/s requirement to be overprotective and not supported by the scientific literature. On the other hand, states and public interest groups commenters agreed with this requirement. Commenters also gave examples of several situations in which the velocity requirement would be inappropriate. Comments on the NODA generally reiterated issues raised in the comments on the proposed rule.

Numerous commenters questioned the proposed intake velocity requirement on several grounds. Many of the comments suggested that the proposed requirement is based on limited scientific data and undocumented or unsupported government policies. Commenters generally cited the age of the data used to support the requirement, the small number of scientific studies upon which the requirement is based, and the unclear origins of existing government policies that advocate using the 0.5 ft/s requirement. Other commenters stated that the requirement is very conservative and still may not prevent adverse environmental impact. A number of commenters pointed to other factors that affect impingement and entrainment, such as light, turbidity, temperature, and fish behavior. Other commenters suggested alternative requirements, including 1.0 ft/s, an allowable range of velocity from 0.5 ft/s to 1.0 ft/s, a species-specific velocity requirement dependent on the species composition of nearby waters, and a case-by-case velocity limit. Several other commenters further noted that a number of existing facilities with intake velocities exceeding 0.5 ft/s have been determined to be in compliance with 316(b) or to have minimal impacts to fish populations. Other commenters questioned the record support for determining the safety factor used in deriving the proposed velocity requirement. Some commenters supported the velocity requirement, with one commenter noting that it is well-established as a protective requirement and is consistent with the levels of protection required under other existing regulations.

Several commenters expressed concern over the use of design through-screen velocity as the proposed requirement. Some pointed out that approach velocity has been the accepted standard for measuring velocity and questioned the lack of justification for proposing a different methodology. One commenter noted that a specific measure of velocity may be better suited for the design of a particular intake (e.g., through-screen velocity for a wedgewire screen and sweeping velocity for an angled screen). Another commenter opposed the use of design through-screen velocity, arguing that it is difficult to measure and does not represent the velocity that fish must detect in order to avoid impingement. Others noted that a through-screen velocity of 0.5 ft/s would, by definition,

require an approach velocity of less than 0.5 ft/s. A commenter also questioned the appropriateness of using through-screen velocity, because intake screens can easily become clogged or fouled, having a dramatic effect on velocity and water flows at and through the screen. Other commenters supported the use of design through-screen velocity, noting that it has long been the industry and regulatory standard for measuring intake velocity. Several commenters suggested methods for measuring approach velocity.

Finally, several commenters drew comparisons with existing velocity requirements used by NMFS Northwest Region. Some of these comments requested that the proposed requirement be fully consistent with the existing NMFS requirements. Others noted that the proposed requirements are actually more stringent than the NMFS requirements when compared using a flow vector analysis, contrary to the Agency's statement that the proposed requirements were less stringent than NMFS requirements.

Given the compilation of supporting data presented in the proposed rule and the NODA, Track I of today's final rule maintains the proposed intake velocity requirement of 0.5 ft/s through-screen velocity. The 0.5 ft/s through-screen requirement is well supported by existing literature on fish swim speeds and will also serve as an appropriately protective measure. EPA believes a requirement that protects almost all fish and life stages is particularly appropriate to provide a margin of safety when, as is common, screens become occluded by debris during the operation of a facility and velocity increases through the portions of a screen that remain open. EPA notes that more than 70 percent of the manufacturing facilities and 60 percent of the electricity generating facilities built in the past 15 years have met this requirement and believes the requirement is an appropriate component of best technology available for minimizing adverse environmental impact at new facilities.

