

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 50 and 52

RIN 3150-A119

[NRC-2007-0009]

Consideration of Aircraft Impacts for New Nuclear Power Reactors

AGENCY: U.S. Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC or the Commission) is amending its regulations to require applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant is required to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. In addition, these amendments contain requirements for control of changes to any design features or functional capabilities credited for avoiding or mitigating the effects of an aircraft impact. These requirements apply to applicants for and holders of new construction permits; applicants for and holders of new operating licenses that reference a new construction permit; applicants for new standard design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses; and applicants for and holders of manufacturing licenses. In addition, the requirements apply to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license. The final aircraft impact rule, by ensuring that all design certifications referenced in a combined license comply with the aircraft rule, effectively ensures that the design of every combined license complies with the

final rule.

ADDRESSES: You can access publicly available documents related to this document using the following methods:

Federal e-Rulemaking Portal: Go to <http://www.regulations.gov> and search for documents filed under Docket ID [NRC-2008-0009]. Address questions about NRC dockets to Carol Gallagher 301-415-5905; e-mail Carol.Gallagher@nrc.gov.

NRC's Public Document Room (PDR): The public may examine and have copied for a fee publicly available documents at the NRC's PDR, Public File Area O F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland.

NRC's Agencywide Documents Access and Management System (ADAMS): Publicly available documents created or received at the NRC are available electronically at the NRC's electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. From this page, 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 NRC's PDR reference staff at 1-899-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.

DATES: The effective date is **[INSERT DATE 30 DAYS AFTER THE DATE OF PUBLICATION]**.

FOR FURTHER INFORMATION CONTACT: Mr. Stewart Schneider, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone 301-415-4123; e-mail: Stewart.Schneider@nrc.gov or Ms. Nanette Gilles, Office of New Reactors, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone 301-415-1180; e-mail: Nanette.Gilles@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Introduction

II. Currently Operating Power Reactors

III. Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications

IV. Renewal of an Operating License, Standard Design Certification, Combined License, or Manufacturing License

V. New Nuclear Power Reactors

A. Introduction

B. Description of Beyond-Design-Basis Aircraft Impact

C. Aircraft Impact Assessment

VI. Responses to Public Comments

A. Overview of Public Comments

B. Responses to Specific Requests for Comments

C. Responses to Remaining Comments

VII. Section-by-Section Analysis

VIII. Guidance

IX. Availability of Documents

X. Agreement State Compatibility

XI. Voluntary Consensus Standards

XII. Finding of No Significant Environmental Impact: Availability

XIII. Paperwork Reduction Act Statement

XIV. Regulatory Analysis

XV. Regulatory Flexibility Certification

XVI. Backfit Analysis

XVII. Congressional Review Act

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 the NRC's requirements that apply to the design, construction, testing, operation, and maintenance of design features and functional capabilities for design basis events will not apply to design features or functional capabilities selected by the applicant solely to meet the requirements of this final rule. The NRC's approach to aircraft impacts is consistent with its previous approach to beyond-design-basis events. The objective of this rule is to require nuclear power plant¹ designers to perform a rigorous assessment of the design to identify design features and functional capabilities that could provide additional inherent protection to avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. This rule should result in new nuclear power reactor facilities being more inherently robust with regard to an aircraft impact than if they were designed in the absence of this final rule. This final rule 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.

This final rule applies to applicants for and holders of new construction permits;
applicants for and holders of new operating licenses that reference a new construction permit;

¹ The requirements of the final aircraft impact rule may apply, in some contexts, to the designer who is responsible for, or seeks certification or regulatory approval of something less than a complete nuclear power plant, *e.g.*, a nuclear reactor without site-specific elements such as the ultimate heat sink. For ease of discussion in the remainder of this Supplementary Information, reference to a "nuclear power plant designer" or "facility designer" is meant to include, in the appropriate context, a designer of something less than a complete nuclear power plant, but is at least as encompassing as a "nuclear reactor." Similarly, a reference to the design of a "facility" also encompasses, in the appropriate context, the design of something less than a complete nuclear power plant, *e.g.*, the design of a reactor.

