

TABLE 4.—CONSERVATIVE ESTIMATES FOR CHEMICAL ELEMENT WEIGHT PERCENTAGES—Continued

Materials	P	Mn
Welds .....	0.019	1.63

TABLE 5.—MAXIMUM HEAT-AVERAGE RESIDUAL [°F] FOR RELEVANT MATERIAL GROUPS BY NUMBER OF AVAILABLE DATA POINTS

Material group	$\sigma$ [°F]	Number of available data points					
		3	4	5	6	7	8
Welds, for Cu > 0.072 .....	26.4	45.7	39.6	35.4	32.3	29.9	28.0
Plates, for Cu > 0.072 .....	21.2	36.7	31.8	28.4	26.0	24.0	22.5
Forgings, for Cu > 0.072 .....	19.6	33.9	29.4	26.3	24.0	22.2	20.8
Weld, Plate or Forging, for Cu ≤ 0.072 .....	18.6	32.2	27.9	25.0	22.8	21.1	19.7

Dated at Rockville, Maryland, this 27th day of September 2007.

For the Nuclear Regulatory Commission.

**Annette L. Vietti-Cook,**

*Secretary of the Commission.*

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## NUCLEAR REGULATORY COMMISSION

### 10 CFR Part 52

RIN 3150-AI19

#### Consideration of Aircraft Impacts for New Nuclear Power Reactor Designs

**AGENCY:** U.S. Nuclear Regulatory Commission.

**ACTION:** Proposed rule.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC or the Commission) is proposing to amend its regulations to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, the applicant shall include in its application a description and evaluation of design features, functional capabilities, and strategies to avoid or mitigate, to the extent practicable, the effects of the aircraft impact with

reduced reliance on operator actions. The impact of a large, commercial aircraft is a beyond-design-basis event, and the NRC's requirements applicable to the design, construction, testing, operation, and maintenance of design features, functional capabilities, and strategies for design basis events would not be applicable to design features, functional capabilities, or strategies selected by the applicant solely to meet the requirements of this rule. The objective of this rule is to require nuclear power plant designers to perform a rigorous assessment of design features that could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

**DATES:** Submit comments on this proposed rule by December 17, 2007. Submit comments on the information collection aspects on this proposed rule by November 2, 2007. Comments received after the above dates will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after these dates.

**ADDRESSES:** You may submit comments by any one of the following methods. Please include the following number RIN 3150-AI19 in the subject line of your comments. Comments on rulemakings submitted in writing or in electronic form will be made available to the public in their entirety on the NRC rulemaking Web site. Personal information, such as your name, address, telephone number, e-mail address, etc., will not be removed from your submission.

Submit comments via the Federal eRulemaking Portal <http://www.regulations.gov>.

*Mail comments to:* Secretary, U.S. Nuclear Regulatory Commission,

Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

*E-mail comments to:* [SECY@nrc.gov](mailto:SECY@nrc.gov). If you do not receive a reply e-mail confirming that we have received your comments, contact us directly at 301-415-1966.

*Hand deliver comments to:* 11555 Rockville Pike, Rockville, Maryland 20852, between 7:30 a.m. and 4:15 p.m. Federal workdays. (Telephone 301-415-1966).

*Fax comments to:* Secretary, U.S. Nuclear Regulatory Commission at 301-415-1101.

You may submit comments on the information collections by the methods indicated in the Paperwork Reduction Act Statement.

Publicly available documents related to this rulemaking may be viewed electronically on the public computers located at the NRC's Public Document Room (PDR), O1 F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The PDR reproduction contractor will copy documents for a fee.

Publicly available documents created or received at the NRC after November 1, 1999, are available electronically at the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this site, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located in ADAMS, contact the PDR Reference staff at 1-800-397-4209, 301-415-4737 or by e-mail to [pdr@nrc.gov](mailto:pdr@nrc.gov).

**FOR FURTHER INFORMATION CONTACT:** Mr. Stewart Schneider, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone 301-415-1462; e-mail: [sxs4@nrc.gov](mailto:sxs4@nrc.gov) or Ms. Nanette Gilles, Office of New Reactors, U.S. Nuclear Regulatory Commission,

<sup>6</sup> Wall thickness is the beltline wall thickness including the clad thickness.

<sup>7</sup> RT<sub>PTS</sub> limits contributes  $1 \times 10^{-8}$  per reactor year to the reactor vessel TWCF.

<sup>8</sup> Excluding underclad cracks in forgings.

Washington, DC 20555-0001; telephone 301-415-1180; e-mail: [nvg@nrc.gov](mailto:nvg@nrc.gov).

#### SUPPLEMENTARY INFORMATION:

- I. Introduction
- II. Currently Operating Power Reactors
- III. Currently Approved Standard Design Certifications
- IV. Renewal of a Standard Design Certification, Combined License, or Manufacturing License
- V. Newly Designed Power Reactors
  - A. Introduction
  - B. Description of Beyond-Design-Basis Aircraft Impact
  - C. Aircraft Impact Assessment
  - D. Evaluation of Design Features, Functional Capabilities, and Strategies
- VI. Section-by-Section Analysis
- VII. Guidance
- VIII. Specific Request for Comments
- IX. Availability of Documents
- X. Plain Language
- XI. Agreement State Compatibility
- XII. Voluntary Consensus Standards
- XIII. Finding of No Significant Environmental Impact: Availability
- XIV. Paperwork Reduction Act Statement
- XV. Regulatory Analysis
- XVI. Regulatory Flexibility Act Certification
- XVII. Backfit Analysis

#### I. Introduction

The Commission believes that it is prudent for nuclear power plant designers to take into account the potential effects of the impact of a large, commercial aircraft. The Commission has determined that the impact of a large, commercial aircraft is a beyond-design-basis event and has chosen an approach consistent with NRC's previous approach to such events. The overriding objective of this rule is to require nuclear power plant designers to perform a rigorous assessment of design and other features that could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions. In this manner, this rule would result in newly designed power reactor facilities being more inherently robust with regard to a potential aircraft impact than if they were designed in the absence of this rule. This rule thus provides an enhanced level of protection beyond that which is provided by the existing adequate protection requirements, which all operating power reactors are required to meet, and which would be provided by the proposed adequate protection requirements that the facilities will be required to meet when finalized (see the proposed 10 CFR part 73, "Physical Protection of Plants and Materials," power reactor security requirements (71 FR 62663; October 26, 2006)).

The proposed rule would require applicants for new standard design

certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval, and those applicants with applications pending on the effective date of this rule (relevant applicants), to perform an aircraft impact assessment of the effects on the designed facility of the impact of a large, commercial aircraft. Based on the insights derived from that assessment, the application would have to include a description and evaluation of the design features, functional capabilities, and strategies to avoid or mitigate the effects of an aircraft impact, addressing core cooling capability, containment integrity and spent fuel pool integrity. The applicant would be required to describe how such design and other features avoid or mitigate, to the extent practicable, the aircraft impact effects with reduced reliance on operator actions.

The Commission has determined that the impact of a large, commercial aircraft is a beyond-design-basis event. For this reason, the Commission-approved final design basis threat (DBT) does not include an aircraft attack. The NRC published its final DBT rule, Title 10, Section 73.1, "Purpose and Scope," of the *Code of Federal Regulations* (10 CFR 73.1), in the **Federal Register** on March 19, 2007 (72 FR 12705). Two well-established bases support the exclusion of aircraft attacks from the DBT. First, it is not reasonable to expect a licensee with a private security force using weapons legally available to it to be able to defend against such an attack. Second, such an act is in the nature of an attack by an enemy of the United States. Power reactor licensees are not required to design their facilities or otherwise provide measures to defend against such an attack, as provided by 10 CFR 50.13, "Attacks and Destructive Acts by Enemies of the United States; and Defense Activities."

The Commission has addressed aircraft attacks by regulatory means other than the DBT rule in 10 CFR 73.1. By Order dated February 25, 2002 (Interim Compensatory Measures (ICM) Order), the Commission required all operating power reactor licensees to develop and adopt mitigative strategies to cope with large fires and explosions from any cause, including beyond-design-basis aircraft impacts (67 FR 9792; March 4, 2002). The Commission has proposed incorporating the continuing requirement to provide for

such mitigative measures in the NRC's regulations in the proposed 10 CFR part 73 power reactor security requirements, specifically the proposed revisions to 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Radiological Sabotage," and Appendix C, "Licensee Safeguards Contingency Plans," to 10 CFR part 73. If these requirements, which are promulgated on the basis of adequate protection of public health and safety and common defense and security, are finalized, all current and future power reactors must satisfy them.

The current requirements, in conjunction with the currently proposed revisions to the security regulations in 10 CFR 73.55 and Appendix C to 10 CFR part 73, will continue to provide adequate protection of the public health and safety and the common defense and security. Nevertheless, the Commission has decided to require relevant applicants to evaluate possible additional features to avoid or mitigate the effects of an aircraft impact beyond satisfying the current regulations and the proposed 10 CFR part 73 regulations (assuming they become final).

The Commission's DBT requirements (both orders and existing rules) are based on adequate protection of the public health and safety and common defense and security. As such, they are excepted from the cost-benefit analysis that otherwise would be required under 10 CFR 50.109, "Backfitting." This new proposed rule to address the capability of newly designed power reactors relative to a potential aircraft impact is based both on enhanced public health and enhanced safety and common defense and security but is not necessary for adequate protection. Rather, it would be to enhance the facility's inherent robustness.

Requiring applicants for new reactor designs to perform a rigorous aircraft impact assessment and describe design features to address the effects of a beyond-design-basis aircraft impact is consistent with the NRC's historic approach to beyond-design-basis events and is consistent with the NRC's position in its "Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants" (50 FR 32138; August 8, 1985) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML003711521). The policy statement notes, "The Commission expects that vendors engaged in designing new standard [or custom] plants will achieve a higher standard of severe accident safety performance than their prior designs." The NRC reiterated that

regulatory approach in its "Policy Statement on the Regulation of Advanced Nuclear Power Plants," dated July 8, 1986 (ADAMS Accession No. ML051660651), "The Commission expects that advanced reactors would provide more margin prior to exceeding safety limits and/or utilize simplified, inherent, passive, or other innovative means to reliably accomplish their safety functions." This regulatory approach has demonstrated its success, as all designs subsequently submitted to and certified by the Commission represent substantial improvement in safety for operational events and accidents. Therefore, the NRC is proposing to require applicants for newly designed facilities to assess the effects of an aircraft impact on the designed facility.

The Commission considered the appropriate location for requirements on an aircraft impact assessment during its deliberations on the security assessment rulemaking (10 CFR 73.62) proposed by the NRC staff in SECY-06-0204, "Proposed Rulemaking—Security Assessment Requirements for New Nuclear Power Reactor Designs (RIN 3150-AH92)," dated September 26, 2006 (ADAMS Accession No. ML062300068). In its Staff Requirements Memorandum on SECY-06-0204, dated April 24, 2007 (ADAMS Accession No. ML071140119), the Commission disapproved the staff's recommended rulemaking as described in SECY-06-0204. The Commission directed the NRC staff to include the aircraft impact assessment requirements in 10 CFR part 52, "Licenses, Approvals, and Certifications for Nuclear Power Plants," (72 FR 49352, August 28, 2007) to encourage reactor designers to incorporate practicable measures at an early stage in the design process. This proposed rule is the result of that effort.

This proposed rule would revise 10 CFR part 52 to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess aircraft impact assessments and describe the design features and other means to avoid or mitigate, to the extent practicable, the effects of an aircraft impact with reduced reliance on operator actions. This proposed rule renders as duplicative and therefore unnecessary the staff's proposed 10 CFR

73.62 rule to require security assessments. That rule would have required a security assessment which would include mitigation of large fires and explosions, a target set analysis, and design features to protect target sets against DBTs. The large fires and explosions provisions of that rule would be subsumed by this proposed 10 CFR part 52 aircraft impact rule. Sufficient target set provisions are included in the NRC's proposed changes to 10 CFR 73.55, which applicants for new facilities would have to satisfy if that rule is made final. Designers of new facilities are encouraged to account for the provisions of 10 CFR 73.55 in the facility design so as to minimize more costly, post-design features to meet those requirements. Accordingly, the proposed 10 CFR 73.62 is not necessary because the Commission is proposing a new 10 CFR part 52 aircraft impact assessment rule.

In contrast to its relation to a possible security assessment rule, however, the new 10 CFR part 52 aircraft impact assessment rule would complement the proposed revisions to 10 CFR 73.55 and Appendix C to 10 CFR part 73, to mitigate the effects of large fires and explosions. The proposed 10 CFR 73.55 and Appendix C to 10 CFR part 73 provisions on mitigating large fires and explosions codify the adequate protection requirement imposed on existing operating reactors by ICM Order, Item B.5.b. These provisions of the proposed 10 CFR part 73 rule, therefore, are necessary for adequate protection and must remain in regulations<sup>1</sup> that are applicable to all currently operating reactors and must be satisfied by all newly licensed reactors.