As documented by the data collected for the NODA, EPA believes the 0.5 ft/s requirement is scientifically based, technically sound, protective of aquatic resources, and technically available and economically practicable as demonstrated by the fact that it is frequently achieved at recently built facilities. As discussed below, the requirement is well supported by existing literature on fish swim speeds and will also serve as an appropriate protective measure, since the data suggest that a 0.5 ft/s intake velocity would protect 96 percent of the tested fish. EPA notes that if the permit applicant does not want to meet the specific Track I velocity requirement, the applicant can, under Track II, conduct site-specific studies and seek to demonstrate comparable reduction of impingement mortality and entrainment. This may allow facilities to install cooling water intake structures with greater that 0.5 ft/s velocities if they can demonstrate that they would have the same reduction of impingement and entrainment as Track I standards which include the 0.5 ft/s limitation on velocity. Additionally, past permitting decisions were made using the best judgment at the time of the decision. These permitting decisions should not be interpreted to signify best technology available in future decisions.

The NODA presented further data on fish swim speeds. The velocity of water entering a cooling water intake structure exerts a direct physical force against which fish and other organisms must act to avoid impingement and entrainment. An analysis of swim speed data demonstrates that many fish species are potentially unable to escape the intake flow and avoiding being impinged. EPA received or collected data from EPRI (see W–00–03 316(b) Comments 2.11), from a University of Washington study that supports the current National Marine Fisheries Service velocity requirement for intake structures, and from references included in comments from the Riverkeeper (see Turnpenny, 1988, referenced in W–00–03 316(b) Comments 2.06; document found in DCN #2–028B in the record for this rule). These data were compiled into a graph (Swim Speed Data, DCN #2–029 in the record of this rule). The data suggest that a 0.5 ft/s velocity would protect 96 percent of the tested fish.

In developing the intake velocity requirement, EPA assumed a flat screen with the intake flow directly perpendicular to the face of the screen, because this is a typical arrangement for a cooling water intake structure. However, angled screens, such as those described in the NMFS requirements, are used in some intake designs, and EPA does not wish to discourage any intake designs. Under § 125.84(e), the Director may require additional controls (such as the NMFS requirements) to complement the protection afforded by the velocity requirement. EPA also developed the velocity requirement with a highly protective intake velocity in mind, regardless of the intake configuration. As a result, EPA's requirements may be more stringent than existing requirements required by NMFS or other agencies.

EPA recognizes that approach velocity has been a measurement technique for intake velocity in the past. However, many recently constructed facilities have been designed to meet through-screen intake velocity limitations. Additionally, EPA notes that design through-screen velocity will be simpler to measure and therefore be easier to implement on a national level for both regulators and facilities than approach velocity. New facilities can be designed with consideration given to the through-screen velocity requirement, and designs can be altered accordingly. Intake velocity will also be simpler to measure, as facility engineers can simply calculate the intake velocity on the basis of intake flow and the intake screen area, as opposed to the more complex data gathering process involved in measuring approach velocities near an intake screen. EPA also recognizes that the approach velocity will be less than 0.5 ft/s. The intake velocity requirement is intended to be a highly protective requirement. Regardless of the intake structure design or the presence of sufficient detection or avoidance cues, the intake velocity is low enough to protect of a majority of fish species. For these reasons, the final rule maintains the requirement to measure intake velocity on a design through-screen basis.

2. Appropriateness of a National Velocity Requirement

Numerous comments were received regarding the appropriateness of a national-scale requirement for intake velocity. Many commenters expressed concern that a national requirement would be an unnecessary burden on facilities. Specifically, some commenters noted that a site-specific framework for the 316(b) rule and velocity requirement would be preferable, as it would best account for site-specific details, some of which may affect the rates of impingement and entrainment. Other commenters questioned using a national requirement; given the variability in environmental conditions and fish swim speeds, these commenters said making a national approach is inappropriate to suitably cover the range of organisms found in a given water body. Some commenters noted that the velocity requirement might preclude the future use or implementation of some highly effective technologies. One commenter noted that several studies have suggested little or no correlation between flow and impingement or entrainment; the commenter argued that, therefore, a relationship between

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impingement or entrainment and intake velocity does not exist.