applicants for new standard design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses; and applicants for and holders of manufacturing licenses. In addition, the requirements apply to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license. The final aircraft impact rule, by ensuring that all design certifications referenced in a combined license comply with the aircraft rule, effectively ensures that the design of every combined license complies with the final rule. All of these applicants as a whole are referred to as “applicants for new nuclear power reactors” throughout the remainder of the Supplementary Information. These applicants are required to perform an assessment of the effects on the designed facility of the impact of a large, commercial aircraft. Applicants must identify and incorporate into the design those practical design features and functional capabilities that avoid or mitigate the effects of an aircraft impact, addressing core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. Applicants are required to describe how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. Applicants and licensees are subject to requirements for the control of changes to the design features and functional capabilities identified as a result of complying with this final rule.

The Commission-approved design basis threat (DBT) does not include an aircraft attack. The NRC published its final DBT rule in the *Federal Register* on March 19, 2007 (72 FR 12705) (Title 10, § 73.1, “Purpose and scope,” of the *Code of Federal Regulations* (10 CFR 73.1)). 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 (U.S.). 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 first 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 (71 FR 62663; October 26, 2006), specifically, the proposed Appendix C to 10 CFR part 73, "Licensee Safeguards Contingency Plans." During development of the power reactor security final rule, the NRC determined that several significant changes to the proposed rule language would be needed to adequately address stakeholder comments and associated implementation concerns. To address these comments and concerns, the NRC proposed to relocate the provisions from 10 CFR part 73 to a new paragraph (hh) in 10 CFR 50.54, "Conditions of licenses," in a supplement to the power reactor security requirements proposed rule (73 FR 19443; April 10, 2008). Should the requirements in proposed 10 CFR 50.54(hh), which are promulgated on the basis of adequate protection of public health and safety and common defense and security, be finalized, all current and future power reactors would be required to comply with them.

The current requirements, in conjunction with the currently proposed revisions to 10 CFR 50.54 to address loss of large areas of the plant due to explosions or fires, will continue to provide adequate protection of the public health and safety and the common defense and security. Nevertheless, the Commission has decided to also require applicants for new nuclear

power reactors to incorporate into their design additional practical features that would avoid or mitigate the effects of an aircraft impact. This final rule to address the capability of new nuclear power reactors relative to an aircraft impact is based both on enhanced public health and safety and enhanced common defense and security, but is not necessary for adequate protection. Rather, this rule's goal is to enhance the facility's inherent robustness at the design stage.

Requiring applicants for new nuclear power reactors to perform a rigorous aircraft impact assessment and identify and incorporate into their design those design features and functional capabilities that address the effects of a beyond-design-basis aircraft impact is consistent with the NRC's historic approach to beyond-design-basis events and 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). 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," (59 FR 35461; July 12, 1994), when it stated, "The Commission expects that advanced reactors would provide enhanced margins of safety and/or utilize simplified, inherent, passive, or other innovative means to 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. The final aircraft impact rule will further enhance the safety of new nuclear power plants for aircraft impacts and is consistent with these policy statements.

The Commission considered the appropriate location for requirements on an aircraft impact assessment during its deliberations on the security assessment rulemaking (draft 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. In its Staff Requirements Memorandum (SRM) on SECY-06-0204, dated April 24, 2007, 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," to encourage reactor designers to incorporate practical measures at an early stage in the design process.

As a result of the Commission's SRM, the NRC published a proposed rule for comment in the *Federal Register* (72 FR 56287; October 3, 2007). The proposed rule would have required applicants to assess the effects of the impact of a large, commercial aircraft on the nuclear power facility. Based on the insights gained from the assessment, the applicant would have been required 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 the aircraft impact with reduced reliance on operator actions. The public comment period for the proposed rule closed on December 17, 2007. A public meeting was held during the public comment period to discuss the proposed rule and to address any questions on the proposed rule. The NRC received 32 comment letters from industry representatives, public interest groups, and concerned citizens on the proposed rule.

