



# BACKGROUND

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## Nuclear Power Plant Licensing Process

The Nuclear Regulatory Commission licenses and regulates the operation of U.S. commercial nuclear power plants. Currently operating nuclear power plants were licensed under a two-step process described in Title 10 of the Code of Federal Regulations (10 CFR) under Part 50. This process requires both a construction permit and an operating license.

The NRC worked to improve regulatory efficiency and add greater predictability to the process by establishing an alternative licensing process, 10 CFR Part 52, in 1989. Part 52 includes a combined license that provides a construction permit and an operating license with conditions for plant operation.



Construction oversight

Other licensing options under Part 52 include Early Site Permits, where applicants can obtain approval for a reactor site without specifying the design of the reactor(s) that could be built there, and certified standard plant designs, which can be used as pre-approved designs.

In either Part 50 or 52, NRC approval is necessary before a nuclear power plant can be built and operated. The NRC maintains oversight of the construction and operation of a facility throughout its lifetime to ensure the plant complies with the agency's regulations for the protection of public health and safety, the common defense and security, and the environment.

### Two-Step Licensing Process (10 CFR Part 50)

All nuclear power plant applications must undergo an NRC safety review, environmental review and an antitrust review.

In order to construct or operate a nuclear power plant, an applicant must submit a Safety Analysis Report. This document contains the design information and criteria for the proposed reactor, and comprehensive data on the proposed site. It also discusses various hypothetical accident situations and the safety features of the plant that would prevent accidents or lessen their effects. In addition, the application must contain a comprehensive assessment of the environmental impact of the proposed plant. A prospective licensee also must submit information for antitrust reviews of the proposed plant.

When a company applies for permission to construct a nuclear plant, the NRC staff first determines whether the application contains enough information to accept it and begin a detailed review.

If the NRC accepts the application, the agency holds a public meeting near the proposed site to familiarize the public with the safety and environmental aspects of the proposed application, including the planned location and type of plant, the regulatory process, and the terms for public participation in the licensing process. Several public meetings of this type are held during reactor licensing reviews.

All documents and correspondence related to the application are placed in the agency document database, ADAMS, and in the NRC Public Document Room located in Rockville, Md. The NRC uses press releases and social media to inform relevant federal, state, and local officials, as well as news outlets near the proposed plant, about receipt of the application. The agency also publishes a notice of receipt of the application in the *Federal Register*.

The NRC staff then reviews the application to determine whether the plant design meets all applicable regulations (10 CFR Parts 20, 50, 73, and 100). The review includes, in part:

- site characteristics, such as surrounding population, seismology, meteorology, geology and hydrology;
- design of the nuclear plant;
- the plant's anticipated response to hypothetical accidents;
- plant operations, including the applicant's technical qualifications to operate the plant;
- discharges from the plant into the environment (i.e., radiological effluents); and
- emergency plans.

The NRC summarizes its review in a Safety Evaluation Report on the proposed facility's anticipated effect on public health and safety.

The Advisory Committee on Reactor Safeguards, an independent group that provides advice on reactor safety to the five-member Commission, reviews each application to construct or operate a nuclear power plant. The ACRS review begins early in the licensing process, and a series of meetings with the applicant and the NRC staff are held at appropriate times in the review process. When the ACRS has completed its review, it submits the results in a report to the Commission via a letter to the Chairman of the NRC.

The NRC follows the National Environmental Policy Act by reviewing and evaluating the potential environmental impacts and benefits of the proposed plant. The agency summarizes this review in a Draft Environmental Impact Statement for comment by the appropriate federal, state, and local agencies as well as by the public. Afterwards, the agency issues a Final Environmental Impact Statement that addresses all comments received.

The Atomic Energy Act requires that a public hearing be held before a construction permit is issued for a nuclear power plant. This hearing is conducted by a three-member Atomic Safety and Licensing Board (one lawyer, who acts as chairperson, and two technically qualified persons). Members of the public may submit written or oral statements to the licensing board to be entered into the hearing record, or they may petition to intervene as full parties in the hearing.

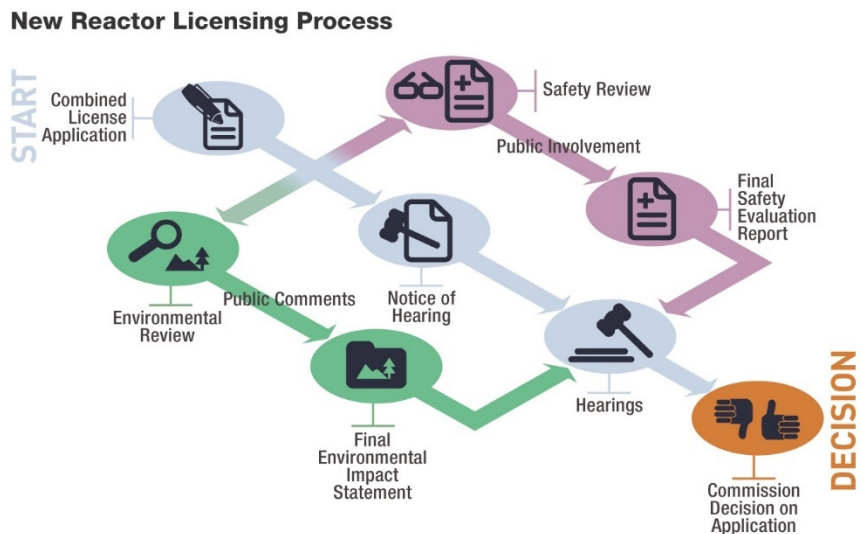
The NRC may authorize the licensee to do some activities at the site prior to the issuance of a construction permit. This Limited Work Authorization excludes any nuclear safety-related activities and the licensee would have to restore the site if the permit is rejected. This authorization may be granted only after the licensing board acknowledges all of the NEPA findings required by the Commission's regulations for authorizing construction. The board must also determine there is reasonable assurance that the proposed site is a suitable location, from a radiological health and safety standpoint, for a nuclear power reactor of the general size and type proposed.