As documented by the data collected for the NODA, the 0.5 ft/s requirement is scientifically based, is protective of aquatic resources with a reasonable margin of safety, and is met by many recently built facilities. EPA believes it is an appropriate component of best technology available for minimizing adverse environmental impact at new facilities. Permit applicants who wish to build a facility using higher intake velocities have the option, under Track II, to conduct site-specific studies and seek to demonstrate that their alternative will reduce impingement mortality and entrainment to a level of reduction comparable to the level the facility would achieved if it met the Track I requirements, including the velocity limit of 0.5 ft/s.

While EPA acknowledges that multiple factors may affect impingement and entrainment at a given intake, EPA believes that there is ample evidence contained in the record to support a correlation between velocity and/or flow and impingement and entrainment. As stated in the preamble to the rule, intake velocity is one of the key factors affecting the impingement of fish and other aquatic biota. The velocity of water entering a cooling water intake structure exerts a direct physical force against which fish and other organisms must act to avoid impingement and entrainment. The compilation of swim speed data (DCN #2–029 in the record of the rule) demonstrates that many fish species are potentially unable to escape the intake flow and avoid being impinged. The record also supports the proposition that flow is related to entrainment.[89]

Finally, EPA chose a national requirement in order to provide a consistent standard for facilitating implementation given the technical availability and economic practicability of the requirement.

3. Other Comments Concerning the Velocity Proposal

a. Biofouling at Intakes

Several commenters submitted that an intake velocity of 0.5 ft/s may lead to increased difficulties with biofouling at facility intakes, especially at offshore oil and gas extraction facilities. Another commenter noted that with an increase in biofouling facilities would need to increase treatment efforts. Frequently, these efforts involve adding chemical treatments to water flows and may have subsequent adverse impacts on water quality. Another management strategy noted by a commenter is to maintain sufficiently high intake velocities to preclude colonization by fouling organisms. One commenter also expressed concern over the implications of biofouling at fine mesh screens and the potential for these protective technologies to become quickly fouled. One commenter supported the velocity requirement, noting that commercially available alloys have been shown to be highly effective in repelling biofouling organisms.

EPA recognizes that maintaining sufficiently high intake velocities is one possible solution for minimizing settlement by biofouling organisms. However, further research by the Agency suggests that this is not the most effective technique. Often, intake velocities are designed to be as low as possible to reduce the impingement and entrainment of aquatic organisms. Additionally, the intake systems of many facilities are unprepared to support such high intake velocities and would possibly require modifications in order to maintain such velocities. An analysis of facility survey data at existing facilities suggested that only 33 (3.4 percent) of 978 surveyed facilities have intake velocities of sufficient magnitude (greater than 5 ft/s) to inhibit biofouling. Fortunately, a variety of viable alternative technologies and management strategies for dealing with biofouling are available. Examples of these options include the use of construction materials that inhibit attachment of organisms, mechancial cleaning, and chemical and/or heat treatments. While no one strategy has been shown to be universally applicable, there are certainly affordable and implementable options. Maintaining a high intake velocity has not been shown to be the most effective way to control biofouling, since other methods have been shown to be more effective at a lower cost, especially in the context of new facilities. A facility that has yet to be constructed can integrate biofouling control technologies into its design and minimize the impacts of biofouling on normal operations.

b. Concerns Better Addressed by a Site-Specific Approach

Several commenters raised other concerns about the proposed velocity requirement, pointing to a variety of issues that they argue could be more easily addressed on a site-specific level. Some commenters noted that intakes located on large or fast-moving waterbodies may have difficulty maintaining the proposed intake velocity. For example, an intake located in a river moving at 3.0 ft/s may be unable to maintain a constant 0.5 ft/s intake velocity because of the ambient flow. As for the biota near the intake, the commenters submitted that these organisms have adapted to a higher-velocity environment and do not necessarily require protection under a velocity requirement. Other commenters noted that the direction of flow near an intake can have a substantial effect on the intake velocity and detection by fish. For example, the intake velocity at an intake subject to tidal movements or a longshore current may be affected. Another commenter expressed concern that the intake velocity is meaningful only if measured where the screen is the first component of the cooling water intake structure encountered by an organism, such as with a wedgewire screen. Intake canals, trash racks, and other cooling water intake structure components pose a threat by potentially entrapping fish that are unable to locate an escape route. One commenter noted that experimental technologies, such as strobe lights, sound, or intake velocities greater than 0.5 ft/s (up to 10 ft/s for some technologies) may not be developed because of the restrictions on intakes. One commenter observed that a reduction in intake velocity may also reduce the amount of cooling water taken in by a facility. The commenter observed that reducing the cooling capacity of the cooling system may adversely affect facility safety and efficiency.