This final rule revises 10 CFR parts 50, "Domestic Licensing of Production and Utilization Facilities," and 52 to require applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant is required to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. This aircraft impact rule, along with provisions in the NRC's proposed power reactor security rule, the supplemental

proposed rule amending 10 CFR 50.54(hh), and voluntarily-submitted safeguards assessments, render as duplicative and, therefore, unnecessary the draft proposed rule (10 CFR 73.62) to require security assessments. The draft proposed security assessment 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 provisions of that draft proposed rule applicable to large fires and explosions from an aircraft impact are subsumed by this final aircraft impact rule and by the proposed changes to 10 CFR 50.54(hh). Sufficient target set provisions are included in the NRC's proposed changes to 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage," which applicants for new facilities would have to satisfy should that rule become final. Designers of new nuclear power reactors are encouraged to account for the provisions for mitigation of large fires and explosions in the facility design so as to minimize more costly, post-design features to meet those requirements. Design certification and combined license applicants are voluntarily submitting security assessments that identify design features to protect target sets against DBTs. Accordingly, the draft proposed 10 CFR 73.62 is not necessary.

This new aircraft impact assessment rule complements the proposed revisions to 10 CFR 50.54(hh) to mitigate the effects of large fires and explosions. The proposed 10 CFR 50.54(hh) provisions on mitigating large fires and explosions would codify the adequate protection requirement imposed on existing operating reactors by ICM Order, Item B.5.b. The 10 CFR 50.54(hh) provisions, therefore, are necessary for adequate protection and must remain in regulations that are applicable to all currently operating reactors and must be satisfied by all newly licensed power reactors. Current reactor licensees have already developed and implemented procedures that would comply with these proposed 10 CFR 50.54(hh) requirements, and would not require any additional action to comply with these proposed rule

provisions. New applicants for and new holders of operating licenses under 10 CFR part 50 and combined licenses under 10 CFR part 52 would be required to develop and implement procedures that would employ mitigating strategies similar to those now employed by current licensees to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities under the circumstances associated with loss of large areas of the plant due to explosions or fire. The requirements described in proposed 10 CFR 50.54(hh) relate to the development of procedures for addressing certain events that are the cause of large fires and explosions that affect a substantial portion of the nuclear power plant, and are not limited or directly linked to an aircraft impact. The rule contemplates that the initiating event for such large fires and explosions could be any number of DBT or beyond-DBT events. In addition, the NRC regards proposed 10 CFR 50.54(hh) as necessary for reasonable assurance of adequate protection to public health and safety and common defense and security. This is consistent with the NRC's designation of the orders on which proposed 10 CFR 50.54(hh) is based as being necessary for reasonable assurance of adequate protection.

In contrast to the adequate protection requirements of proposed 10 CFR 50.54(hh), this aircraft impact final rule will enhance safety and security by requiring an assessment of newly designed facilities to avoid or mitigate the effects of aircraft impacts. New nuclear power reactor applicants will be subject to both the requirements of the aircraft impact rule and the proposed requirements in 10 CFR 50.54(hh). The overall objective of these rules is to enhance a nuclear power plant's capabilities to withstand the effects of a large fire or explosion, whether caused by an aircraft impact or other event, from the standpoints of both design and operation. The impact of a large aircraft on the nuclear power plant is regarded as a beyond-design-basis event. In light of the NRC's view that effective mitigation of the effects of events causing large fires and explosions (including the impact of a large, commercial aircraft) can be provided through operational actions, the NRC believes that the mitigation of the effects of aircraft impacts

through design should be regarded as a safety enhancement which is not necessary for adequate protection. Therefore, the aircraft impact rule—unlike the proposed 10 CFR 50.54(hh)—is regarded as a safety enhancement, which is not necessary for adequate protection.

The NRC regards the aircraft impact and 10 CFR 50.54(hh) rulemakings to be complementary in scope and objective. The aircraft impact rule focuses on enhancing the design of future nuclear power plants to withstand large, commercial aircraft impacts, with reduced reliance on operator actions. Proposed 10 CFR 50.54(hh) focuses on ensuring that the nuclear power plant's licensees will be able to implement effective mitigation measures for large fires and explosions, including (but not explicitly limited to) those caused by the impact of a large, commercial aircraft.

Consideration of a rule to require applicants for new nuclear power reactors to perform an aircraft impact assessment and describe design features and functional capabilities 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 nuclear power reactors 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.