Regarding large fires and explosions, which are two likely effects of an aircraft impact, the proposed Appendix C to 10 CFR part 73 is limited to mitigative strategies "using existing or readily-available resources," which effectively can be adapted to existing facilities. For example, certain facility features might be virtually cost-free if designed into the facility (e.g., spatially diverse containment penetrations) but effectively impossible to retrofit. Thus, strategies that were not required by ICM Order, Item B.5.b, and are not required by proposed 10 CFR 73.55 and Appendix C to 10 CFR part 73 because they do not use existing or readily available resources, might be implemented in new reactor designs

<sup>1</sup> By Order dated February 25, 2002 (ICM Order), the Commission required all operating power reactors to develop and adopt mitigative strategies to cope with large fires and explosions from any cause, including beyond-design-basis aircraft impacts (67 FR 9792; March 4, 2002).

because of the aircraft impact assessment rule. The proposed aircraft impact assessment rule does not deal with a design basis event but would result in facilities with additional features to avoid or mitigate the effects of an aircraft impact because they would be designed into the facility. Such features would reduce reliance on operator actions to cope with an aircraft impact event. Thus, this proposed rule is not necessary for adequate protection, but rather is an enhancement that will result in newly designed facilities being more inherently robust against aircraft impacts than the facilities not subject to this proposed rule.

In contrast to the adequate protection requirements of proposed 10 CFR 73.55 and Appendix C to 10 CFR part 73, a proposed rule that would enhance safety and security by requiring an evaluation of newly designed facilities to avoid or mitigate the effects of aircraft impacts is appropriate for inclusion in 10 CFR part 52. The NRC is therefore proposing to require applicants for newly designed reactors, which will have to satisfy the revised 10 CFR part 73 provisions if the rule is made final, to also perform an aircraft impact assessment under this proposed rule. However, the NRC expects that, compared to a licensee for a facility that was not designed to meet the requirements of the proposed rule, licensees for facilities that are designed to comply with the proposed rule would have much less of a need to develop specific procedures, guidance, or other strategies to cope with the loss of large areas of the plant due to explosions or fires in order to comply with the requirements in the proposed 10 CFR 73.55 and Appendix C to 10 CFR part 73. The Commission sees this as a significant benefit of this proposed rule; namely, that features to avoid or mitigate the effects of an aircraft impact are designed into the facility and will result in much less reliance on operator actions for such protection.

Consideration of a rule to require applicants for newly designed reactors to perform an aircraft impact assessment and describe design and other features addressing such impacts, which are beyond-design-basis scenarios, is similar to the Commission's consideration in the mid-1980's of new rules addressing accidents more severe than design basis accidents. The 1985 "Policy Statement on Severe Reactor Accidents" explained the Commission's conclusion that, although it was proposing criteria to show new reactor designs to be acceptable for severe accident concerns, then-existing plants posed no undue risk to public health

and safety, and thus, there was no need for action on operating reactors based on severe accident risks. The Commission's reasoning in the severe accident context supports its conclusion that although new reactor designs should be assessed for aircraft impacts and designed to avoid or mitigate the effects of an aircraft impact, existing reactors and designs provide adequate protection of the public health and safety and common defense and security.

## II. Currently Operating Power Reactors

The Commission has determined that the existing designs of currently operating nuclear power plants, together with the security program actions mandated by the NRC's orders (some of which are codified in the NRC's final DBT rulemaking and others of which are being incorporated into other NRC regulations), as well as the protection provided by other Federal, State, and local entities, provide an adequate level of protection to public health and safety and common defense and security against aircraft impacts. As a result of the events of September 11, 2001, the NRC has undertaken a series of actions to provide continued reasonable assurance of adequate protection to public health and safety and common defense and security at the United States commercial nuclear power facilities. The NRC has assessed the potential vulnerabilities of operating nuclear power reactors to aircraft impact, and it has issued orders and provided associated guidance to licensees for implementing a range of mitigative strategies. The results of these aircraft impact assessments were derived from detailed calculations of plant damage mechanisms (e.g., structural failures, shock and vibration effects, and fire effects). The NRC ensured that implementation of the February 25, 2002, ICM Order included measures to mitigate such scenarios.

The Commission's ICM Order, Item B.5.b, first established the requirement for licensees to implement certain mitigation measures at existing power reactors for these beyond-design-basis events. This requirement was specifically intended to address "losses of large areas of a (reactor) plant due to fires and explosions." The Commission has since incorporated this requirement into the proposed rulemaking for 10 CFR 73.55 and Appendix C to 10 CFR part 73. Under the proposed 10 CFR part 73 rulemaking, future license applicants must identify and implement mitigative measures similar to those required for currently operating plants.

Most recently, the Commission published a final rule on March 19,

2007 (72 FR 12705), amending the DBT in 10 CFR 73.1. The DBT rule describes general attributes that nuclear power plant licensees must defend against with high assurance. This rulemaking enhanced the DBT by codifying generically applicable security requirements similar to those previously imposed by the Commission's April 29, 2003, DBT Orders.

On the basis of the previous information, the NRC concludes that existing power reactors pose no undue risk to public health and safety or common defense and security from the effects of an aircraft impact based on the Commission's specified aircraft characteristics. Therefore, the NRC is not applying the aircraft impact assessment requirement in this rulemaking to existing operating nuclear power plants.

## III. Currently Approved Standard Design Certifications

The Commission has concluded that the proposed rule need not be applied to the four currently approved standard design certifications in Appendices A through D to 10 CFR part 52.<sup>2</sup> Therefore, applicants would not need to recertify these standard designs to meet this proposed rule. This follows from the Commission's determination that the aircraft impact rule is an enhancement above and beyond what is necessary for adequate protection and that the aircraft impact scenario, as previously explained, is a beyond-design-basis event. Just as the currently operating power reactor facilities continue to meet adequate protection requirements and do not need to meet this new aircraft impact rule, so too are the already certified standard designs sufficient to meet adequate protection design requirements. Any reactor facility built to one of these already-certified designs will, of course, have to satisfy all adequate protection requirements applicable to operating power reactors.

The original applicant (or successor in interest of any of the four current standard design certifications) may voluntarily seek to amend the standard design certification to add design features, functional capabilities, or strategies in accordance with the requirements of proposed 10 CFR 52.500, "Aircraft Impact Assessment." The NRC encourages voluntary enhancement by the applicants for the four current standard design

certifications because it will increase the already high levels of safety and security provided by these reactor designs. Applicants may implement these design modifications in different ways, including:

- Applications to amend the existing design certifications.
- Application for a new design certification based on the existing certification, but containing the design features, functional capabilities, and strategies identified as a result of this rule.
- Requests submitted by combined license applicants for plant-specific departures from the standard design, where the departure implements the modifications developed by the original design certification applicant's voluntary implementation of the provisions of the proposed 10 CFR 52.500 (these requests may be submitted by each individual combined license applicant, or they may be submitted by a group of combined license applicants under the provisions of Appendix N, "Standardization of Nuclear Power Plant Designs: Combined Licenses to Construct and Operate Nuclear Power Reactors of Identical Design at Multiple Sites," to 10 CFR part 52 and subpart D, "Additional Procedures Applicable to Proceedings for the Issuance of Licenses to Construct and/or Operate Nuclear Power Plants of Identical Design at Multiple Sites," to 10 CFR part 2, "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders.")

## IV. Renewal of a Standard Design Certification, Combined License, or Manufacturing License

The NRC's proposed rulemaking does not require updating of the assessment of aircraft impacts required by proposed 10 CFR 52.500 as part of an application for either a renewed design certification under 10 CFR 52.57, "Application for Renewal," a renewed combined license under 10 CFR 52.107, "Application for Renewal," and 10 CFR part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," or a renewed manufacturing license under 10 CFR 52.177, "Application for Renewal." The NRC's requirement for assessment of large, commercial aircraft impacts is not an aging-related matter, nor is it based on time-limited considerations. Hence, aircraft impacts under the proposed rule are outside the scope of any combined license renewal proceeding under 10 CFR part 54 and combined license holders do not need to update the assessment required by 10 CFR 52.500(b) at the license renewal stage. Similarly, aircraft impacts under

<sup>2</sup> The four standard design certifications currently in effect are the U.S. Advanced Boiling Water Reactor (ABWR) design (Appendix A), the System 80+ design (Appendix B), the AP600 design (Appendix C), and the AP1000 design (Appendix D).

the proposed rule are outside the scope of any manufacturing license renewal proceeding under 10 CFR 52.177.

## V. Newly Designed Power Reactors

### A. Introduction

Under this proposed rule, relevant applicants for newly designed power reactors would be required to undertake the following:

- Perform an assessment of the effects on the designed facility of a beyond-design-basis aircraft impact
- Evaluate potential design features, functional capabilities, and strategies for avoiding or mitigating the effects of a beyond-design-basis aircraft impact on the key safety functions of the facility
- Describe how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions

The proposed rule is based on the premise that it is desirable for future power reactors to avoid or mitigate the effects of the applicable aircraft impact through design features that reduce or eliminate the need for operator actions. Because this type of consideration needs to occur during the development of the design itself, the NRC directs the requirements at plant designers.

The NRC does not expect plant designers to demonstrate that design features alone, without any operator action or mitigative response activity, will practicably avoid or mitigate the effects of the beyond-design-basis aircraft impact. The NRC recognizes that the decision to rely on design features (as opposed to operator action or mitigative strategies) is complex, and often involves a set of trade-offs between competing considerations. The NRC's goal is that the designer implement a rigorous assessment process to ensure that the design process constitutes a reasoned approach for assessing the plant design to identify practicable design or other features that either minimize the effects of, or mitigate, a beyond-design-basis aircraft impact.

### B. Description of Beyond-Design-Basis Aircraft Impact

Since September 11, 2001, the Commission has used state-of-the-art technology to assess the effects of aircraft impacts on nuclear power plants. As part of a comprehensive review of security for NRC-licensed facilities, the NRC conducted detailed, site-specific engineering studies of a limited number of nuclear power plants to assess potential vulnerabilities of

deliberate attacks involving large, commercial aircraft. In conducting these studies, the NRC consulted national experts from several Department of Energy laboratories using state-of-the-art structural and fire analyses. The agency also used realistic predictions of accident progression and radiological consequences.

The proposed rule sets forth a general description of the aircraft characteristics that are required to be used to perform the beyond-design-basis aircraft impact assessment. The assessment must be based on the Commission's specified aircraft characteristics used to define the beyond-design-basis impact of a large, commercial aircraft used for long distance flights in the United States, with aviation fuel loading typically used in such flights, and an impact speed and angle of impact considering the ability of both experienced and inexperienced pilots to control large, commercial aircraft at the low altitude representative of a nuclear power plant's low profile.

Beyond these general characteristics, the Commission will specify for plant designers in a Safeguards Information (SGI) guidance document more detailed characteristics of the large, commercial aircraft that should be used in the required assessment. Although the detailed aircraft characteristics will be described in an SGI guidance document and will not be publicly available because of their potential value to terrorists, the description of some of the factors used in selecting the parameters is offered to foster a better understanding of this rulemaking:

1. *The aircraft used by the terrorists on September 11, 2001.* The staff has reviewed the results of the September 11, 2001, attacks on the World Trade Center and the Pentagon. The NRC has used these reviews in previous studies for operating reactors. The NRC also used these reviews to make its decisions with respect to this rulemaking.

2. *Communications with other U.S. Government agencies.* Since September 11, 2001, the NRC has worked closely with the Department of Homeland Security, the Department of Defense, and other agencies both to understand their information on terrorist threats and to communicate the NRC's study results.

3. *Communications with foreign governments.* A number of foreign governments are considering the construction of new nuclear power plants. The NRC is communicating with the regulatory authorities in these countries to understand their requirements and to convey its own results and plans.

4. *Evaluations of commercial aircraft.* The NRC has studied the types, numbers, and characteristics of commercial aircraft flown in U.S. airspace.

Because this proposed rule is intended to provide added features to avoid or mitigate the effects of a beyond-design-basis event, the choice of aircraft characteristics and the scenario used for this analysis will not be linked to threat assessments or to any evolution of aircraft design. The proposed rule would require that the design-specific impact assessment use the Commission-specified aircraft characteristics as described in proposed 10 CFR 52.500(b). As stated previously, more specific details about the aircraft characteristics specified by the Commission will be contained in a separate guidance document under SGI controls. Because the guidance containing the more detailed aircraft characteristics will be SGI, the document will only be made available to those individuals with a need-to-know and who are otherwise qualified to have access to SGI. Plant designers (including their employees and agents) who meet the Commission's requirements for access to SGI would have access to the guidance document containing these more detailed characteristics in order to perform the assessments required by the proposed rule.

The Commission has carefully balanced the public interest in knowing the characteristics of the specific aircraft to be used in the aircraft impact assessment and the need for meaningful comment on specific details of the aircraft impact assessment. The result is an aircraft impact assessment proposed rule that describes the general aircraft characteristics which applicants are required to use in their aircraft impact assessments. The text of this proposed rule and the associated supplementary information, provide ample information to enable meaningful comment on what the aircraft impact assessment should entail. No additional information is necessary to understand or to comment on the proposed aircraft impact assessment rule. Members of the public can provide the Commission their views on this rulemaking regarding the design areas to be addressed in the assessment, functions to be evaluated for possible enhancement, and criteria for assessing practicability without having access to the more detailed SGI aircraft characteristics. Therefore, access to the proposed SGI aircraft characteristics contained in the regulatory guidance is not necessary to enable meaningful public comment on the proposed aircraft impact assessment rule.

This regulatory approach is similar to that used by the NRC in describing the DBT against which security programs under 10 CFR part 73 must defend. The general characteristics of the DBT appear in 10 CFR 73.1. More detailed information of a sensitive nature is contained in adversary characteristics documents. As is the case with the Commission's aircraft characteristics, the technical bases for these documents derive largely from intelligence information and contain SGI that must be withheld from public disclosure. They are available only on a need-to-know basis to those who are approved for access. In the final DBT rule, the NRC was careful to set forth rule text that does not compromise licensee security, but it also acknowledges the need to keep the public informed of the types of attacks against which nuclear power plants and Category I fuel cycle facilities are required to defend. The NRC is taking a similar approach in this proposed aircraft impact rule. This approach strikes the appropriate balance between public disclosure of the regulatory requirements governing nuclear power plants, and protection of public health and safety and common defense and security.