For faster-moving waterbodies and in other situations where a permit applicant may wish to use a higher intake velocity, facilities may opt to follow Track II and seek to demonstrate that reductions in impingement mortality and entrainment would be comparable to the level achieved with the Track I requirements. Given the data EPA has seen on the protective nature of the 0.5 ft/s requirement (see DCN #2–028 in the Docket for the rule), EPA does not foresee a significant issue regarding entrapping fish and will continue in Track I to specify design through-screen velocity as the measure for determining compliance with the velocity requirement. EPA also notes that facilities wishing to employ developmental technologies may follow Track II and demonstrate a comparable level of protection.

For new facilities, EPA does not anticipate that cooling system safety for nuclear-fueled facilities will be an issue

[89] The documents DCN# 2–013L–R15 (Goodyear, 1997, Mathematical Methods to Evaluate Entrainment of Aquatic Organisms by Power Plants) and DCN# 2–013J (EPRI, 1999, Catalog of Assessment Methods for Evaluating the Effects of Power Plant Operations on Aquatic Organisms.) in the record of the rule both support this premise.

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is constructed on the same property and connects to the facility's cooling water intake structure behind the intake pumps, and the design capacity of the cooling water intake structure has not been increased. This facility would not be considered a "new facility" even if routine maintenance or repairs that do not increase the design capacity were performed on the intake structure.

Ocean means marine open coastal waters with a salinity greater than or equal to 30 parts per thousand (by mass).

Source water means the water body (waters of the U.S.) from which the cooling water is withdrawn.

Thermocline means the middle layer of a thermally stratified lake or reservoir. In this layer, there is a rapid decrease in temperatures.

Tidal excursion means the horizontal distance along the estuary or tidal river that a particle moves during one tidal cycle of ebb and flow.

Tidal river means the most seaward reach of a river or stream where the salinity is typically less than or equal to 0.5 parts per thousand (by mass) at a time of annual low flow and whose surface elevation responds to the effects of coastal lunar tides.

§ 125.84 As an owner or operator of a new facility, what must I do to comply with this subpart?

(a)(1) The owner or operator of a new facility must comply with either:

(i) Track I in paragraph (b) or (c) of this section; or

(ii) Track II in paragraph (d) of this section.

(2) In addition to meeting the requirements in paragraph (b), (c), or (d) of this section, the owner or operator of a new facility may be required to comply with paragraph (e) of this section.

(b) *Track I requirements for new facilities that withdraw equal to or greater than 10 MGD.* You must comply with all of the following requirements:

(1) You must reduce your intake flow, at a minimum, to a level commensurate with that which can be attained by a closed-cycle recirculating cooling water system;

(2) You must design and construct each cooling water intake structure at your facility to a maximum through-screen design intake velocity of 0.5 ft/s;

(3) You must design and construct your cooling water intake structure such that the total design intake flow from all cooling water intake structures at your facility meets the following requirements:

(i) For cooling water intake structures located in a freshwater river or stream, the total design intake flow must be no greater than five (5) percent of the source water annual mean flow;

(ii) For cooling water intake structures located in a lake or reservoir, the total design intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies);

(iii) For cooling water intake structures located in an estuary or tidal river, the total design intake flow over one tidal cycle of ebb and flow must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level;

(4) You must select and implement design and construction technologies or operational measures for minimizing impingement mortality of fish and shellfish if:

