

**ACRS Questions for Withdrawal of Regulatory Guide 4.4,  
“Reporting Procedure for Mathematical Models Selected to Predict Heated  
Effluent Dispersion in Natural Water Bodies”**

**(1) What did the Regulatory Guide support?**

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 51, “Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions,” Subpart A, “National Environmental Policy Act – Regulations Implementing Section 102(2),” the Commission prepares an environmental impact statement for consideration in the licensing actions of certain nuclear facilities. In addition, in accordance with 10 CFR 51.50, each applicant for a construction permit, early site permit or combined license shall submit an environmental report. According to 10 CFR 51.10(c), the NRC recognizes that responsibility for Federal regulation of nonradiological pollutant discharges into receiving waters rests by statute with the Environmental Protection Agency (EPA). Finally, according to 10 CFR 51.45(d), “[t]he environmental report shall also include a discussion of the status of compliance with applicable environmental quality standards and requirements including, but not limited to ... thermal and other water pollution limitations or requirements which have been imposed by Federal, State, regional, and local agencies having responsibility for environmental protection.”

**(2) What was the purpose of the Regulatory Guide?**

Section 5.1 of Regulatory Guide (RG) 4.2, “Preparation of Environmental Reports for Nuclear Power Stations,” suggests that details of the mathematical modeling methods used in predicting heated effluent dispersion should be given in an appendix to the Environmental Report.

Regulatory Guide 4.4, “Reporting Procedure for Mathematical Models Selected to Predict Heated Effluent Dispersion in Natural Water Bodies,” presents a procedure acceptable to the NRC staff for providing an appendix with summary details of mathematical modeling methods used in predicting the dispersion of heated effluent. The regulatory position in the RG presents a template for a table of specific attributes of the model or models used in the analyses performed by the applicants, and gives instructions to complete entries in the table. This uniform reporting format, called a Model Assessment Table (MAT), was designed to aid NRC staff in assessing proposed thermal discharge mathematical models and analyses.

**(3) How was the Regulatory Guide used?**

The Regulatory Guide was intended for use in the application and licensing of new nuclear power plants. Applicants were advised to use the Regulatory Guide as they prepared the environmental report as part of the license application.

- (4) **Why is the Regulatory Guide no longer needed?** (Reference any document that supersedes the regulatory guide.)

EPA's National Pollutant Discharge Elimination System (NPDES) program regulates the discharge of effluents (including heated water) into natural water bodies and requires analyses for permitted discharge. EPA supported the development of a model (CORMIX) for NPDES analyses that is generally used by both the applicants and NRC staff. A few other well-accepted models for heated effluent dispersion also exist and are used in license applications and by the NRC staff in its reviews. With the availability of this small number of widely accepted models for heated effluent dispersion, applicants are no longer following the explicit guidance given in the Regulatory Guide to provide a Model Assessment Table because the NRC staff is familiar with the models being used.

- (5) **What guidance is available once the Regulatory Guide is removed?**

Given the small number of widely accepted models for this purpose, there is no longer a need for a uniform Model Assessment Table. Considerable EPA guidance exists to support the NPDES program. Industry groups, such as the American Petroleum Institute, also have guidance to support these analyses.

- (6) **What are the possible “ripple effects” on other documents?** (Identify documents that could be affected by the withdrawal.)

There will be no “ripple effect” from the withdrawal of Regulatory Guide 4.4.

- (7) **What is the basis for believing that no guidance similar to that in the Regulatory Guide will ever be needed?** (Verify that no licensee would be adversely affected by the withdrawal of the regulatory guide.)

EPA supported the development of a widely accepted, publicly available model named CORMIX for NPDES analyses that is generally used by both applicants and NRC staff. Also, CORMIX analyses are routinely accepted in the 45 states that administer NPDES-related programs.

- (8) **Will generic guidance still be needed?**

Generic guidance is embodied in the CORMIX model and user documentation. In addition, given the small number of widely accepted models for this purpose, there is no longer a compelling need for a uniform Model Assessment Table.

- (9) What is the rationale for withdrawing this Regulatory Guide instead of revising it?**  
(Verify that the methods/techniques presented in the guide no longer provide an acceptable approach or does not otherwise provide useful information.)

The need for this guidance has been superseded by the development, distribution, and acceptance of CORMIX, the EPA model, and a few other widely accepted models for the dispersion of heated effluent.

- (10) Is the Regulatory Guide referenced in other documents?**

Regulatory Guide 4.4 is provided as a reference in section 2.4.11, "Low Water Considerations" of the Standard Review Plan (NUREG-0800). However, the RG is not cited anywhere in the text. The RG is also not cited in inspection guidance.

In a number of safety evaluation reports for early site permits, there are general references to the RG providing guidance on the selection and use of surface water models for analyzing the flow field and dispersion of contaminants in surface water.

- (11) Do other agencies rely upon the Regulatory Guide, e.g., the Agreement States, National Aeronautical and Space Administration, Department of Energy?**

No.