### C. Aircraft Impact Assessment

#### Technical Issues

Because the aircraft impact is a beyond-design-basis event, the methods and acceptance criteria used should be based on realistic assumptions. The aircraft impact assessment would include the items detailed in the following paragraphs:

1. *Consideration of aircraft characteristics.* The assessment must consider a large, commercial aircraft of the type currently in use for long distance flights in the United States as described previously in this document and in 10 CFR 52.500(b). More detailed characteristics of the large, commercial aircraft to be used in this assessment will be contained in a separate guidance document under SGI controls.

2. *Plant functions, structures, systems, components, and locations to be assessed.* The critical functions required to be evaluated in the aircraft impact assessment include core cooling, containment integrity, and spent fuel pool integrity. Evaluation of the survivability of these functions, should consider not only the key components, but also power supplies, cable runs, and other components that support these functions. The evaluation may take credit for the availability of both safety and non-safety equipment. The assessment should evaluate whether the

structures containing equipment that provides needed functions are likely to be affected by the specified large, commercial aircraft impact. Factors to be considered in the evaluation include the size and location of the structures and the presence of external impediments to impact.

3. *Damage mechanisms.* The assessment should model the structural response, shock and vibration effects, and fire effects of the postulated aircraft impact.

a. *Structural assessment.* The structural assessment should be based on a detailed structural model of the plant taking into account the nonlinear materials and geometric behavior. The assessment should consider both local and global (plant-wide) behavior, as well as thermal effects resulting from fire.

b. *Shock assessment.* The assessment should evaluate the local and global (plant-wide) shock and vibration effects resulting from the postulated impact.

c. *Fire assessment.* The fire assessment should consider the extent of structural damage and aviation fuel deposition, if any, and spread within the impacted buildings. The assessment should consider both short- and long-term fire effects.

#### Regulatory Treatment of the Assessment

The impact assessment is subject to audit and review by the NRC and, therefore, must be maintained by the applicant along with the rest of the information that forms the basis for the relevant application, consistent with paragraph (b) of 10 CFR 52.0, "Scope; Applicability of 10 CFR Chapter I Provisions," 10 CFR 50.70, "Inspections," and 10 CFR 50.71, "Maintenance of Records, Making of Reports." The applicant does not need to submit the impact assessment—as opposed to the "description and evaluation of the design features, functional capabilities, and strategies" required by proposed 10 CFR 52.500(c)—to the NRC in its application.

Under the proposed rule, the NRC will confirm that the impact assessment was performed consistent with the regulatory requirements and related guidance documents. The NRC may take appropriate enforcement action for any violations of applicable NRC requirements, including, but not limited to, proposed 10 CFR 52.500, 10 CFR 52.4, "Deliberate Misconduct," and 10 CFR 52.6, "Completeness and Accuracy of Information." A failure to perform the assessment would be a violation of the rule. The NRC expects the assessment to be rigorous. Any assessment that is inadequate to reasonably assess the

aircraft impact; to identify practicable design features, functional capabilities, or strategies; or to justify non-adoption of potentially advantageous design features, functional capabilities, or strategies, could be considered a violation of the rule.

The NRC's decision on an application subject to proposed 10 CFR 52.500 would be separate from any NRC determination that may be made with respect to the adequacy of the impact assessment which the rule does not require be submitted to the NRC. Applicants would only be required to submit a description and evaluation of the design features, functional capabilities, and strategies to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact in their final safety analysis report (FSAR) with the understanding that the complete aircraft impact assessment would be available for NRC audit and review at the applicant's offices, if needed. The NRC expects that, generally, the information that it needs to perform its review of the application to assess the applicant's compliance with 10 CFR 52.500 would be that information contained in the applicant's FSAR. Therefore, the adequacy of the impact assessment would not be a matter which may be the subject of a contention submitted as part of a petition to intervene under 10 CFR 2.309, "Hearing Requests, Petitions to Intervene, Requirements for Standing, and Contentions." A person who seeks NRC rulemaking action with respect to a proposed standard design certification on the basis that the impact assessment is inadequate could submit comments in the notice and comment phase of that rulemaking. A person who seeks rulemaking action after the NRC has adopted a final design certification rule on the basis that the impact assessment performed for that design certification is inadequate could submit a petition for rulemaking under 10 CFR 2.802, "Petition for Rulemaking," and 10 CFR 2.803, "Determination of Petition," seeking to amend the standard design certification. A person who seeks agency enforcement-related action on a combined license or manufacturing license on the basis of an inadequate impact assessment could file a petition under 10 CFR 2.206, "Requests for Action Under This Subpart."

Once the applicant completes the impact assessment, accomplishes the evaluation required by proposed 10 CFR 52.500(c) based on insights gained from the proposed 10 CFR 52.500(b) assessment, and includes the description and evaluation required by proposed 10 CFR 52.500(c) in the FSAR,

the purpose of the impact assessment would be achieved. Accordingly, the proposed rule would not require the impact assessment to be updated, by either: (1) The design certification applicant whose application references a design approval, (2) the design certification applicant following the NRC's adoption of a final standard design certification rule, (3) a design approval holder, (4) a manufacturing license applicant or holder whose application references a design certification or design approval, (5) a combined license applicant or holder whose application references a design certification, design approval, or manufactured reactor, or (6) a combined license holder whose application does not reference a design certification, design approval, or manufactured reactor and is required to prepare its own assessment.

The provisions of 10 CFR 50.71(c) require that records that are required by the regulations in 10 CFR part 50, "Domestic Licensing of Production and Utilization Facilities," or 10 CFR part 52 must be retained for the period specified by the appropriate regulation. If a retention period is not otherwise specified, the licensee must retain these records until the Commission terminates the facility license. Because proposed 10 CFR 52.500(b) would require the performance of the aircraft impact assessment, it falls under the category of "records that are required by the regulations" and therefore, the licensee would be required to retain the assessment until the Commission terminates the facility license. The NRC also expects to add specific provisions to each standard design certification rule for a design covered by proposed 10 CFR 52.500 governing retention of the aircraft impact assessment by both the applicant for the design certification (including an applicant after the Commission has adopted a final standard design certification rule) and a licensee who references that design certification. The NRC expects to require applicants and licensees to retain the assessment required by 10 CFR 52.500(b) throughout the pendency of the application and for the term of the certification or license (including any period of renewal). An example of such requirements can be found in any of the current design certification rules, Section X, "Records and Reporting," of Appendices A through D of 10 CFR part 52.

As discussed in Section VIII, "Specific Request for Comments," of this document, the NRC is requesting comments on whether, *in lieu* of the specific design certification rule

provisions or reliance on 10 CFR 50.71(c), it should adopt as part of the final 10 CFR 52.500 rulemaking a specific provision that would explicitly mandate the retention of the assessment. Such a provision, to be included in an additional paragraph of proposed 10 CFR 52.500, would also set forth the proposed period of retention for the assessment as the term of the design certification, combined license, or manufacturing license.

#### *D. Evaluation of Design Features, Functional Capabilities, and Strategies*

##### Technical Issues

The proposed rule would require designers of new facilities to describe how the design features, functional capabilities, and strategies adopted based on the insights of the aircraft impact assessment avoid or mitigate the effects of the aircraft impact. Plant structures critical to maintaining facility safety functions should be designed, if practicable, such that an impact does not result in structural failure, and aircraft parts and jet fuel do not enter the structures. In circumstances in which an impact results in aircraft parts and jet fuel entering structures or affecting equipment, plant structures and layouts should be evaluated with respect to maintaining key safety functions by addressing equipment survivability following the entry of aircraft parts and jet fuel and key safety functions are accomplished notwithstanding the resulting internal damage resulting from structural loads, shock and vibration, and fire.

As discussed previously, the Commission has issued orders to operating plants requiring mitigation of the effects of losing large areas of the plant from fires and explosions. These requirements include some reliance on operator actions, such as realigning systems to ensure continued core cooling following the loss of a large area. Because this proposed rule would apply to newly designed facilities before construction of the facility, the Commission expects that improvements can be made in the plant's design that have the same result as operator actions credited in operating plants. Thus, these designs should have reduced reliance, relative to current operating plants, on operator actions.

The proposed rule would require applicants to describe how the design features, functional capabilities, and strategies avoid or mitigate, "to the extent practicable," the effects of the applicable aircraft impact with reduced reliance on operator actions. The NRC intends this standard to include those

design features, functional capabilities, and strategies that are realistically and reasonably feasible from a technical engineering perspective. For example, the NRC believes it may be practicable to employ new technologies currently in use in the commercial nuclear power industry or in another industry. Alternatively, it would not be practicable to introduce a design feature that could have adverse safety or security consequences under a different operational or accident scenario. This consideration of practicability allows the designers to evaluate potential competing technical factors, such as the response to earthquakes, while at the same time addressing aircraft impacts.

Nuclear power plants are inherently very robust, secure structures designed to withstand tornadoes, hurricanes, earthquakes, floods, and other severe events. They have redundant and diverse safety equipment so that if an active component becomes unavailable, another component or system will satisfy its function. The results of the Commission's evaluation of postulated aircraft impacts on operating reactors reinforced the value of design features such as the following:

- Reinforced concrete walls
- Redundancy and spatial separation of key systems, structures and components
- Diversity of power supplies
- Compartmentalization of interior structures with pressure resisting concrete walls and doors

The NRC expects the required evaluation to consider the value of such design features and of possible improvements in these and other features. The applicant must base the evaluation on insights gained from the impact assessment performed under proposed 10 CFR 52.500(b).

##### Regulatory Treatment of the Evaluation

The NRC will confirm that the evaluation required by 10 CFR 52.500(c) was performed and that the FSAR includes the necessary description and evaluation of the design and other features adopted to avoid or mitigate, to the extent practicable, the potential effects of the applicable, beyond-design-basis aircraft impact. The NRC will review the evaluation contained in the application and reach a conclusion as to whether the applicant has conducted an evaluation reasonably formulated to identify practicable design and other features to avoid or mitigate the potential effects of the applicable, beyond-design-basis aircraft impact. However, NRC's review of the adequacy of the evaluation, and the effectiveness and practicability of the applicant-

selected features, capabilities, and strategies, are separate and distinct from the NRC's determination whether to issue a final standard design certification rule, a final design approval, a combined license, or a manufacturing license. Therefore, as is the case with the impact assessment, the NRC will use its established audit and review process to ensure the evaluation and determination of practicability was performed consistent with the regulatory requirements and related guidance documents. The NRC may take appropriate enforcement action for any violation of applicable NRC requirements. Inasmuch as the adequacy of the evaluation and the practicability of the applicant-selected features, capabilities, and strategies, are separate and distinct from the approval of the final design in the design certification, design approval, combined license, or manufacturing license, there would be no issue resolution associated with the assessment regarding the lack of effectiveness or practicability of potential design features, functional capabilities, and strategies not selected by the applicant for inclusion in the certified design.

The NRC is proposing that the design features, functional capabilities, or strategies credited for avoiding or mitigating the effects of an aircraft impact be described in Chapter 19 of the FSAR, which addresses severe accidents. The design features may include structures or features unchanged from the plant design as it existed before the aircraft impact assessment (e.g., an existing wall is found to be effective), structures or features included in the plant design but enhanced to improve the response to an aircraft impact (e.g., an existing wall is made stronger), or new structures or features added solely to address aircraft impacts (e.g., a new wall). The regulatory treatment of the design features (e.g., how changes to the features are controlled) depends on which of the above categories apply. For example, a design feature added specifically to avoid or mitigate the effects of an aircraft impact would be controlled only by requirements specifically for control of those design features added in this proposed rule or requirements that the NRC expects to add to future design certifications that would be subject to proposed 10 CFR 52.500. A safety-related structure credited in the aircraft impact assessment as a design feature would continue to be controlled by Appendix B to 10 CFR part 50, "Quality Assurance Criteria for Nuclear Power Plants and

Fuel Reprocessing Plants;" 10 CFR part 21, "Reporting of Defects and Noncompliance;" and other regulations establishing technical and administrative requirements on the non-aircraft impact functions, in addition to the proposed requirements for control of features to address aircraft impacts.

For combined licenses not referencing a certified design, the NRC is proposing to have change control governed by the requirements in a new 10 CFR 52.502, "Control of Changes to FSAR Information," to address changes to any design features, functional capabilities, or strategies credited for avoiding or mitigating the effects of an aircraft impact for a combined license that does not reference a certified design. Specifically, the proposed 10 CFR 52.502(c) would require that, if the licensee changes the information required by 10 CFR 52.79(a)(47) to be included in the FSAR, the licensee re-perform that portion of the evaluation required by proposed 10 CFR 52.500(c) that addresses the changed feature, capability, or strategy. The licensee would also be required to describe, in the re-evaluation, how the modified design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. Because this rule is being proposed to address a beyond-design-basis event, the NRC has determined that it is appropriate to apply the same standard to any licensee-proposed changes to features, capabilities, and strategies that would be applied during the original evaluation of those design features, functional capabilities, and strategies.

A combined license holder subject to proposed 10 CFR 52.500 (i.e., a licensee whose application does not reference a standard design certification, standard design approval, or manufactured reactor) may change the design features, functional capabilities, and strategies incorporated into the design, in accordance with proposed 10 CFR 52.502, without prior NRC review and approval, as long as the licensee re-performs that portion of the evaluation required by proposed 10 CFR 52.500(c) addressing the changed feature, capability, or strategy. The licensee must also describe, in the re-evaluation documented in a change to the FSAR, how the modified design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. Licensees' submittal of this updated information to the NRC

will be governed by the existing FSAR update requirements in 10 CFR 50.71(e).

