



POSITION PAPER

# NRC ANNUAL FEE ASSESSMENT FOR SMALL REACTORS

*October 2010*

***ACKNOWLEDGMENT***

This NEI Position Paper was developed by the NEI Small Modular Reactor Licensing Task Force, which includes representatives from designers, utilities, the Electric Power Research Institute, the National Rural Electric Cooperative Association, and the American Nuclear Society's Special Committee on Small and Medium Reactors, the Department of Energy, and the national laboratories.

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#### **I. Summary**

Nuclear Regulatory Commission (NRC) annual fee regulations in 10 CFR Part 171 require that each operating nuclear power reactor pay the same annual fee, regardless of its size. This policy presents a serious challenge to reactor designers, investors, and potential customers who are currently making investment decisions relative to small and medium reactor designs.

Notably, the Commission is currently considering such a change to its annual fee framework. A 2009 Advance Notice of Proposed Rulemaking (ANPR) sought comment on whether the agency should amend its annual fee rules by establishing a variable annual fee structure for nuclear power reactors based on licensed power limits.<sup>1</sup>

In comments submitted in response to this ANPR, NEI stated its belief that the prior analyses performed by the NRC staff in 1986 and 1995 remain valid and support the conclusion that there is not a relationship or predictive trend between regulatory resources and the type of reactor or the thermal power rating of the reactor. Therefore, we believe there is not an analytical basis for recommending that the annual fee process be changed to a variable fee based on licensed thermal power level. This statement was directed at the currently operating plants and the large advanced power reactors then under licensing review.

However, the comments went on to say that NEI agrees that the current fee structure may not be appropriate for the smaller reactor designs that are referenced in the ANPR and commends the NRC for consideration of their potential incorporation in the fee base. Since these comments were submitted, the inequity of assessing the existing per reactor fee on small and medium reactors has emerged as a significant barrier to commercialization in this country.

Accordingly, NEI's Small Modular Reactor Licensing Task Force ("task force") recommends that, going forward, NRC implement a variable reactor license fee structure, based on licensed power limits, for small and medium reactors licensed after NRC's FY 2010. It is important that any such modification to the existing annual license fee structure achieve the following goals:

- Ensure protection of public health and safety by reimbursing the NRC adequately for the cost of regulatory oversight;
- Utilize a fee structure that shares regulatory oversight costs equitably among large and smaller-scale generation facilities; and
- Ensure that the existing fleet of operating power reactors does not bear the regulatory framework development costs associated with deploying new technologies.

These goals helped shape our recommendation that the NRC implement a variable reactor license fee structure, based on licensed power limits, for small and medium reactors licensed after NRC's FY 2010. The proposed annual fee mechanism contains a floor that establishes a

minimum annual fee for all small reactors and a ceiling which establishes a cap on fees to ensure that newly licensed power reactors above an established threshold are assessed a fee equal to the fee today's operating power reactors will pay, in the future. NEI's specific proposal for amending the NRC annual fee structure for power reactors is discussed as Option 3 below.

## **II. Background**

The NRC is required to collect 90 percent of its annual appropriated budget through two types of fees. One type of fee recovers the NRC's costs of providing services such as licensing and inspection activities to identifiable applicants and licensees. The other is an annual fee paid by all licensees, which recovers generic regulatory expenses and other costs not recovered through fees for specific services. These fees are described in NRC regulations at 10 CFR Part 170 (licensing and inspection services) and 10 CFR Part 171 (annual fees); NEI's proposal is intended to affect only the latter.

The 104 commercial nuclear power reactors now licensed to operate in the United States have licensed power limits ranging from 1500 to 3990 MWt. By contrast, the smaller reactors are expected to have capacities ranging from 30 to 1000 MWt. Another distinction is that some of the smaller reactors may not generate electric power but rather process heat for industrial applications.<sup>2</sup> Current NRC annual fee regulations subject each operating nuclear power reactor to the same annual fee, regardless of its size. In addition, the focus on power reactors does not address reactors designed to produce process heat. For NRC FY 2010, the annual fee assessed for each NRC power reactor is \$4,784,000.

The existing regulatory framework for reactor annual fees presents a serious challenge to reactor investors and potential customers who are currently making decisions of significant economic consequence. The current approach to annual fee determination is a significant disincentive to the development of small and medium reactors because these reactors will be assessed unreasonably high annual fees, particularly for multi-module plants. The NRC is aware of reactor developers' concerns in this area.<sup>3</sup>

10 CFR Part 171 does provide for exemptions to NRC annual fees; see Section 117.11. However, reliance on fee exemption requests on a case-by-case basis, while useful when used infrequently, imposes burdens on the applicant who prepares the exemption application and on the NRC staff who review the request. Seeking individual exemptions from annual fee requirements also is less efficient for routine or widespread industry use. Additionally, the regulations set a relatively high bar for obtaining an exemption, and the outcome is never guaranteed. In turn, this scenario introduces uncertainty as to the annual cost of operating the plant. Interestingly, SECY-10-0034 appears to agree with this assessment of the use of the exemption process, citing it as one reason the agency is considering a rulemaking.