(i) There are threatened or endangered or otherwise protected federal, state, or tribal species, or critical habitat for these species, within the hydraulic zone of influence of the cooling water intake structure; or

(ii) There are migratory and/or sport or commercial species of impingement concern to the Director or any fishery management agency(ies), which pass through the hydraulic zone of influence of the cooling water intake structure; or

(iii) It is determined by the Director or any fishery management agency(ies) that the proposed facility, after meeting the technology-based performance requirements in paragraphs (b)(1), (2), and (3) of this section, would still contribute unacceptable stress to the protected species, critical habitat of those species, or species of concern;

(5) You must select and implement design and construction technologies or operational measures for minimizing entrainment of entrainable life stages of fish and shellfish if:

(i) There are threatened or endangered or otherwise protected federal, state, or tribal species, or critical habitat for these species, within the hydraulic zone of influence of the cooling water intake structure; or

(ii) There are or would be undesirable cumulative stressors affecting entrainable life stages of species of concern to the Director or any fishery management agency(ies), and it is determined by the Director or any fishery management agency(ies) that the proposed facility, after meeting the technology-based performance requirements in paragraphs (b)(1), (2), and (3) of this section, would contribute unacceptable stress to these species of concern;

(6) You must submit the application information required in 40 CFR 122.21(r) and § 125.86(b);

(7) You must implement the monitoring requirements specified in § 125.87;

(8) You must implement the record-keeping requirements specified in § 125.88.

(c) *Track I requirements for new facilities that withdraw equal to or greater than 2 MGD and less than 10 MGD and that choose not to comply with paragraph (b) of this section.* You must comply with all the following requirements:

(1) You must design and construct each cooling water intake structure at your facility to a maximum through-screen design intake velocity of 0.5 ft/s;

(2) You must design and construct your cooling water intake structure such that the total design intake flow from all cooling water intake structures at your facility meets the following requirements:

(i) For cooling water intake structures located in a freshwater river or stream, the total design intake flow must be no greater than five (5) percent of the source water annual mean flow;

(ii) For cooling water intake structures located in a lake or reservoir, the total design intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies);

(iii) For cooling water intake structures located in an estuary or tidal river, the total design intake flow over one tidal cycle of ebb and flow must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level;

(3) You must select and implement design and construction technologies or operational measures for minimizing impingement mortality of fish and shellfish if:

(i) There are threatened or endangered or otherwise protected federal, state, or tribal species, or critical habitat for these species, within the hydraulic zone of influence of the cooling water intake structure; or

(ii) There are migratory and/or sport or commercial species of impingement

concern to the Director or any fishery management agency(ies), which pass through the hydraulic zone of influence of the cooling water intake structure; or

(iii) It is determined by the Director or any fishery management agency(ies) that the proposed facility, after meeting the technology-based performance requirements in paragraphs (c)(1) and (2) of this section, would still contribute unacceptable stress to the protected species, critical habitat of those species, or species of concern;

(4) You must select and implement design and construction technologies or operational measures for minimizing entrainment of entrainable life stages of fish and shellfish;

(5) You must submit the application information required in 40 CFR 122.21(r) and § 125.86(b)(2), (3), and (4);

(6) You must implement the monitoring requirements specified in § 125.87;

(7) You must implement the recordkeeping requirements specified in § 125.88.

(d) *Track II.* The owner or operator of a new facility that chooses to comply under Track II must comply with the following requirements:

(1) You must demonstrate to the Director that the technologies employed will reduce the level of adverse environmental impact from your cooling water intake structures to a comparable level to that which you would achieve were you to implement the requirements of paragraphs (b)(1) and (2) of this section.

(i) Except as specified in paragraph (d)(1)(ii) of this section, this demonstration must include a showing that the impacts to fish and shellfish, including important forage and predator species, within the watershed will be comparable to those which would result if you were to implement the requirements of paragraphs (b)(1) and (2) of this section. This showing may include consideration of impacts other than impingement mortality and entrainment, including measures that will result in increases in fish and shellfish, but it must demonstrate comparable performance for species that the Director, in consultation with national, state or tribal fishery management agencies with responsibility for fisheries potentially affected by your cooling water intake structure, identifies as species of concern.