A design feature, functional capability, or strategy described in a standard design certification may not be changed generically except by notice and comment rulemaking, see 10 CFR 52.63, "Finality of Standard Design Certifications," paragraphs (a)(1) and (2), and such a change must meet one of the criteria in 10 CFR 52.63(a)(1). All referencing combined licenses must implement any generic change to a design certification rule, as required by 10 CFR 52.63(a)(3).

The NRC expects to add a new change control provision to future design certification rules subject to proposed 10 CFR 52.500 to govern combined license holders referencing the design certification that request a departure from the design features, functional capabilities, or strategies in the referenced design certification. The new change control provision would require that, if the licensee changes the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the standard design certification, then the licensee must re-perform that portion of the evaluation required by proposed 10 CFR 52.500(c) addressing the changed feature, capability, or strategy. The licensee must also describe, in the re-evaluation documented in a change to the FSAR (i.e., a plant-specific departure from the generic design control document), how the modified design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. Licensees' submittal of this updated information to the NRC will be governed by the reporting requirements in the applicable design certification rule. The NRC expects to continue, in future standard design certification rulemakings, its practice of adopting reporting requirements analogous to Section X.B of the four existing standard design certification rules. Licensees making changes to design features, capabilities, or strategies included in the certified design or in the plant-specific FSAR may also need to develop alternate means to cope with the loss of large areas of the plant from explosions or fires to comply with the requirements in the proposed 10 CFR 73.55 and Appendix C to 10 CFR part 73.

A design feature, functional capability, or strategy described in a standard design approval may not be changed generically except under an application for a new design approval. There are no provisions in 10 CFR part 52 for making generic changes to a



standard design approval. Paragraph (a) of Section 52.145, "Finality of Standard Design Approvals; Information Requests," states that an approved design must be used by and relied upon by the NRC staff and the Advisory Committee on Reactor Safeguards in their review of any individual facility license application that incorporates by reference a standard design approval unless there exists significant new information that substantially affects the earlier determination or other good cause. Therefore, any changes to a design feature, functional capability, or strategy described in a standard design approval would be subject to review by the NRC in any application that references the design approval. Note that 10 CFR 52.131, "Scope of Subpart," states that the an applicant may submit standard designs for a nuclear power reactor or major portions thereof. To the extent that a standard design approval is issued for only portion of a nuclear power reactor, any applicant referencing that design approval will have to separately comply with the requirements of 10 CFR 52.500 for any portion of the design not addressed in the design approval issued by the NRC.

Under the provisions of 10 CFR 52.171, "Finality of Manufacturing Licenses; Information Requests," the holder of a manufacturing license may not make changes to the design features, functional capabilities, or strategies described in the FSAR without prior Commission approval. The request for a change to the design must be in the form of an application for a license amendment, and must meet the requirements of 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," and 10 CFR 50.92, "Issuance of Amendment."

Under the provisions of 10 CFR 52.171(b)(2), a combined license applicant or licensee who references or uses a nuclear power reactor manufactured under a manufacturing license under this subpart may request a departure from the design features, functional capabilities, or strategies described in the FSAR for the manufactured reactor. The Commission will grant such a request only if it determines that the departure will comply with the requirements of 10 CFR 52.7, "Specific Exemptions," and that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the departure.

Once the evaluation required by proposed 10 CFR 52.500(c) is completed and the application includes descriptions of the design features,

functional capabilities, and strategies, the purpose of the evaluation would be largely achieved. Thus, as with the assessment required by proposed 10 CFR 52.500(b), the applicant or licensee would not be required to update the paragraph (c) evaluation after the design certification, design approval, combined license, or manufacturing license is issued, or in an application for renewal under either 10 CFR 52.57, 10 CFR 52.107 and 10 CFR part 54, or 52.177. However, licensees would be required to maintain the paragraph (c) evaluation, inasmuch as proposed 10 CFR 52.79(a)(47) and 10 CFR 52.157(f)(32) require the proposed 10 CFR 52.500(c) evaluation and description to be included in the FSAR portion of the application.

Following issuance of a final design certification rule, the design certification applicant would not be required to update the evaluation so long as it does not request a significant change to any of the design features, functional capabilities, or strategies in the design certification. Similarly, the holder of a combined license or manufacturing license would not be required to update the evaluation so long as the licensee makes no significant change to the design features, functional capabilities, or strategies described in the FSAR.

As with the aircraft impact assessment required by proposed 10 CFR 52.500(b), in accordance with 10 CFR 50.71(c), each combined license holder and manufacturing license holder whose application was subject to proposed 10 CFR 52.500 would be required to retain the documentation supporting the proposed 10 CFR 52.500(c) evaluation for NRC review. With respect to a standard design certification, proposed 10 CFR 52.47(a)(28) would require the proposed 10 CFR 52.500(c) evaluation to be included in the FSAR submitted as part of the design certification application. The NRC acknowledges that the applicant for a standard design certification is not, per se, responsible for maintaining the FSAR information once a final design certification rule is adopted by the NRC. Nonetheless, the NRC continues to believe, for the reasons set forth in the statement of considerations for the first design certification rulemaking, see 62 FR 25800, May 19, 1997, at 25813–25814, 25826, that the original standard design certification applicant should be required to maintain the accuracy of the design certification information. Therefore, in future standard design certification rulemakings, the NRC expects to continue its practice of

adopting a records management requirement analogous to Section X.A of the four existing standard design certification rules. In addition to the information included in the FSAR for the design certification or combined license, the supporting documentation retained onsite should describe the methodology used in identifying and evaluating the practicability of potential features, capabilities, and strategies for inclusion in the design; and list the features, capabilities, and strategies that were considered but rejected, along with the basis for their rejection.

## VI. Section-by-Section Analysis

### *Section 52.11 Information Collection Requirements: OMB Approval*

Section 52.11 identifies the information collection requirements contained in 10 CFR part 52 approved by the Office of Management and Budget (OMB) as required by the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). The NRC is proposing to modify paragraph (b) to include proposed 10 CFR 52.500 in the list of requirements with approved information collections.

### *Section 52.47 Contents of Applications; Technical Information*

Section 52.47 identifies the required technical information to be included in an application for a standard design certification. The proposed rule would revise this section by adding a new paragraph (a)(28) requiring that the FSAR contain the information required by proposed 10 CFR 52.500, "Aircraft Impact Assessment." This information, as currently set forth in paragraph (c) of proposed 10 CFR 52.500, is limited to the following:

1. A description of the design features, functional capabilities, and strategies credited by the applicant to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact; and
2. An evaluation of how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

The 10 CFR 52.47(a)(28) requirement applies only to those standard design certification applications which are subject to proposed 10 CFR 52.500, that is, those design certifications issued after the effective date of the final rule (see 10 CFR 52.500(a)) that do not reference a design approval. Thus, any standard design certification application not referencing a standard design approval that is docketed and under

review by the NRC but has not yet been issued in final form as of the effective date of the final 10 CFR 52.500 must amend its application to include the information required by final 10 CFR 52.500.

*Section 52.79 Contents of Applications; Technical Information in Final Safety Analysis Report*

Section 52.79 identifies the required technical information to be included in an FSAR submitted in a combined license application under 10 CFR part 52, subpart C, "Combined Licenses." The proposed rule would revise this section by adding a new paragraph (a)(47) requiring that the FSAR contain the information required by proposed 10 CFR 52.500. This is the same type of information that an applicant for a standard design certification would need to submit, namely, the following:

1. A description of the design features, functional capabilities, and strategies credited by the applicant to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact; and

2. An evaluation of how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

Only those combined licenses issued after the effective date of the final rule that do not reference a standard design certification, standard design approval, or manufactured reactor would be subject to 10 CFR 52.79(a)(47). Thus, a combined license application filed after the effective date of the final 10 CFR 52.500 and referencing a standard design certification, standard design approval, or manufactured reactor would not have to include the information required by 10 CFR 52.500. The NRC notes that this would be true even for a combined license application which references one of the four current standard design certifications (ABWR, 10 CFR part 52, Appendix A; System 80+, 10 CFR part 52, Appendix B; AP600, 10 CFR part 52, Appendix C; and AP1000, 10 CFR part 52, Appendix D). This is consistent with the requirements of 10 CFR 52.79(c), (d), and (e) which state that, if the combined license application references a standard design certification, standard design approval, or manufactured reactor, then the FSAR need not contain information or analyses submitted to the Commission in connection with the design certification, design approval, or manufacturing license, as applicable. By contrast, a combined license applicant not referencing a standard design

certification, standard design approval, or manufactured reactor whose application is docketed and under review by the NRC but for which a license has not yet been issued as of the effective date of the final 10 CFR 52.500, must amend its application to include the information required by 10 CFR 52.500.

*Section 52.137 Contents of Applications; Technical Information*

Section 52.137 identifies the required technical information to be included in an application for a standard design approval. The proposed rule would revise this section by adding a new paragraph (a)(26) requiring that the FSAR contain the information required by proposed 10 CFR 52.500. This information, as currently set forth in paragraph (c) of proposed 10 CFR 52.500, is limited to the following:

1. A description of the design features, functional capabilities, and strategies credited by the applicant to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact; and

2. An evaluation of how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

The 10 CFR 52.137(a)(26) requirement applies only to those standard design approval applications which are subject to proposed 10 CFR 52.500, that is, those design approvals issued after the effective date of the final rule (see 10 CFR 52.500(a)). Thus, any standard design approval application that is docketed and under review by the NRC but has not yet been issued in final form as of the effective date of the final 10 CFR 52.500 must amend its application to include the information required by final 10 CFR 52.500.

*Section 52.157 Contents of Applications; Technical Information in Final Safety Analysis Report*

Section 52.157 identifies the required technical information to be included in an application for a manufacturing license. The proposed rule would revise this section by adding a new paragraph (f)(32) requiring that the FSAR contain the information required by proposed 10 CFR 52.500. This information, as currently set forth in paragraph (c) of proposed 10 CFR 52.500, is limited to the following:

1. A description of the design features, functional capabilities, and strategies credited by the applicant to avoid or mitigate the effects of the

applicable, beyond-design-basis aircraft impact; and

2. An evaluation of how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

The 10 CFR 52.157(f)(32) requirement applies only to those manufacturing license applications which are subject to proposed 10 CFR 52.500, that is, those manufacturing licenses issued after the effective date of the final rule that do not reference a design certification or design approval (see 10 CFR 52.500(a)). Thus, any manufacturing license application that is docketed and under review by the NRC but has not yet been issued in final form as of the effective date of the final 10 CFR 52.500 must amend its application to include the information required by final 10 CFR 52.500.

*Section 52.303 Criminal Penalties*

Section 52.303 identifies the regulations in 10 CFR part 52 that are not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 of the Atomic Energy Act of 1954, as amended, which provides for criminal sanctions for willful violation of, attempted violation of, or conspiracy to violate, any regulation issued under Sections 161b, 161i, or 161o of the Act. The NRC is proposing to modify paragraph (b) to include proposed 10 CFR 52.500 and proposed 10 CFR 52.502 in the list of regulations not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 of the Act.

*Subpart K—Additional Requirements*

The NRC proposes to add a new subpart K, "Additional Requirements," to 10 CFR part 52. This subpart would be reserved for requirements applicable only to the licenses, certifications, and approvals under 10 CFR part 52 that have unique characteristics which mitigate against placing them in other parts of 10 CFR Chapter I, "Nuclear Regulatory Commission" of Title 10.

*Section 52.500 Aircraft Impact Assessment*

Proposed 10 CFR 52.500 would be a new requirement for assessing a large, commercial aircraft impact at nuclear power plants and incorporating design features, functional capabilities, and strategies to avoid or mitigate, to the extent practicable, the effects of such aircraft impacts.

Paragraph (a) would state that the requirements of this section would be applicable to all standard design

certifications issued after the effective date of the final rule that do not reference a standard design approval; standard design approvals issued after the effective date of the final rule; combined licenses issued after the effective date of the final rule that do not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing licenses issued after the effective date of the final rule that do not reference a standard design certification or standard design approval. A design certification rule issued after the effective date of the final 10 CFR 52.500 rule that does not reference a design approval is subject to the requirements of the rule even if its application was filed before the effective date of the final 10 CFR 52.500 rule. Similarly, a design approval issued after the effective date of the final rule is subject to the requirements of the rule even if its application was filed before the effective date of the final rule. A combined license issued after the effective date of the final 10 CFR 52.500 rule that does not reference a design certification, design approval, or manufactured reactor would be subject to the requirements of the rule, even if its application was filed before the effective date of the final 10 CFR 52.500 rule. As noted earlier in the section-by-section discussion of proposed 10 CFR 52.79(a)(47) of this document, a combined license issued after the effective date of the final 10 CFR 52.500 rule referencing one of the four current standard design certifications, would not be subject to the requirements of proposed 10 CFR 52.500.