The NRC is making several changes from the proposed rule requirements in this final

rule. First, based on consideration of public comments and implementation issues, the NRC is expanding the class of applicants that are required to comply with this rule. In one change, the NRC is applying the final rule to 10 CFR part 50 license applicants as well as applicants under 10 CFR part 52. The final rule requires both new power reactor construction permit applicants and operating license applicants to perform the required assessment and include the description of the identified design features and functional capabilities in their applications. The NRC is applying the final rule to applicants at both the construction permit and operating license stages because it is not until the operating license stage that the applicant is required to provide the NRC with its final design. The NRC can issue a construction permit based on preliminary design information. Therefore, the NRC believes it is necessary to require applicants to perform the aircraft impact assessment at both stages and to include the required information in both applications based on the level of design information available at the time of each application. These changes are reflected in the addition of new paragraphs (a)(13) and (b)(12) in 10 CFR 50.34, "Contents of construction permit and operating license applications; technical information," requiring all applicants for a construction permit or operating license which are subject to 10 CFR 50.150 (proposed 10 CFR 52.500) to submit the information required by 10 CFR 50.150 as a part of their application. Paragraph (a) of 10 CFR 50.150 has similarly been revised.

In making these additions, the NRC is making it clear that the requirements are not meant to apply to current or future operating license applications for which construction permits were issued before the effective date of this final rule. This is because existing construction permits are likely to involve designs which are essentially complete and may involve sites where construction has already taken place. Applying the final rule to operating license applications for which there are existing construction permits could result in a financial burden to change a design for a plant that is partially constructed. Such a financial burden is not justifiable in light of

the fact that the NRC considers the events to which the aircraft impact rule is directed to be beyond-design-basis events and compliance with the rule is not needed for adequate protection to public health and safety or common defense and security. Moreover, such operating license applicants would be required to comply with the requirements in proposed 10 CFR 50.54(hh) to identify actions to mitigate the effects of large fires and explosions, including those caused by aircraft impacts. For these reasons, the NRC is not requiring operating license applicants with an existing construction permit to comply with the final rule.

The NRC is also adding requirements in 10 CFR 50.150(d) (proposed 10 CFR 52.502) for controlling changes to the information required by 10 CFR 50.150(c) to be included in the preliminary safety analysis report (PSAR) by a construction permit applicant and the final safety analysis report (FSAR) by an operating license applicant. The NRC is applying the same change control requirements to construction permit and operating license holders as it is applying to combined license holders. If the permit holder or licensee changes the information required by 10 CFR 50.34 to be included in the PSAR or FSAR, then the permit holder or licensee must consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34 to be included in the PSAR or FSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

Because the final rule is applicable to applicants under both 10 CFR parts 50 and 52, the NRC is relocating the aircraft impact assessment requirements that were contained in proposed 10 CFR 52.500 to a new section, 10 CFR 50.150. This change is also consistent with the recent revision to 10 CFR part 52, where 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 making conforming changes involving 10 CFR part 50 provisions in that rulemaking, the NRC adopted the general principle of keeping technical requirements in 10 CFR part 50 and maintaining applicable procedural requirements in 10 CFR part 52. For these reasons, the NRC is relocating the proposed aircraft impact requirements from proposed 10 CFR 52.500 to 10 CFR 50.150.

Based on public comments, the NRC is making the requirements in 10 CFR 50.150 applicable to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license. This change is discussed in detail in Section III, “Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications,” of this document.

The NRC is also making several changes to the terminology that was used in the proposed rule. In the proposed rule, 10 CFR 52.500 stated that applicants for new nuclear power reactors were required to perform a design-specific assessment of the effects of the designed facility of the impact of a large, commercial aircraft. Based on the insights gained from that assessment, applicants would have been required to include a description and “evaluation” of the design features, functional capabilities, and strategies to avoid or mitigate the effects of the applicable aircraft impact. Reference to such an “evaluation” was made throughout the Supplementary Information in the proposed rule. However, the NRC determined that the term “evaluation” was used in more than one context and concluded that such inconsistent use could cause confusion. In the final rule, the NRC has eliminated the use of the term “evaluation” in the rule language. The new requirements governing what covered applicants are required to submit in their applications (10 CFR 50.150(c)) states that applicants must submit a description of the design features and functional capabilities identified in the assessment and a description of how the design features and functional capabilities avoid or mitigate, to the extent practical, the effects of the aircraft impact.