### **III. Scope of issue**

Our recommended approach would apply to all new power reactors licensed after NRC FY 2010.

This recommended approach to assessing NRC annual fees is not intended to change the NRC's current methodology for assigning annual fees for non-power reactors (research and test) or currently licensed power reactors.

### **IV. Current regulatory framework for reactor annual fees**

The current annual fee requirements are found in 10 CFR 171.15, *Annual Fees: Reactor licenses and independent spent fuel storage licenses*, which states in pertinent part:

*(a) Each person holding an operating license for a power, test, or research reactor; each person holding a combined license under part 52 of this chapter after the Commission has made the finding under § 52.103(g); each person holding a part 50 or part 52 power reactor license that is in decommissioning or possession only status, except those that have no spent fuel onsite; and each person holding a part 72 license who does not hold a part 50 or part 52 license shall pay the annual fee for each license held at any time during the Federal fiscal year in which the fee is due. This paragraph does not apply to test and research reactors exempted under § 171.11(a).*

*(b)(1) The FY 2010 annual fee for each operating power reactor which must be collected by September 30, 2010, is \$4,784,000.*

### **V. Proposed alternative regulatory framework for reactor annual fees**

The NRC's 2009 ANPR regarding the possibility of amending NRC annual fee regulations to establish a variable annual fee structure for nuclear power reactors based on licensed power rating reflects the NRC staff's receptivity to a new regulatory framework in this area. To facilitate progress on this issue, we would support issuance of an NRC proposed rule establishing a fee structure for small and medium reactors that reimburses the NRC adequately for the cost of oversight, avoids a fee structure that penalizes the development and deployment of smaller reactors, and ensures that the existing fleet of nuclear plants does not bear the regulatory framework development costs associated with smaller reactor development. As outlined below, our proposal also includes several new definitions of key terms in Part 171. Industry's approach is further informed by our review and analysis of the public comments submitted in response to the NRC's 2009 ANPR.

#### **A. Definitions of Key Terms**

We propose that a reactor's licensed thermal power rating be used as the basis for its annual fee. In our view, the thermal power rating is a more useful criterion than the electric power rating because it includes nuclear plants that may be used for industrial applications (e.g., process heat)

as well as for electric power generation. This distinction is particularly important for smaller reactors that have unique characteristics suitable for industrial uses.

For purposes of Part 171, industry proposes the following definitions:

Small Reactors	$\leq 1,000$ MWt
Medium Reactors	$> 1,000$ MWt, $\leq 2,000$ MWt
Large Reactors	$> 2,000$ MWt

#### Small Reactors

Small reactors are defined as the class of reactor having a licensed thermal power rating  $\leq 1,000$  MWt. This size criterion is the rough thermal equivalent to that used by the International Atomic Energy Agency (IAEA) for small reactors.

#### Medium Reactors

Medium reactors are defined as the class of reactor having a licensed thermal power rating greater than 1,000 MWt but less than or equal to 2,000 MWt. This size criterion is roughly equivalent to that used by the IAEA for medium reactors.<sup>4</sup>

#### Large Reactors

Large reactors are defined as having a licensed thermal power rating greater than 2,000 MWt. This definition covers the vast majority of currently operating reactors as well as the LWRs currently being licensed.

#### Multi-Module Nuclear Plant

A multi-module nuclear plant is defined as a facility that houses multiple, co-located, small or medium nuclear reactors (modules). The licensed thermal power rating for a multi-module nuclear plant is the sum of the licensed thermal power rating of all modules licensed for operation. We intend that for each fee assessment period the NRC will re-evaluate the current sum of the licensed thermal power rating of all modules licensed for operation and apply that total to the formula identified in Option 3.

An upper power level for multi-module plants that can be assessed one annual fee must be established to maintain equity with large reactors. Because Price Anderson includes an upper limit for multi-module plants of 1,300 MWe, we propose to use its thermal equivalent of 4,000 MWt to define the upper limit that a multi-module plant can be considered a single facility for the purposes of annual fee assessment. If an operator adds additional capacity to a multi-module facility above this limit, an additional annual fee will be assessed based on the combined MWt output in excess of the 4,000 MWt limit. If the Price Anderson legislation is modified, NRC should evaluate a corresponding change as well.