Paragraph (b) would require those applicants subject to proposed 10 CFR 52.500 to perform a design-specific assessment of the effects on the designed facility of the impact of a large, commercial aircraft (impact assessment). By "design-specific," the NRC means that the impact assessment must address the specific design which is either the subject of the standard design certification, standard design approval, combined license, or manufacturing license application. The proposed rule would require that the design-specific impact assessment be based on Commission-specified general aircraft characteristics used to define the beyond-design-basis impact of a large, commercial aircraft used for long distance flights in the United States, with aviation fuel loading typically used in such flights, and an impact speed and angle of impact considering the ability of both experienced and inexperienced pilots to control large, commercial

aircraft at the low altitude representative of a nuclear power plant's low profile. Beyond these general characteristics, the Commission will specify for plant designers in an SGI guidance document more detailed characteristics of the large, commercial aircraft to be used in the required assessment. This approach is discussed in more detail in Section V.B of the Supplementary Information of this document. Because the assessment of an aircraft impact is a beyond-design-basis event, the methods and acceptance criteria used in the assessment should be based on realistic assumptions.

Paragraph (c) would require the relevant applications to include a description and evaluation of the design features, functional capabilities, and strategies (features, capabilities, and strategies) to avoid or mitigate the effects of the aircraft impact that applicants must assess under paragraph (b). Design features, functional capabilities, and strategies could include such things as reinforced concrete walls (in the original design, modified, or added); redundancy and spatial separation of key systems, structures and components; diversity of power supplies; and compartmentalization of interior structures. The NRC expects the required assessment to include an evaluation of such features, capabilities, and strategies and of possible improvements in them. The evaluation of such design features, functional capabilities, and strategies must include core cooling capability, containment integrity, and spent fuel pool integrity.

The description of the features, capabilities, and strategies should be equivalent in detail to descriptions of other design features and functional capabilities addressing beyond-design-basis events or severe accidents which are required to be described in the design certification, design approval, combined license, or manufacturing license FSAR. However, the NRC reiterates that the aircraft impact at which these features, capabilities, and strategies are directed is not a design basis event. Therefore, these features, capabilities, and strategies need not meet the "special treatment" requirements<sup>3</sup> applicable to safety-related or important to safety structures, systems, and components.

The paragraph (c) evaluation should be a structured process which would

<sup>3</sup> See 10 CFR 50.69(b)(1)(I) through (xi) for a list of NRC's "special treatment" requirements for light water power reactors, which would not be applicable to the design features, functional capabilities, and strategies selected by the applicant in accordance with proposed 10 CFR 52.500.

require consideration of the insights gained by the impact assessment performed under proposed 10 CFR 52.500(b) and identify features, capabilities, and strategies which are practicable to include in the facility design. The evaluation should summarize the bases for the applicant's determination that the selected features, capabilities, and strategies incorporated into the facility design avoid or mitigate, to the extent practicable, the effects of the applicable, beyond-design-basis aircraft impact, with reduced reliance on operator actions. As with the impact assessment, the evaluation would address a beyond-design-basis event, and therefore, need not be performed in accordance with the NRC's "special treatment" requirements, such as the quality assurance/quality control requirements in Appendix B of 10 CFR part 50. The proposed 10 CFR 52.500(c) evaluation must be included in the FSAR in accordance with 10 CFR 52.47(a)(28), 10 CFR 52.79(a)(47), 10 CFR 52.137(a)(26), or 10 CFR 52.157(f)(32) and should address only those features, capabilities, and strategies selected by the applicant for inclusion in the plant design. In addition to describing and evaluating the incorporated design and other features, the application must describe how such design and other features, avoid or mitigate, to the extent practicable, the effects of the impact with reduced reliance on operator actions. The NRC intends this standard to include those design features, functional capabilities, and strategies which are realistically and reasonably feasible from a technical engineering perspective. For example, the NRC believes that it may be practicable to employ existing technologies currently in use in the commercial nuclear power industry or in another industry. However, it would not be practicable to introduce a design feature that could have adverse safety or security consequences under a different operational or accident scenario.

Inclusion of any SGI in the evaluation submitted in the FSAR as part of a relevant application must be in accordance with applicable requirements in 10 CFR part 73. The NRC will process and address requests for access to this information from the general public in accordance with the NRC's existing procedures.

#### *Section 52.502 Control of Changes to FSAR Information*

Paragraph (a) would state that, for standard design certifications which are subject to proposed 10 CFR 52.500, generic changes to the information

required by 10 CFR 52.47(a)(28) to be included in the FSAR are governed by the applicable requirements of 10 CFR 52.63. A design feature, functional capability, or strategy described in a standard design certification may not be changed in the design certification except by notice and comment rulemaking, see 10 CFR 52.63(a)(1) and (2), and such a change must meet one of the criteria in 10 CFR 52.63(a)(1). Any generic change to a design certification rule must be implemented by all referencing combined licenses, as required by 10 CFR 52.63(a)(3).

Paragraph (b) would state that, for combined license applicants or holders which are not subject to proposed 10 CFR 52.500 but reference a standard design certification which is subject to proposed 10 CFR 52.500, proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the standard design certification are governed by the change control requirements in the applicable design certification rule. A combined license holder referencing a standard design certification subject to proposed 10 CFR 52.500 (i.e., a design certification issued after the effective date of the final 10 CFR 52.500), who seeks to depart from the design features, functional capabilities, or strategies in the referenced design certification, would be governed by a new change control provision that the NRC expects to add to future design certification rules to which proposed 10 CFR 52.500 would apply. The new change control provision would require that, if the licensee changes the information required by proposed 10 CFR 52.47(a)(28) to be included in the FSAR for the standard design certification, then the licensee shall re-perform that portion of the evaluation required by proposed 10 CFR 52.500(c) addressing the changed feature, capability, or strategy, and describe, in the re-evaluation, how the remaining design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

Paragraph (c) would state that, for combined licenses which are subject to proposed 10 CFR 52.500, if the licensee changes the information required by 10 CFR 52.79(a)(47) to be included in the FSAR, then the licensee shall re-perform that portion of the evaluation required by 10 CFR 52.500(c) addressing the changed feature, capability, or strategy, and describe, in the re-evaluation, how the modified design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the

effects of the applicable aircraft impact with reduced reliance on operator actions. The NRC believes that, because this rule is being proposed to address a beyond-design-basis event, it is appropriate to apply the same standard that was applied during the original evaluation of design features, functional capabilities, and strategies to any licensee-proposed changes to such features, capabilities, and strategies.

Paragraph (d) would state that, for manufacturing licenses which are subject to 10 CFR 52.500, generic changes to the information required by 10 CFR 52.157(f)(32) to be included in the final safety analysis report are governed by the applicable requirements of 10 CFR 52.171. Paragraph (b)(1) of 10 CFR 52.171 does not allow the holder of a manufacturing license to make changes to the design of the nuclear power reactor authorized to be manufactured without prior Commission approval. Any request for a change to the design must be in the form of an application for a license amendment, and must meet the requirements of 10 CFR 50.90 and 10 CFR 50.92.

Paragraph (e) would state that, for combined license applicants or holders which are not subject to 10 CFR 52.500 but reference a manufactured reactor which is subject to 10 CFR 52.500, proposed departures from the information required by 10 CFR 52.157(f)(32) to be included in the FSAR for the manufacturing license are governed by the applicable requirements in 10 CFR 52.171(b)(2). Paragraph (b)(2) of 10 CFR 52.171 allows an applicant or licensee who references or uses a nuclear power reactor manufactured under a manufacturing license under this subpart to request a departure from the design characteristics, site parameters, terms and conditions, or approved design of the manufactured reactor. The Commission may grant a request only if it determines that the departure will comply with the requirements of 10 CFR 52.7, and that the special circumstances outweigh any decrease in safety that may result from the reduction in standardization caused by the departure.

#### VII. Guidance

The NRC staff is preparing new regulatory guidance on the requirements in proposed 10 CFR 52.500. This guidance is intended to provide an acceptable method by which relevant applicants can perform the assessment of aircraft impacts to meet the requirements of proposed 10 CFR 52.500. The proposed rule would

require that the design-specific impact assessment use the Commission-specified general aircraft characteristics. A more detailed description of the aircraft characteristics that should be used in the assessment will be set forth in the regulatory guidance, which will be issued in draft form following publication of this proposed rule. Because the portion of this regulatory guidance describing the detailed aircraft characteristics is likely to contain SGI, that portion of the document will only be made available to those individuals with a need-to-know, and who are otherwise qualified to have access to SGI. A version of the document without the SGI would be made publicly available. Final publication of the regulatory guidance is planned to coincide with publication of the final rule. The Commission reiterates, however, that the commenters on this proposed rule need not await the publication of the draft guidance in order to be able to comment on the proposed rule, in as much as the rule and the supplementary information in this document are sufficient to comment on the substance of the proposed rule.

#### VIII. Specific Request for Comments

In addition to the general invitation to submit comments on the proposed rule, the NRC also requests comments on the following questions:

1. *Inclusion of impact assessment in application.* The proposed rule does not require that the assessment of aircraft impacts that would be mandated by proposed 10 CFR 52.500(b) be included in the FSAR or otherwise submitted as part of the application for a standard design certification, standard design approval, combined license, or manufacturing license. However, the NRC is proposing that a description of the design features, functional capabilities, and strategies credited by the applicant to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact be included in the FSAR submitted with the relevant application. In addition, the FSAR must contain an evaluation of how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. The NRC is seeking specific comments on the desirability, or lack thereof, of requiring, in the final rule, that applicants include the aircraft impact assessment required by proposed 10 CFR 52.500(b) in the FSAR or another part of the application.

2. *Acceptance criteria.* The acceptance criterion contained in proposed 10 CFR 52.500 by which the

NRC may judge the required assessment and evaluation is the practicability criterion addressed in paragraph (c), that is, that the applicant must describe how the “design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.” The NRC is considering adding an additional acceptance criterion to proposed 10 CFR 52.500 for judging the acceptability of the applicant’s aircraft impact assessment and evaluation. The NRC is seeking specific comments on the desirability, or lack thereof, of adding an additional acceptance criterion in the final rule beyond the proposed rule’s practicability criterion. Such an additional acceptance criterion could read, for example:

The application must also describe how such design features, functional capabilities, and strategies will provide reasonable assurance that any release of radioactive materials to the environment will not produce public exposures exceeding 10 CFR part 100 guidelines.

3. *Records retention.* The proposed rule relies on the general record retention requirements in 10 CFR 50.71(c) for retention of the assessment required by proposed 10 CFR 52.500 for combined license and manufacturing license applicants subject to proposed 10 CFR 52.500. The NRC intends to similarly rely on a general design certification rule provisions for retention of the assessment required by proposed 10 CFR 52.500 for design certification applicants and combined license and manufacturing license holders that reference a design certification. The NRC is requesting specific comments on whether, in lieu of the specific design certification rule provisions or reliance on 10 CFR 50.71(c), the NRC should adopt as part of the final 10 CFR 52.500 rulemaking a specific provision that would explicitly mandate the retention of the assessment. Such a provision, would be included in an additional paragraph of final 10 CFR 52.500, and would set forth the proposed period of retention. Inclusion of a generic records retention requirement in final 10 CFR 52.500 would preclude the need for the NRC to include a specific records retention provision in each standard design certification subject to final 10 CFR 52.500. The NRC requests comments on whether such a provision should be included in final 10 CFR 52.500, together with specific reasons in support of the commenter’s position.

The NRC also requests comments on the appropriate period for retention of the assessment, evaluation, and supporting documentation. The NRC is considering the following alternatives:

- For a standard design certification, combined license, and manufacturing license the period of NRC review prior to NRC final action on the application.
- For a standard design certification and manufacturing license, the duration of the design certification or manufacturing license (i.e., the period during which the design certification or manufactured reactor may be referenced, including any renewal).
- For a standard design certification or manufacturing license, until the licensee of the final referencing license has submitted a certification under 10 CFR 50.82(a), or the final referencing license has been terminated.
- For a combined license, when the licensee has submitted a certification under 10 CFR 50.82(a), or the combined license has been terminated.

4. *Requests to amend existing standard design certifications to address aircraft impacts.* The NRC has concluded that it does not need to apply the proposed rule to the four currently approved standard design certifications, as discussed in detail in Section III of the Supplementary Information of this document. Nonetheless, the original applicant (or successor in interest of any of the four current standard design certifications) may request an amendment to the standard design certification to add design features, functional capabilities, or strategies in accordance with the requirements of 10 CFR 52.500. The NRC encourages such requests for amendment by the applicants for the four current standard design certifications because it will further enhance the already high levels of safety and security provided by these reactor designs. These design modifications may be implemented in different ways as described in Section III of the Supplementary Information of this document. However, under the proposed rule, there are no standards, other than those contained in 10 CFR 52.63(a), for judging changes to the design to address the effects of an aircraft impact. The NRC requests specific comments on whether it should use the same criterion to judge amendments to an existing design certification as it would use on a new design certification applicant under the proposed 10 CFR 52.500.

5. *Applicability to future 10 CFR part 50 license applicants.* The NRC is proposing to apply the requirements in proposed 10 CFR 52.500 to 10 CFR part 52 applicants only, specifically, to

applicants for standard design certifications issued after the effective date of the final rule that do not reference a standard design approval; standard design approvals issued after the effective date of the final rule; combined licenses issued after the effective date of the final rule that do not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing licenses issued after the effective date of the final rule that do not reference a standard design certification or standard design approval. However, the NRC is considering extending the applicability of the proposed 10 CFR 52.500 requirements to future applicants for construction permits under 10 CFR part 50. The NRC requests specific comments on the desirability, or lack thereof, of extending, to future 10 CFR part 50 construction permit applicants, the applicability of the proposed requirements to perform an aircraft impact assessment and to evaluate the design features, functional capabilities, and strategies to avoid or mitigate, to the extent practicable, the effects of the applicable, beyond-design-basis aircraft impact.