The applicant must submit a Final Safety Analysis Report to support its application for an operating license. This report describes the final design of the facility, as well as its operational and emergency procedures. The NRC prepares a Final Safety Evaluation report for the operating license, and the ACRS makes an independent evaluation and presents its advice to the Commission.

A public hearing is not mandatory or automatic for operating license applications. However, the NRC's publication of a *Federal Register* notice on accepting an application for an operating license provides the public an opportunity for those whose interests might be affected by the issuance of the license to request a hearing. If a public hearing is held it follows the process described earlier.

### Combined License (10 CFR Part 52)

A combined license under Part 52 authorizes construction of the facility much like a construction permit would under Part 50's two-step process. A combined license application must contain essentially the same information required in an application for an operating license issued under Part 50 and specify the inspections, tests, and analyses that the applicant must perform. It also specifies acceptance criteria necessary to provide reasonable assurance that the facility has been constructed and will be operated in agreement with the license and applicable regulations. If the application does not reference an early site permit or design certification (see below), then the NRC reviews the technical and environmental information as described for the two-step licensing process. There is also a mandatory hearing for a combined license.



After issuing a combined license, the Commission authorizes operation of the facility only after verifying that the licensee completed required inspections, tests, and analyses and that acceptance criteria were met. The NRC publishes notices of these completions in the *Federal Register*. At least 180 days prior to the date scheduled for initial loading of fuel, the NRC will publish a notice of intended operation of the facility in the *Federal Register*. There is a limited opportunity for a hearing at this time, only for petitions that demonstrate the licensee has not met or will not meet the acceptance criteria.

## Early Site Permits

An early site permit resolves site safety, environmental protection, and emergency preparedness issues independent of a specific nuclear plant design. The early site permit application must address the safety and environmental characteristics of the site and evaluate potential obstacles to developing an acceptable emergency plan. The application covers the following information:

- site boundaries;
- seismic, meteorologic, hydraulic and geologic data;
- existing and projected future population of the surrounding area;
- evaluation of alternative sites;
- proposed general location of each plant planned to be on the site;
- number, type and power level of the plants planned for the site;
- maximum discharges from the plant;
- type of plant cooling system to be used;
- radiation dose consequences of hypothetical accidents; and
- plans for coping with emergencies.

The NRC documents its findings on site safety characteristics and emergency planning in a Safety Evaluation Report and on environmental protection issues in Draft and Final Environmental Impact Statements.



Mandatory hearing conducted by the Commission

An early site permit can also allow for a limited work authorization to perform non-safety site preparation activities before a combined license is issued. After the NRC staff and the ACRS complete their safety reviews, the NRC issues a *Federal Register* notice for a mandatory public hearing. The early site permit is initially valid for no less than 10 and no more than 20 years and can be renewed for 10 to 20 years.

## Design Certification

The NRC may approve and certify a standard nuclear plant design through a rulemaking, independent of a specific site. The design certification is valid for 15 years. A design certification application must contain proposed inspections, tests, analyses, and acceptance criteria for the standard design. The application must also demonstrate how the applicant complies with the Commission's relevant regulations.

The NRC bases its safety review of the application primarily on the information submitted by the applicant. An application must contain enough design information for the Commission to reach a final

conclusion on all safety questions associated with the design. In general terms, a design certification application should provide an essentially complete nuclear plant design, with the exception of some site-specific design features.

The application presents the design basis, the limits on operation, and a safety analysis of structures, systems, and components of the facility as a whole. The scope and contents of the application are equivalent to the level of detail found in a Final Safety Analysis Report for a currently operating plant. The NRC's Safety Evaluation Report summarizes its review of the plant design and how the design meets applicable regulations.

The ACRS reviews each application for a standard design certification, together with the NRC staff's safety evaluation report, in a public meeting. Upon determining that the application meets the relevant standards and requirements of the Atomic Energy Act and the Commission's regulations, the Commission drafts a rule to issue the standard design certification as an appendix to the 10 CFR Part 52 regulations. Members of the public may submit written or oral comments on the proposed design certification rule.

The issues resolved in a design certification rulemaking are more difficult to change than issues resolved under other licensing processes. The NRC cannot modify a certified design unless it finds that the design does not meet the applicable regulations in effect at the time of the design certification, or it is necessary to modify the design to assure adequate protection of the public health and safety.

An application for a combined license under 10 CFR Part 52 can incorporate by reference a design certification and/or an early site permit. The advantage of this approach is that the issues resolved during the design certification rulemaking and the early site permit hearing processes are precluded from reconsideration later at the combined license stage.

More information about these licensing processes is available on the [NRC website](#).

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