### Minimum Fee

A minimum annual fee is proposed for all small reactors with a licensed thermal power rating less than or equal to 250 MWt. This threshold is consistent with longstanding NRC policy on differentiating small reactors from larger ones for emergency planning purposes.<sup>5</sup>

### Maximum Fee

A maximum fee is proposed for all reactors and multi-module facilities with licensed thermal power ratings in excess of 2,000 MWt. It is intended that this annual fee cap be implemented so that, in any given year, all plants exceeding the 2,000 MWt threshold pay the same fee as all currently operating plants.

## **B. Industry Analysis of ANPR Public Comments and Proposed Options**

The NRC received numerous comments from the public in response to its 2009 ANPR on Variable Annual Fee Structure for Power Reactors. Members of the ANS Special Committee on Small and Medium Reactors reviewed and “binned” the comments to discern the various approaches presented and the concerns identified regarding methods to best assure an equitable annual fee structure. The results of this ANS analysis are summarized below as Options 1, 2 and 3. Industry supports Option 3 because it better satisfies the goal of an equitable annual fee structure for nuclear reactors that reimburses the NRC adequately for the cost of oversight, avoids a fee structure that penalizes the development and deployment of small and medium reactors, and ensures that the existing reactor fleet does not bear the regulatory framework development costs associated with deploying small reactors.

### ***Option 1: No Rule Change to 10 CFR 171.11(c)***

It is recognized that the current NRC annual fee structure provides stability in the budgeting process for the existing fleet of large nuclear power plants. Some comments on the ANPR proposed that the NRC keep the existing annual fee rule until the agency conducts a new study for small and medium reactors similar to that conducted in conjunction with the 1986 rulemaking to establish the initial annual fee. That NRC study, which included a review of inspection and licensing fees over a one-year period, concluded that there was “no necessary relationship or predictive trend between thermal megawatt rating of a reactor and the NRC regulatory costs.”<sup>6</sup> We think it unlikely that a new study would reach a different conclusion, i.e., show significant differences in NRC regulatory costs for existing reactors above a certain thermal megawatt rating. Although there have been significant enhancements in plant performance over the past 24 years that may have reduced some oversight requirements, other changes, such as those related to plant security, have tended to offset reduced oversight in other areas.

However, reductions in regulatory burden are expected to accrue for small and medium reactors and multi-module plants because of their unique design features. Intuitively, their smaller physical footprint, reduced systems, structures and components, and reduced staffing should reduce the required regulatory oversight.

For reactor designers, investors, and potential customers who are currently making decisions of economic consequence, the “No Rule Change” approach introduces significant uncertainty into the investor/customer decision-making process because it increases the likelihood that small and medium reactors may face unreasonably high annual fees on a reactor basis, particularly for multi-module plants. Reliance on fee exemption requests on a case-by-case basis is not an optimal long-term solution. We therefore recommend that the NRC not pursue this option.

### ***Option 2: A Safety-Based Annual Fee Structure***

Because of the significant reduction in risk postulated in Probabilistic Risk Assessment (PRA) studies conducted for the next generation of nuclear plants, another possible approach discussed in the ANPR comments is to consider an annual fee structure based on a combination of rated thermal power and indicators of overall risk such as Core Damage Frequency. The premise is that nuclear plants with reduced risk of core damage and a smaller source term represent a lesser risk and a commensurate reduction in generic costs associated with NRC oversight. In this model, the core thermal power would serve as a measure of the size of the fission product source term. This approach would be applied to all nuclear power reactors, thereby offering the potential for fee reductions to plants with lower risk factors. It also encourages a risk-based approach to nuclear power generation.

In our view, the primary difficulty with this approach is that it introduces a new level of complexity in establishing an annual fee structure. It introduces the question of PRA uncertainty that may encourage significant analysis efforts, NRC review, and costs related to reducing such uncertainties. In addition, this approach does not recognize that the entire commercial fleet currently meets the NRC’s safety goal for core damage frequency and that the past 30 years of fleet operation have demonstrated nuclear plants are safe. We therefore recommend that the NRC not pursue this option.

### ***Option 3: Fee Limits and Variable Fees for Small Reactors and Multi-Module Plants***

Another option is to assess a minimum annual fee from all nuclear power plants to cover generic costs associated with the regulatory oversight. In addition, NRC could implement a variable scale based on thermal power for new reactors with a total licensed thermal power rating less than or equal to 2,000 MWt. For a multi-module plant, the annual fee would be based on the sum of all modules’ licensed thermal power ratings.<sup>7</sup> Last, the annual licensing fee would be capped for all new nuclear plants and multi-module facilities above 2,000 MWt. We believe this is the fairest and most workable approach.