6. *Addition of technical requirements to 10 CFR part 52.* In the recent revision to 10 CFR part 52, the NRC took a comprehensive approach to reorganizing 10 CFR part 52 and making conforming changes throughout 10 CFR Chapter I, “Nuclear Regulatory Commission,” to reflect the licensing and approval processes in 10 CFR part 52. In that rulemaking, the NRC reviewed the existing regulations in 10 CFR Chapter I to determine if the existing regulations needed to be modified to reflect the licensing and approval processes in 10 CFR part 52. In making conforming changes involving 10 CFR part 50 provisions, the NRC adopted the general principle of keeping the technical requirements in 10 CFR part 50 and maintaining all applicable procedural requirements in 10 CFR part 52. This proposed aircraft impact rule represents a departure from that general principle in that it proposes to include specific technical requirements in 10 CFR part 52 and would create a separate subpart for inclusion of future, similar, technical requirements. The NRC is considering relocating the proposed aircraft impact requirements from 10 CFR 52.500 to a new section in 10 CFR part 50 in order to maintain the general principle it established in the comprehensive 10 CFR part 52 rulemaking. The NRC requests specific comments on the desirability, or lack

thereof, of relocating the proposed aircraft impact requirements from 10 CFR 52.500 to a new section in 10 CFR part 50.

7. *Applicability to design approvals and manufacturing licenses.* The proposed rule would apply to future design approvals or manufacturing licenses. In the recent comprehensive rulemaking on 10 CFR part 52, the NRC strived for a high level of consistency in the requirements for design certifications, design approvals, and manufacturing licenses, given the similarity in the regulatory functions of these three processes. However, it is not clear that there will be future design approval applications, in light of the NRC's recent determination to remove the design approval as a prerequisite for obtaining a design certification. Similarly, there does not appear to be any near-term interest in obtaining a manufacturing license for the manufacture of a nuclear power plant. Therefore, the NRC is considering eliminating the applicability of the proposed 10 CFR 52.500 requirements to future applicants for design approvals and manufacturing licenses. The NRC requests specific comments on the desirability, or lack thereof, of eliminating the applicability of the proposed 10 CFR 52.500 requirements to future applicants for design approvals and manufacturing licenses.

8. *Scope of design evaluated.* The proposed 10 CFR 52.500 would be applicable to all standard design certifications, standard design approvals, and manufacturing licenses issued after the effective date of the final rule and to all combined licenses issued after the effective date of the final rule that do not reference a standard design certification, standard design approval, or manufacturing license. However, the proposed rule does not address the difference in the scope of the facility

design that would be considered by an applicant for a standard design certification, standard design approval, or manufacturing license and the scope of the design that would be considered by a combined license applicant. For a standard design certification, standard design approval, or manufacturing license, the applicant is required to address only a subset of the facility design that a combined license applicant is required to address. In general, a design certification, design approval, or manufacturing license applicant is required to address such items as the reactor core, reactor coolant system, instrumentation and control systems, electrical systems, containment system, other engineered safety features, auxiliary and emergency systems, power conversion systems, radioactive waste handling systems, and fuel handling systems. In contrast, a combined license applicant also must address site-specific design features, such as the ultimate heat sink. Combined license applicants that do not reference a design certification, design approval, or manufactured reactor could address such site-specific design features in their evaluation of design features, functional capabilities, and strategies to avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. However, the proposed rule does not impose any requirements on a combined license applicant that references a design certification, design approval, or manufactured reactor with regard to addressing the potential effects of an aircraft impact on such site-specific portions of the design. The proposed rule could, therefore, introduce an inconsistency in the treatment of combined license applicants that reference a design certification, design approval, or manufactured reactor and combined

license applicants that submit a custom design. Therefore, to ensure consistent treatment of all combined license applicants, the NRC is considering an alternative approach in the final rule. One approach that the NRC is considering is to adopt additional requirements for combined license applicants that reference a design certification, design approval, or manufactured reactor that would require such applicants to evaluate that portion of the design excluded from the design certification, design approval, or manufactured reactor for additional design features, functional capabilities, or strategies to avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions. Alternatively, the NRC is considering limiting the scope of the evaluation for combined license applicants not referencing a design certification, design approval, or manufactured reactor to that portion of the design that would otherwise be covered in a design certification, design approval, or manufacturing license application, which would include the majority of the facility considered most vulnerable to an aircraft impact. The NRC requests specific comments on the desirability, or lack thereof, of adopting one of these alternative approaches in the final rule.

**IX. Availability of Documents**

The NRC is making the documents identified below available to interested persons through one or more of the following methods as indicated.

*Public Document Room (PDR).* The NRC Public Document Room is located at 11555 Rockville Pike, Rockville, Maryland 20852.

*NRC's Electronic Reading Room (ERR).* The NRC's public electronic reading room is located at <http://www.nrc.gov/reading-rm.html>.

Document	PDR	Web	ERR (ADAMS)
Environmental Assessment .....	X	X	ML072200262
SRM-SECY-06-0204 (April 24, 2007) .....	X	X	ML071140119
SECY-06-0204, "Proposed Rulemaking—Security Assessment Requirements for New Nuclear Power Reactor Designs" (September 26, 2006).	X	X	ML062300068
NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook" (January 1997) .....	X	.....	ML050190193
NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4 (September 2004).	X	X	ML042820192

**X. Plain Language**

The Presidential memorandum "Plain Language in Government Writing" published June 10, 1998 (63 FR 31883) directed that the Government's documents be in clear and accessible language. The NRC requests comments

on the proposed rule specifically with respect to the clarity and effectiveness of the language used. Comments should be sent to the NRC as explained in the **ADDRESSES** caption of this notice.

**XI. Agreement State Compatibility**

Under the "Policy Statement on Adequacy and Compatibility of Agreement States Programs," approved by the Commission on June 20, 1997, and published in the **Federal Register** (62 FR 46517; September 3, 1997), this

rule is classified as compatibility "NRC." Compatibility is not required for Category "NRC" regulations. The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act or the provisions of 10 CFR. Although an Agreement State may not adopt program elements reserved to the NRC, it may wish to inform its licensees of certain requirements via a mechanism that is consistent with the particular State's administrative procedure laws. Category "NRC" regulations do not confer regulatory authority on the State.

## XII. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Pub. L. 104-113, requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless using such a standard is inconsistent with applicable law or is otherwise impractical. The NRC is not aware of any voluntary consensus standard that could be used instead of the proposed Government-unique standards. The NRC will consider using a voluntary consensus standard if an appropriate standard is identified.

## XIII. Finding of No Significant Environmental Impact: Availability

The NRC has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in subpart A to 10 CFR part 51, that this rule, if adopted, would not be a major Federal action significantly affecting the quality of the human environment and, therefore, an environmental impact statement is not required.

The determination of this environmental assessment is that there will be no significant offsite impact to the public from this action. However, the general public should note that the NRC is seeking public participation; availability of the environmental assessment is provided in Section IX of this document. Comments on any aspect of the environmental assessment may be submitted to the NRC as indicated under the **ADDRESSES** heading.

The NRC has sent a copy of the environmental assessment and this proposed rule to every State Liaison Officer and requested their comments on the environmental assessment.

## XIV. Paperwork Reduction Act Statement

This proposed rule contains new or amended information collection requirements that are subject to the

Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*). This rule has been submitted to the Office of Management and Budget for review and approval of the information collection requirements.

*Type of submission, new or revision:* Revision.

*The title of the information collection:* 10 CFR part 52; "Consideration of Aircraft Impacts for New Nuclear Power Reactor Designs," proposed rule.

*The form number if applicable:* N/A.

*How often the collection is required:* One time; to be submitted with each application for a design certification not referencing a design approval, a design approval, a combined license not referencing a design certification, design approval, or manufactured reactor; or a manufacturing license not referencing a design certification or design approval.

*Who will be required or asked to report:* Designers and any person eligible under the Atomic Energy Act to apply for a design certification, design approval, combined license, or manufacturing license for a nuclear power plant.

*An estimate of the number of annual responses:* 1.

*The estimated number of annual respondents:* 1.

*An estimate of the total number of hours needed annually to complete the requirement or request:* 3,960 hours.

*Abstract:* The U.S. Nuclear Regulatory Commission (NRC) is proposing to amend its regulations to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, the applicant shall include in its application a description and evaluation of design features, functional capabilities, and strategies to avoid or mitigate the effects of the aircraft impact. The evaluation of such design features, functional capabilities, and strategies must include core cooling capability, containment integrity, and spent fuel pool integrity. The impact of a large, commercial aircraft is a beyond-design-basis event, and the NRC's requirements applicable to the design, construction, testing, operation, and maintenance of design features, functional capabilities, and strategies for design basis events would not be

applicable to design features, functional capabilities, or strategies selected by the applicant solely to meet the requirements of this rule. The objective of this rule is to require nuclear power plant designers to perform a rigorous assessment of design features that could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

The U.S. Nuclear Regulatory Commission is seeking public comment on the potential impact of the information collections contained in the proposed rule and on the following issues:

1. Is the proposed information collection necessary for the proper performance of the functions of the NRC, including whether the information will have practical utility?
2. Is the estimate of burden accurate?
3. Is there a way to enhance the quality, utility, and clarity of the information to be collected?
4. How can the burden of the information collection be minimized, including the use of automated collection techniques?

A copy of the OMB clearance package may be viewed free of charge at the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Room O-1 F21, Rockville, MD 20852. The OMB clearance package and rule are available at the NRC worldwide Web site: <http://www.nrc.gov/public-involve/doc-comment/omb/index.html> for 60 days after the signature date of this document.

Send comments on any aspect of these proposed information collections, including suggestions for reducing the burden and on the above issues, by November 2, 2007 to the Records and FOIA/Privacy Services Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to [INFOCOLLECTS@NRC.GOV](mailto:INFOCOLLECTS@NRC.GOV) and to the Desk Officer, Nathan Frey, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0151), Office of Management and Budget, Washington, DC 20503. Comments received after this date will be considered if it is practical to do so, but assurance of consideration cannot be given to comments received after this date. You may also e-mail comments to [Nathan\\_J.\\_Frey@omb.eop.gov](mailto:Nathan_J._Frey@omb.eop.gov) or comment by telephone at 202-395-4650.

### Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond

to, a request for information or an information collection requirement unless the requesting document displays a currently valid OMB control number.

## XV. Regulatory Analysis

The NRC has prepared a regulatory analysis on this proposed rule and has included it in this **Federal Register** document. The analysis examines the costs and benefits of the alternatives considered by the NRC.

### 1. Statement of the Problem and Objective

This proposed rule would amend 10 CFR part 52 to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, the applicant would need to include in its application a description and evaluation of design features, functional capabilities, and strategies to avoid or mitigate the effects of the aircraft impact. The objective of this rule is to require nuclear power plant designers to perform a rigorous assessment of design features that could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

### 2. Identification of Regulatory Alternatives

The only alternative considered was to conduct a rulemaking to require applicants to perform an aircraft impact assessment on newly designed facilities because the Commission directed the NRC staff in a staff requirements memorandum dated April 24, 2007, to so revise the regulations. However, the NRC staff considers the no-action alternative as the baseline from which to measure the costs and benefits of the proposed rule.

The regulations in 10 CFR part 52 would be amended to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new

manufacturing licenses that do not reference a standard design certification or standard design approval, and those applicants with applications pending on the effective date of this rule, (relevant applicants) to perform an aircraft impact assessment of the effects on the designed facility of the impact of a large, commercial aircraft. Based on the insights derived from this assessment, the application would need to include a description and evaluation of the design features, functional capabilities, and strategies to avoid or mitigate the effects of an aircraft impact, addressing core cooling capability, containment integrity, and spent fuel pool integrity. The applicant would need to describe how such design and other features avoid or mitigate, to the extent practicable, the aircraft impact effects with reduced reliance on operator actions. The proposed rule would result in newly designed power reactor facilities being more inherently robust with regard to a potential aircraft impact than if they were designed in the absence of this rule.

### 3. Analysis of Values and Impacts of Proposed Rulemaking

#### 3.1 Identification of Affected Attributes

The NRC identified the attributes that the proposed regulatory action could affect by using the list of potential attributes provided in Chapter 5 of NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook," issued January 1997. Affected attributes include the following:

**Public Health (Accident).** The proposed regulatory action would reduce the risk that public health will be affected by the release of radioactive materials to the environment from the impact of a large, commercial aircraft on a nuclear power plant.

**Occupational Health (Accident).** The proposed regulatory action would reduce the risk that occupational health will be affected by the release of radioactive materials to the environment from the impact of a large, commercial aircraft on a nuclear power plant.

**Offsite Property.** The proposed regulatory action would reduce the risk that offsite property will be affected by the release of radioactive materials to the environment from the impact of a large, commercial aircraft on a nuclear power plant.

**Onsite Property.** The proposed regulatory action would reduce the risk that onsite property will be affected by the release of radioactive materials to the environment from the impact of a

large, commercial aircraft on a nuclear power plant.

**Industry Implementation.** The proposed regulatory action would require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, the applicant would need to include in its application a description and evaluation of design features, functional capabilities, and strategies to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

**NRC Implementation.** Under the proposed regulatory action, the NRC would incur costs to develop guidance on performing an aircraft impact assessment, to review the actions taken by the applicant based on the insights gained from the assessment, and to review the assessment if the NRC needs additional information to verify compliance with this rule. The NRC would also incur the costs of completing this rulemaking.