(ii) In cases where air emissions and/or energy impacts that would result from meeting the requirements of paragraphs (b)(1) and (2) of this section would result in significant adverse impacts on local air quality, significant adverse impact on local water resources not addressed under paragraph (d)(1)(i) of this section, or significant adverse impact on local energy markets, you may request alternative requirements under § 125.85.

(2) You must design and construct your cooling water intake structure such that the total design intake flow from all cooling water intake structures at your facility meet the following requirements:

(i) For cooling water intake structures located in a freshwater river or stream, the total design intake flow must be no greater than five (5) percent of the source water annual mean flow;

(ii) For cooling water intake structures located in a lake or reservoir, the total design intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water except in cases where the disruption is determined to be beneficial to the management of fisheries for fish and shellfish by any fishery management agency(ies);

(iii) For cooling water intake structures located in an estuary or tidal river, the total design intake flow over one tidal cycle of ebb and flow must be no greater than one (1) percent of the volume of the water column within the area centered about the opening of the intake with a diameter defined by the distance of one tidal excursion at the mean low water level.

(3) You must submit the application information required in 40 CFR 122.21(r) and § 125.86(c).

(4) You must implement the monitoring requirements specified in § 125.87.

(5) You must implement the record-keeping requirements specified in § 125.88.

(e) You must comply with any more stringent requirements relating to the location, design, construction, and capacity of a cooling water intake structure or monitoring requirements at a new facility that the Director deems are reasonably necessary to comply with any provision of state law, including compliance with applicable state water quality standards (including designated uses, criteria, and antidegradation requirements).

§ 125.85 May alternative requirements be authorized?

(a) Any interested person may request that alternative requirements less stringent than those specified in § 125.84(a) through (e) be imposed in the permit. The Director may establish alternative requirements less stringent than the requirements of § 125.84(a) through (e) only if:

(1) There is an applicable requirement under § 125.84(a) through (e);

(2) The Director determines that data specific to the facility indicate that compliance with the requirement at issue would result in compliance costs wholly out of proportion to those EPA considered in establishing the requirement at issue or would result in significant adverse impacts on local air quality, significant adverse impacts on local water resources not addressed under § 125.84(d)(1)(i), or significant adverse impacts on local energy markets;

(3) The alternative requirement requested is no less stringent than justified by the wholly out of proportion cost or the significant adverse impacts on local air quality, significant adverse impacts on local water resources not addressed under § 125.84(d)(1)(i), or significant adverse impacts on local energy markets; and

(4) The alternative requirement will ensure compliance with other applicable provisions of the Clean Water Act and any applicable requirement of state law.

(b) The burden is on the person requesting the alternative requirement to demonstrate that alternative requirements should be authorized.

§ 125.86 As an owner or operator of a new facility, what must I collect and submit when I apply for my new or reissued NPDES permit?

(a)(1) As an owner or operator of a new facility, you must submit to the Director a statement that you intend to comply with either:

(i) The Track I requirements for new facilities that withdraw equal to or greater than 10 MGD in § 125.84(b);

(ii) The Track I requirements for new facilities that withdraw equal to or greater than 2 MGD and less than 10 MGD in § 125.84(c);

(iii) The requirements for Track II in § 125.84 (d).

(2) You must also submit the application information required by 40 CFR 122.21(r) and the information required in either paragraph (b) of this section for Track I or paragraph (c) of this section for Track II when you apply for a new or reissued NPDES permit in accordance with 40 CFR 122.21.

(b) *Track I application requirements.* To demonstrate compliance with Track I requirements in § 125.84(b) or (c), you must collect and submit to the Director the information in paragraphs (b)(1) through (4) of this section.

(1) *Flow reduction information.* If you must comply with the flow reduction requirements in § 125.84(b)(1), you must submit the following information to the