To illustrate:

- (a) Minimum Annual Fee. We propose that a minimum annual fee, or a “base fee,” be applied to all nuclear plants, regardless of size, to cover NRC generic costs. This minimum annual fee will apply to all small reactors with a licensed thermal power rating less than or equal to 250 MWt. The assumption is that such reactors require the minimum regulatory oversight among power-producing nuclear plants.

This assumption is also supported by NRC's allowance in its 1986 rulemaking of an exemption from the full annual fee based on the size of a reactor (which was then approved for two low power reactors: LaCrosse and Big Rock Point). With regard to thermal power and radioactive material inventory, small reactors below the 250 MWt threshold would fall between a test/research reactor and a spent fuel storage facility. A test/research reactor has low thermal power, a small radioactive material inventory, and is assessed an annual fee of \$81,700. A spent fuel storage facility has zero power, significant quantities of radioactive material, and is assessed an annual fee of \$148,000. Therefore, we propose that a reasonable basis for a minimum annual fee would be approximately \$115,000, which falls between the two categories already established by NRC.

- (b) Variable Scale. We propose that the annual fee for new reactors and multi-module nuclear plants be scaled in a linear fashion relative to the licensed thermal power rating for the plant. For a multi-module plant, the licensed thermal power rating is the sum of the licensed thermal power rating of all modules in operation.

The annual fee would be determined by the following formula for plants with a total licensed thermal power rating greater than or equal to 250 MWt and less than or equal to 2,000 MWt.

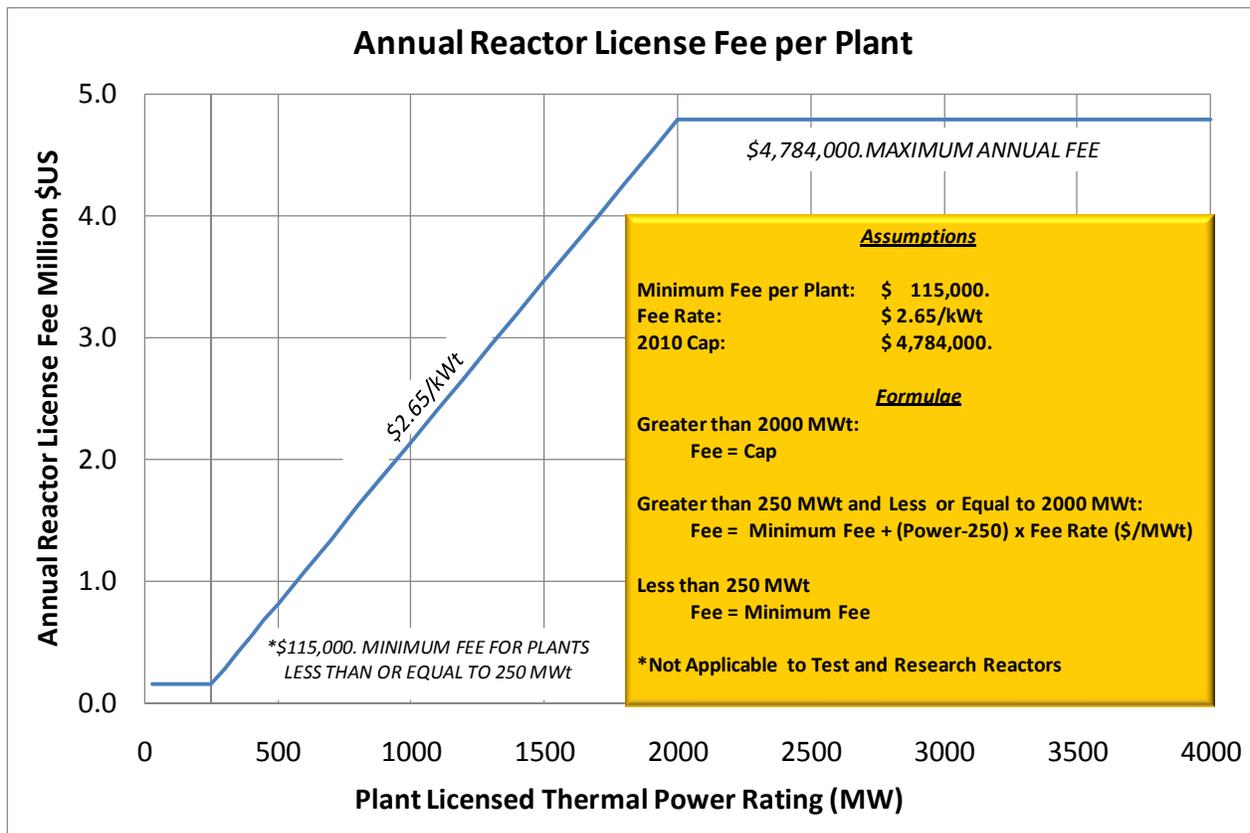
$$\text{Annual Fee} = \text{Minimum Annual Fee} + [\text{Power} - 250](\text{MWt}) \times \text{Fee Rate } (\$/\text{MWt})$$