**Improvements in Knowledge.** The proposed regulatory action would improve knowledge by ensuring that applicants for newly designed nuclear power facilities perform a rigorous assessment of the effects of the impact of a large, commercial aircraft on the designed facility. Based on the insights gained from this assessment, the applicant would need to include in its application a description and evaluation of the design features, functional capabilities, and strategies to avoid or mitigate the effects of the aircraft impact, addressing core cooling capability, containment integrity, and spent fuel pool integrity. The applicant would need to describe how such design and other features avoid or mitigate, to the extent practicable, the aircraft impact effects with reduced reliance on operator actions.

**Safeguards and Security Considerations.** The proposed regulatory action to address the capability of newly designed power reactors relative to a potential aircraft impact is based both on enhanced public health and enhanced safety and common defense and security but is not necessary for adequate protection.



Rather, it would be to enhance the facility's inherent robustness.

### 3.2 Methodology

This section describes the process used to evaluate benefits and costs associated with the proposed regulatory action. The benefits (values) come from any desirable changes in the affected attributes which are solely qualitative for the proposed regulatory action; the costs (impacts or burdens) come from any undesirable changes in the affected attributes (e.g., monetary costs, increased exposures). As described in Section 3.1 of this regulatory analysis, the attributes expected to be affected include public health (accident), occupational health (accident), offsite property, onsite property, industry implementation, NRC implementation, improvements in knowledge, and safeguards and security considerations.

Ideally, a cost-benefit analysis quantifies the overall costs and benefits of the regulatory options relative to each of these attributes. This analysis relies on a qualitative evaluation of several of the affected attributes (public health, occupational health, offsite property, onsite property, improvements in knowledge, and safeguards and security considerations) because of the difficulty in quantifying the impact of the current rulemaking. The proposed regulatory action would affect these attributes through the associated reduction in the risks of aircraft impact damage to core cooling, containment integrity, spent fuel pool integrity, and other structures, systems, and components.

The remaining attributes (industry implementation and NRC implementation) are evaluated quantitatively. Quantitative analysis requires a characterization of the universe, including factors such as the number of applicants and the scope of the aircraft impact assessment being performed. The NRC analyzed incremental costs and benefits of the proposed regulatory action relative to the baseline (i.e., the no-action alternative described in Section 2 of this regulatory analysis).

Under OMB guidance and NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," Revision 4, issued September 2004, the results of the cost analysis are presented as discounted flows of funds using 3- and 7-percent real discount rates.

### 3.3 Data

The NRC derived information on the estimated number of applications submitted for a new standard design certification that does not reference a standard design approval from industry announcements. Given the uncertainty in the number of (1) new standard design approvals; (2) combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and (3) new manufacturing licenses that do not reference a standard design certification or standard design approval, the NRC staff applied its professional judgment in this analysis.

### 3.4 Assumptions

The proposed regulatory action would apply only to applications for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval, and those applicants with applications pending on the effective date of this rule. It would not apply to (1) a standard design certification or combined license issued before the effective date of the final rule, (2) the design certification rule, (3) Appendices A through D to 10 CFR part 52, or (4) a nuclear power reactor with a current operating license.

### 3.5 Analysis

For Sections 3.5.1 through 3.5.4, the cost-benefit analysis of the proposed regulatory action is based on the assumed number of applicants in each category. In each case, industry would incur both implementation and operation costs. Furthermore, because all of the benefits are measured qualitatively in this analysis, only costs are included in these subsections.

This analysis uses \$105 per hour for both NRC and industry staff rates. The annual results are derived as present values using the 3- and 7-percent discount rates as described in Appendix B to NUREG/BR-0184.

#### 3.5.1 Standard Design Certification Applications Not Referencing a Standard Design Approval

In implementing the proposed regulatory action, standard design

certification applicants would incur one-time costs to develop an SGI program, purchase an appropriate SGI storage container, perform the aircraft impact assessment, and incorporate the design features, functional capabilities, or strategies into the design based on the insights gained from the assessment. The NRC estimates that each applicant would spend 120 hours to develop the SGI program. Using the assumed staff rate of \$105 per hour, the one-time cost of developing the SGI program would be \$13,000 per applicant (120 hours × \$105/hour). The NRC also estimates it would cost \$2,500 to purchase an appropriate SGI storage container. Finally, the NRC estimates it would take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months × 4 weeks/month × 40 hours × \$105/hour) per application to complete the assessment and incorporate the results into the design. Thus, the one-time cost for an applicant to implement the proposed regulatory action is estimated to be \$420,000.

For the standard design certification process, this analysis assumes that three applications would be affected by the proposed rule in the first year following promulgation of this rule, and thereafter, one application would be submitted every 4 years at years 4, 8, 12, 16, and 20. Table 1 shows the discounted flow of funds (using 3- and 7-percent discount rates) of the total industry implementation costs for standard design certification applications over a 20-year period.

With respect to industry operational costs, there would be recordkeeping costs for retention of the assessment, evaluation, and supporting documentation. In addition, it is assumed that an applicant spends 3 hours per year to maintain the records. The estimated annual cost for recordkeeping is \$315 per applicant (3 hours × \$105/hour). However, for this analysis, it is assumed that it takes 4 years for the Commission to adopt the application as a final standard design certification rule, after which the records are retained by the applicant for 15 years as required by the standard design certification rule. Table 2 shows the discounted flow of funds of the recordkeeping costs (using 3- and 7-percent discount rates) for applications submitted over a 20-year period, using the schedule discussed previously.

TABLE 1.—SUMMARY OF INDUSTRY IMPLEMENTATION COSTS FOR STANDARD DESIGN CERTIFICATION APPLICANTS

Year	Number of standard design certification applications	Operating costs	
		Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
1 .....	3	1,200	1,200
4 .....	1	320	370
8 .....	1	240	330
12 .....	1	190	290
16 .....	1	140	260
20 .....	1	110	230
Total .....	8	2,200	2,680

TABLE 2.—SUMMARY OF INDUSTRY OPERATING COSTS FOR STANDARD DESIGN

Year*	Number of standard design certification applications	Implementation costs	
		Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
1 .....	3	6.6	10
4 .....	1	1.7	3
8 .....	1	1.3	2.6
12 .....	1	1.0	2.3
16 .....	1	0.74	2.1
20 .....	1	0.53	1.8
Total .....	8	11.87	21.8

\* Analysis assumes that it takes 4 years for the Commission to adopt the application as a final standard design certification rule, after which the records are retained by the applicant for 15 years.

### 3.5.2 Standard Design Approval Applications

Under the proposed regulatory action, an applicant for a standard design approval would need to comply with the requirements for an aircraft impact assessment in 10 CFR 52.500. However, the NRC staff concludes that it is unlikely that a request for a standard design would be submitted to the NRC for approval during the next 20 years. Therefore, no cost-benefit analysis was done for a standard design approval.

### 3.5.3 Combined License Applications Not Referencing a Standard Design Certification, Standard Design Approval, or Manufactured Reactor

Although the NRC concludes that there is a low probability of a combined license applicant not referencing a standard design certification, standard design approval, or manufactured reactor, this analysis assumes that one application would be submitted to the NRC in year 10 following promulgation of the rule.

In implementing the proposed regulatory action, combined license applicants would incur one-time costs to develop an SGI program, purchase an appropriate SGI storage container, perform the aircraft impact assessment, and incorporate the design features,

functional capabilities, and strategies into the design based on the insights gained from the assessment. The NRC estimates that each applicant would spend 120 hours to develop the SGI program. Assuming a staff rate of \$105 per hour, the one-time cost of developing the SGI program would be \$13,000 per applicant (120 hours × \$105/hour). The NRC also estimates it would cost \$2,500 to purchase an appropriate SGI storage container. Finally, the NRC estimates it would take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months × 4 weeks/month × 40 hours × \$105/hour) per application to complete the assessment and incorporate the results into the design. Thus, the one-time cost for an applicant to implement the proposed regulatory action is estimated to be \$420,000. For one application submitted in year 10, following promulgation of the rule, the discounted flow of funds of the implementation costs are \$310,000 and \$210,000 using 3- and 7-percent discount rates, respectively.

With respect to industry operational costs, there would be recordkeeping costs for retention of the assessment, evaluation, and supporting documentation. In addition, it is assumed that an applicant spends 3

hours per year to maintain the records. The estimated annual cost for recordkeeping is \$315 per applicant (3 hours × \$105/hour). For this analysis, it is assumed that it takes 4 years for the Commission to approve the application, after which the records are retained by the licensee for 60 years, at which time the Commission terminates the facility license. The discounted flow of funds of the recordkeeping costs for one application are \$5,400 and \$1,700 using 3- and 7-percent discount rates, respectively.

The total industry cost is the sum of the implementation and operation costs. The implementation cost is the present value of the assumed one application (\$420,000) which when discounted is \$310,000 (using a 3-percent discount rate) and \$210,000 (using a 7-percent discount rate). The operating costs are \$5,400 and \$1,700 using the 3- and 7-percent discount rates as shown above. Therefore, the total discounted industry costs are \$315,400 and \$211,700 using 3- and 7-percent discount rates, respectively.

3.5.4 Manufacturing License Applications Not Referencing a Standard Design Certification or Standard Design Approval

Although the NRC concludes that there is a low probability of a manufacturing license application not referencing a standard design certification or standard design approval, this analysis assumes that one application would be submitted to the NRC in year 10 following promulgation of the rule.

In implementing the proposed regulatory action, manufacturing license applicants would incur one-time costs to develop an SGI program, purchase an appropriate SGI storage container, perform the aircraft impact assessment, and incorporate the design features, functional capabilities, and strategies into the design based on the insights gained from the assessment. The NRC estimates that each applicant would spend 120 hours to develop the SGI program. Assuming a staff rate of \$105 per hour, the one-time cost of developing the SGI program would be \$13,000 per applicant (120 hours × \$105/hour). The NRC also estimates it would cost \$2,500 to purchase an appropriate SGI storage container. Finally, the NRC estimates it would take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months × 4 weeks/month × 40 hours × \$105/hour) per application to complete the assessment and incorporate the results into the design. Thus, the one-time cost for an applicant to implement the proposed regulatory action is estimated to be \$420,000. For one application submitted in year 10, following promulgation of the rule, the discounted flow of funds of the implementation costs are \$310,000 and \$210,000 using 3- and 7-percent discount rates, respectively.

With respect to industry operational costs, there would be recordkeeping costs for retention of the assessment, evaluation, and supporting documentation. In addition, it is assumed that an applicant spends 3 hours per year to maintain the records. The estimated annual cost for recordkeeping is \$315 per applicant (3 hours × \$105/hour). For this analysis, it is assumed that it takes 4 years for the Commission to approve the application, after which the records are retained by the licensee for 15 years, at which time the Commission terminates the license. The discounted flow of funds of the recordkeeping costs for one application are \$3,300 and \$2,200 using 3- and 7-percent discount rates, respectively.

The total industry cost is the sum of the implementation and operation costs. The implementation cost is the present value of the assumed one application (\$420,000) which when discounted is \$310,000 (using a 3-percent discount rate) and \$210,000 (using a 7-percent discount rate). The operating costs are \$3,300 and \$2,200 using the 3- and 7-percent discount rates as shown above. Therefore, the total discounted industry costs are \$313,300 and \$212,200 using 3- and 7-percent discount rates, respectively.

3.5.5 NRC Implementation

*Cost to Review the Applicant's Results.* The NRC would incur costs to review the applicant's actions in response to the requirements of the proposed rule. The one-time cost to (1) review the actions taken by each applicant for a new standard design certification that does not reference a standard design approval; a combined license that does not reference a standard design certification, standard design approval, or manufactured reactor; and a new manufacturing license that does not reference a standard design certification or standard

design approval, and (2) review the assessment if the NRC requires additional information to verify compliance with this rule is estimated to be \$17,000 (1 staff-month × 4 weeks/month × 40 hours × \$105/hour).

As an example, the total NRC cost for the first year of implementing the proposed rule is the present value of the costs of reviewing three applications for standard design certifications and reviewing the assessments at \$51,000 for all three applications. This corresponds to a net present value of \$50,000 (using a 3-percent discount rate) and \$48,000 (using a 7-percent discount rate).

*Cost to Develop Guidance.* The NRC would incur 0.5 full-time equivalent (FTE) of staff time to develop guidance to support implementation of the proposed regulatory action. The cost for this action is estimated to be \$76,000 (0.5 FTE at \$152,000/FTE).

*Cost to Provide Training.* The NRC would incur costs to develop a training course to instruct NRC staff on the proposed changes to 10 CFR part 52. Assuming that it would take 20 staff-hours to develop the training course, the cost is estimated to be \$2,100 (20 staff-hours × \$105/hour). The cost to train 20 people for 2 hours, plus the instructor's time of 2 hours is estimated to be \$4,400 (21 people × 2 hours × \$105/hour). The total cost to the NRC to provide training for the proposed regulatory action is estimated to be \$7,000.

*Cost of the Regulatory Action.* The NRC would incur 2.2 FTE of staff time and \$150,000 in contractor support to complete this rulemaking after publishing the proposed rule. The cost of this action is estimated to be \$484,000 (2.2 FTE at \$152,000/FTE + \$150,000).

Table 3 shows the discounted flow of funds of the total NRC implementation costs for the proposed regulatory action over 20 years.