The variable scale provides a linear interpolation between the minimum and maximum annual fees. The resulting Fee Rate (i.e., slope) using this approach is \$2.65/kWt based on NRC's FY 2010 annual fee structure. The variable scale is not proposed for test, research, and currently licensed power reactors.

- (c) Maximum Annual Fee. It is proposed that the annual fee be capped for all new nuclear power plants (including multi-module plants) with a plant licensed thermal power rating greater than 2,000 MWt. Further, we propose that this maximum fee be the same fee paid by all operating plants in that future year to maintain equity. This would be consistent with the NRC study that indicated that there was "no necessary relationship or predictive trend between thermal megawatt rating of a reactor and the NRC regulatory costs."<sup>8</sup> It is expected that this will remain true for all plants exceeding 2,000 MWt. The FY 2010 annual fee for operating power reactors is \$4,784,000. We understand this number will fluctuate over time based on NRC's required funding levels.

**Annual Fee Structure.** For discussion purposes, the chart below depicts the annual reactor license fee structure based on Option 3 using NRC's FY 2010 annual fee assessment information. We recommend that the NRC implement this approach for newly licensed power reactors based on their thermal output. The proposed mechanism contains a floor with a minimum fee, a ceiling with an annual fee cap, and a variable fee between. It is designed to maintain equity between the fees paid by operating plants today and fees paid by both new power

reactors and multi-module plants that exceed the annual fee cap. It is further designed to ensure that fees assessed on small and medium reactors are equitable with their larger counterparts.



## VI. Recommended Regulatory Framework for New Reactors

NEI urges the NRC to move forward with a rulemaking under 10 CFR Part 171 proposing a variable reactor license fee structure described above in Option 3 for small and medium reactors and multi-module nuclear plants. Such an approach most effectively satisfies the need to ensure protection of public health and safety by reimbursing the NRC adequately for the cost of regulatory oversight; utilizes a fee structure that shares regulatory oversight costs equitably among large and smaller-scale generation facilities; and ensures that the existing fleet of nuclear plants does not bear the regulatory framework development costs associated with deploying new technologies.

Finally, NEI notes the discussion in the enclosure to SECY-10-0034 (item 5.1) in which the NRC staff proposes waiting to resolve this issue within the context of an operating license application:

*Although resolution of this issue before submittal of a license application may be more important to an SMR license applicant trying to support its business case at the design certification stage, the staff believes that resolution of this issue need*

*not occur until after a licensing application is submitted because it concerns activities that will need to be addressed during an operating license review.*

Recognizing that a large annual fee presents a serious challenge to reactor designers, investors, and potential customers who are currently making investment decisions, we highly recommend that the NRC not postpone this rulemaking until after a small reactor license application is submitted.



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<sup>1</sup> 74 Fed. Reg. 12735, *Variable Annual Fee Structure for Power Reactors; Advance notice of proposed rulemaking (ANPR)* (March 25, 2009).

<sup>2</sup> U.S. Nuclear Regulatory Commission, *Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs*, SECY-10-0034, March 28, 2010, p. 19.

<sup>3</sup> *Id.*

<sup>4</sup> International Atomic Energy Agency, *Guidance for preparing user requirements documents for small and medium reactors and their application*, IAEA-TECDOC-11167, August 2000.

<sup>5</sup> See 10 CFR § 50.33(g) for allowance in determining the size of emergency planning zones (EPZs) for gas cooled reactors and for reactors with an authorized power level less than 250 MWt.

<sup>6</sup> 51 Fed. Reg. 24078, 24082-3, *Annual Fee for Nuclear Power Reactors Operating Licenses or Applications and Major Materials Licenses and Conforming Amendment; Proposed rule* (July 1, 1986).

<sup>7</sup> As noted earlier, Price Anderson requirements (42 U.S.C. 2210(b)) state an upper limit for multi-module plants of 1,300 MWe. We propose to retain the MWt equivalent of this value (4,000 MWt) for consistency of treatment of multi-module plants within the regulations.

<sup>8</sup> 51 Fed. Reg. 33224, (September 18, 1986).