TABLE 3.—SUMMARY OF NRC IMPLEMENTATION COSTS

Year	Application		Implementation costs	
	Number reviewed	Category*	Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
1 .....	3	DC .....	48	50
4 .....	1	DC .....	13	15
8 .....	1	DC .....	10	13
10 .....	1	COL .....	9	13
10 .....	1	ML .....	9	13
12 .....	1	DC .....	8	12
16 .....	1	DC .....	6	11
20 .....	1	DC .....	4	9
Cost to Review All Applications .....			107	136
Cost to Develop Guidance .....			76	76
Cost to Provide Training .....			7	7

TABLE 3.—SUMMARY OF NRC IMPLEMENTATION COSTS—Continued

Year	Application		Implementation costs	
	Number reviewed	Category*	Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
Cost of the Regulatory .....			484	484
Total (rounded) .....			670	700

\* DC = design certification. COL = combined license application. ML = manufacturing license application.

3.5.6 Impacts to Other Stakeholders

The NRC staff has not identified any impacts to other stakeholders or the Agreement States. However, the proposed action would lead to an increase in public confidence because nuclear power plant designers would perform a rigorous assessment of design and other features that could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

3.5.7 Qualitative Benefits of the Proposed Action

The benefits of the proposed rule can be evaluated only on a qualitative basis. The analysis estimates that the proposed action would result in qualitative benefits in public health (accidental), occupational health (accidental), offsite property, onsite property, improvements

in knowledge, and safeguards and security considerations.

Specifically, the benefits would include improvements in knowledge because applicants for new power reactor designs would need to evaluate the design features, functional capabilities, and strategies to avoid or mitigate the effects of the aircraft impact, addressing core cooling capability, containment integrity, and spent fuel pool integrity. If the effects are not assessed by facility designers, it would be more difficult to enhance the inherent robustness of the facility to avoid or mitigate the effects of the aircraft impact. Furthermore, designers of new facilities would need to describe how the design features, functional capabilities, and strategies adopted based on the insights of the assessment avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on

operator actions. In this manner, this proposed rule would result in newly designed nuclear power reactor facilities being more inherently robust with regard to a potential aircraft impact than if they were designed in the absence of this rule.

In addition, because the impact of a large, commercial aircraft is a beyond-design-basis event, this rule would provide an enhanced level of protection beyond that which is provided by the existing adequate protection requirements, which all operating facilities are required to meet, and the proposed adequate protection requirements that facilities will be required to meet if they are made final (see Section I of this document).

4. Presentation of Results

Table 4 summarizes the results of the NRC's cost-benefit analysis for industry.

TABLE 4.—SUMMARY OF TOTAL INDUSTRY COSTS FOR PROPOSED ACTION

Category of application*	Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
<b>Implementation Costs</b>		
DC .....	2,200	2,680
COL .....	210	310
ML .....	210	310
<b>Operating Costs</b>		
DC .....	11.87	21.8
COL .....	1.7	5.4
ML .....	2.2	3.3
Total (rounded) .....	2,600	3,300

\* DC = design certification. COL = combined license application. ML = manufacturing license application.

Table 5 shows the total costs of the proposed regulatory action.

TABLE 5.—SUMMARY OF INDUSTRY AND NRC COSTS

	Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
Industry .....	2,600	3,300
NRC .....	670	700

TABLE 5.—SUMMARY OF INDUSTRY AND NRC COSTS—Continued

	Using 7-percent discount rate (\$1,000)	Using 3-percent discount rate (\$1,000)
Total (rounded) .....	3,300	4,000

5. Decision Rationale

The total present-valued costs of this proposed action are \$4.0 million and \$3.3 million for 3- and 7-percent discount rates, respectively. The benefits are expressed only qualitatively and are discussed in Section 3.5.7 of this regulatory analysis. As noted previously, the key benefit is improvements in knowledge because applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval would need to assess the effects of the impact of a large, commercial aircraft on the nuclear power plant. Based on the insights gained from this assessment, nuclear power plant designers could provide additional inherent protection to avoid or mitigate, to the extent practicable, the effects of an aircraft impact, with reduced reliance on operator actions.

6. Implementation Schedule

After publication of the proposed rule in the **Federal Register** and consideration and resolution of the public comments, the NRC would publish a final rule which would become effective 30 days after publication.

The Commission requests public comments on the draft regulatory analysis. Interested persons may submit comments on the draft analysis to the NRC as indicated under the **ADDRESSES** heading.

**XVI. Regulatory Flexibility Act Certification**

In accordance with the Regulatory Flexibility Act (5 U.S.C. 605(b)), the Commission certifies that this rule will not, if promulgated, have a significant economic impact on a substantial number of small entities. This proposed rule affects only the licensing and operation of nuclear power plants. The companies that own these plants do not fall within the scope of the definition of "small entities" set forth in the Regulatory Flexibility Act or the size

standards established by the NRC (10 CFR 2.810).

**XVII. Backfit Analysis**

The NRC has determined that neither the backfit rule, 10 CFR 50.109, nor any of the finality provisions in 10 CFR part 52, apply to this proposed rule and, therefore, a backfit analysis is not required, because the proposed rule does not contain any provisions that would impose backfitting as defined in the backfit rule, nor does it contain provisions that would require a finding of compliance or adequate protection under the finality provisions in 10 CFR part 52.

The proposed rule applies only to applicants for a standard design certification not referencing a standard design approval; a standard design approval; a combined license not referencing a standard design certification, standard design approval, manufacture reactor; or a manufacturing license not referencing a standard design certification or standard design approval that are pending at the time of or submitted after the effective date of the final rule. There are no existing combined licenses or manufacturing licenses protected by the backfitting restrictions in 10 CFR 50.109 or the finality provisions in 10 CFR part 52. To the extent that the proposed rule would revise the requirements for future design certifications, combined licenses, or manufacturing licenses the requirements would not constitute backfitting or otherwise be inconsistent with the finality provisions in 10 CFR part 52, because the requirements are prospective in nature and effect. Neither the backfit rule nor the finality provisions in 10 CFR part 52 were intended to apply to every NRC action which substantially changes the expectations of future applicants under 10 CFR part 52.

**List of Subjects in 10 CFR Part 52**

Administrative practice and procedure, Antitrust, Backfitting, Combined license, Early site permit, Emergency planning, Fees, Inspection, Limited work authorization, Nuclear power plants and reactors, Probabilistic risk assessment, Prototype, Reactor siting criteria, Redress of site, Reporting and recordkeeping requirements,

Standard design, Standard design certification.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR part 52.

**PART 52—LICENSES, CERTIFICATIONS, AND APPROVALS FOR NUCLEAR POWER PLANTS**

1. The authority citation for part 52 continues to read as follows:

**Authority:** Secs. 103, 104, 161, 182, 183, 185, 186, 189, 68 Stat. 936, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2133, 2201, 2232, 2233, 2235, 2236, 2239, 2282); secs. 201, 202, 206, 88 Stat. 1242, 1244, 1246, as amended (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note).

2. In § 52.11, paragraph (b) is revised to read as follows:

**§ 52.11 Information collection requirements: OMB approval.**

\* \* \* \* \*

(b) The approved information collection requirements contained in this part appear in §§ 52.7, 52.15, 52.16, 52.17, 52.29, 52.35, 52.39, 52.45, 52.46, 52.47, 52.57, 52.63, 52.75, 52.77, 52.79, 52.80, 52.93, 52.99, 52.110, 52.135, 52.136, 52.137, 52.155, 52.156, 52.157, 52.158, 52.171, 52.177, 52.500, and appendices A, B, C, D, and N of part 52.

3. In § 52.47, paragraph (a)(28) is added to read as follows:

**§ 52.47 Contents of applications; technical information.**

\* \* \* \* \*

(a) \* \* \*

(28) For applications for standard design certifications which are subject to 10 CFR 52.500, the information required by 10 CFR 52.500.

\* \* \* \* \*

4. In § 52.79, paragraph (a)(47) is added to read as follows:

**§ 52.79 Contents of applications; technical information in final safety analysis report.**

(a) \* \* \*

(47) For applications for combined licenses which are subject to 10 CFR 52.500, the information required by 10 CFR 52.500.

\* \* \* \* \*

5. In § 52.137, paragraph (a)(26) is added to read as follows:

**§ 52.137 Contents of applications; technical information.**

\* \* \* \* \*

(a) \* \* \*

(26) For applications for standard design approvals which are subject to 10 CFR 52.500, the information required by 10 CFR 52.500.

\* \* \* \* \*

6. In § 52.157, paragraph (f)(32) is added to read as follows:

**§ 52.157 Contents of applications; technical information in final safety analysis report.**

\* \* \* \* \*

(f) \* \* \*

(32) For applications for manufacturing licenses which are subject to 10 CFR 52.500, the information required by 10 CFR 52.500.

7. In § 52.303, paragraph (b) is revised to read as follows:

**§ 52.303 Criminal penalties.**

\* \* \* \* \*

(b) The regulations in part 52 that are not issued under Sections 161b, 161i, or 161o for the purposes of Section 223 are as follows: §§ 52.0, 52.1, 52.2, 52.3, 52.7, 52.8, 52.9, 52.10, 52.11, 52.12, 52.13, 52.15, 52.16, 52.17, 52.18, 52.21, 52.23, 52.24, 52.27, 52.28, 52.29, 52.31, 52.33, 52.39, 52.41, 52.43, 52.45, 52.46, 52.47, 52.48, 52.51, 52.53, 52.54, 52.55, 52.57, 52.59, 52.61, 52.63, 52.71, 52.73, 52.75, 52.77, 52.79, 52.80, 52.81, 52.83, 52.85, 52.87, 52.93, 52.97, 52.98, 52.103, 52.104, 52.105, 52.107, 52.109, 52.131, 52.133, 52.135, 52.136, 52.137, 52.139, 52.141, 52.143, 52.145, 52.147, 52.151, 52.153, 52.155, 52.156, 52.157, 52.158, 52.159, 52.161, 52.163, 52.165, 52.167, 52.171, 52.173, 52.175, 52.177, 52.179, 52.181, 52.301, 52.303, 52.500, and 52.502.

8. A new subpart K—Additional Requirements and § 52.500 are added to read as follows:

**Subpart K—Additional Requirements**

Sec.

52.500 Aircraft impact assessment.  
52.502 Control of changes to FSAR information.

**Subpart K—Additional Requirements**

**§ 52.500 Aircraft impact assessment.**

(a) The requirements of this section apply to all standard design certifications issued after [EFFECTIVE DATE OF FINAL RULE] that do not reference a standard design approval; standard design approvals issued after [EFFECTIVE DATE OF FINAL RULE]; combined licenses issued after

[EFFECTIVE DATE OF FINAL RULE] that do not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing licenses issued after [EFFECTIVE DATE OF FINAL RULE] that do not reference a standard design certification or standard design approval.

(b) Each applicant for a standard design certification not referencing a standard design approval; a standard design approval; a combined license not referencing a standard design certification, standard design approval, manufacture reactor; or a manufacturing license not referencing a standard design certification or standard design approval shall perform a design-specific assessment of the effects on the designed facility of the impact of a large, commercial aircraft. Such assessment must be based on the Commission's specified aircraft characteristics used to define the beyond-design-basis impact of a large, commercial aircraft used for long distance flights in the United States, with aviation fuel loading typically used in such flights, and an impact speed and angle of impact considering the ability of both experienced and inexperienced pilots to control large, commercial aircraft at the low altitude representative of a nuclear power plant's low profile.

(c) Based upon the insights gained from the aircraft impact assessment as stated in paragraph (b) of this section, the application must include a description and evaluation of the design features, functional capabilities, and strategies to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact. The evaluation of such design features, functional capabilities, and strategies must include core cooling capability, containment integrity, and spent fuel pool integrity. The application must describe how such design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

**§ 52.502 Control of changes to FSAR information.**

(a) For standard design certifications which are subject to 10 CFR 52.500, generic changes to the information required by 10 CFR 52.47(a)(28) to be included in the final safety analysis report are governed by the applicable requirements of 10 CFR 52.63.

(b) For combined license applicants or holders which are not subject to 10 CFR 52.500 but reference a standard design certification which is subject to 10 CFR 52.500, proposed departures from the

information required by 10 CFR 52.47(a)(28) to be included in the final safety analysis report for the standard design certification are governed by the change control requirements in the applicable design certification rule.

(c) For combined licenses which are subject to 10 CFR 52.500, if the licensee changes the information required by 10 CFR 52.79(a)(47) to be included in the final safety analysis report, then the licensee shall re-perform that portion of the evaluation required by 10 CFR 52.500(c) addressing the changed feature, capability, or strategy, and describe, in the re-evaluation, how the modified design features, functional capabilities, and strategies avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions.

(d) For manufacturing licenses which are subject to 10 CFR 52.500, generic changes to the information required by 10 CFR 52.157(f)(32) to be included in the final safety analysis report are governed by the applicable requirements of 10 CFR 52.171.

(e) For combined license applicants or holders which are not subject to 10 CFR 52.500 but reference a manufactured reactor which is subject to 10 CFR 52.500, proposed departures from the information required by 10 CFR 52.157(f)(32) to be included in the final safety analysis report for the manufacturing license are governed by the applicable requirements in 10 CFR 52.171(b)(2).

Dated at Rockville, Maryland, this 27th day of September 2007.

For the Nuclear Regulatory Commission.

**Annette L. Vietti-Cook,**

*Secretary of the Commission.*

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**DEPARTMENT OF HOMELAND SECURITY**

**Coast Guard**

**33 CFR Part 165**

[Docket No. USCG-2007-29354]

RIN 1625-AA87

**Security Zone; Nawiliwili Harbor, Kauai, HI**

**AGENCY:** Coast Guard, DHS.

**ACTION:** Notice of proposed rulemaking.

**SUMMARY:** The Coast Guard proposes to create a security zone in the waters of Nawiliwili Harbor, Kauai, and on the land of the jetty south of Nawiliwili