Another area where the NRC is changing the terminology used in the final aircraft impact rule is the elimination of the term, “strategies.” The proposed aircraft impact rule required the assessment to include a description of the design features, functional capabilities, and strategies to avoid or mitigate the effects of the applicable, beyond-design-basis aircraft impact (proposed 10 CFR 52.500(c)). Neither the proposed rule nor its Supplementary Information defined “strategies.” Upon consideration, the NRC has decided to eliminate that term in the final rule. A “strategy” is typically associated with human action and may, therefore, appear to conflict with the direction in 10 CFR 50.150(b)(1) of the final aircraft impact rule that there should be “reduced reliance on operator actions.” In addition, the aircraft impact rule is focused only on design, and was not intended to address or impose requirements on the operation of a facility. By using the term, “strategies” in the proposed aircraft impact rule, there is a real possibility that stakeholders may erroneously interpret the aircraft impact rule as requiring a designer to address as part of the aircraft impact rule the requirements in NRC’s proposed changes to 10 CFR 50.54(hh) (73 FR 19443; April 10, 2008) to mitigate the effects of large fires and explosions.² This would be an unnecessary duplication of effort, and would require consideration of procedural and operational matters at an early stage, which is not the NRC’s intent and may not be the optimal time for consideration of operational matters. For these reasons, the NRC is dropping its use of the term “strategies” in the final rule. Thus, under 10 CFR 50.150(c), the relevant applicants need only include in their applications a description of the relevant identified design features and functional capabilities, and need not address

² The NRC’s proposed rulemaking on 10 CFR 50.54(hh) would codify the adequate protection requirement imposed on existing operating reactors by ICM Order, Item B.5.b. That proposed rule would require licensees’ Integrated Response Plans to include specific procedures, guidance, and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities using existing or readily available resources that can be effectively implemented under the circumstances associated with loss of large areas of the plant due to explosions or fires. See 73 FR 19443; April 10, 2008.

strategies. The elimination of the term “strategies,” does not, however, relieve applicants from the responsibility to consider reducing reliance on operator actions in performance of the aircraft impact assessment and identification of design features and functional capabilities to comply with this final rule.

The NRC’s decision to remove the need for the designer to identify design “strategies” does not, however, obviate the need for the designer to determine, when considering potential design features and functional capabilities, whether there are responsive actions and strategies (e.g., firefighting) that the nuclear power plant licensee could take to mitigate the effects of the impact of a large commercial aircraft that would be made possible, or whose effectiveness could be enhanced, by inclusion of such features and capabilities in the design. One objective of the final aircraft impact rule is that the designer identifies and includes in the design those features and capabilities to support the eventual development of effective response and mitigation actions and strategies at the facility licensing stage which make possible or enhance the capability of the plant licensee to respond to aircraft impacts. The NRC believes that it is reasonable for the designer to include appropriate design features and functional capabilities to support practical responsive actions and strategies that the plant licensee could implement. The plant licensee should not be precluded from using an effective responsive action and strategy, simply because the designer failed to include a well-placed design feature that is necessary for an effective responsive action (e.g. a wall, a water outlet, a control panel).

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) 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 U.S. commercial nuclear power facilities. The NRC has assessed the potential vulnerabilities of operating nuclear power reactors to aircraft impacts, 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 evaluation 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, 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 10 CFR 50.54 rulemaking. Under the proposed 10 CFR 50.54 rulemaking, future license applicants must identify and implement mitigative measures similar to those required for currently operating nuclear power plants.

On March 19, 2007 (72 FR 12705), the Commission published a final rule 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 impact

characteristics. Therefore, the NRC is not applying this final rule to existing operating nuclear power plants.

III. Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications

Based upon consideration of public comments, the NRC has decided that the designs of all nuclear power plants designed and constructed after **[INSERT EFFECTIVE DATE OF FINAL RULE]** must comply with the final aircraft impact rule. The NRC agreed with the majority of commenters who stated that the underlying objectives of the aircraft impact rule would not be fully achieved if a subset of future nuclear power plant applicants - namely, those applicants who reference one of the four existing design certifications – is not required to comply with the aircraft impact rule. This decision stems not only from acknowledgement of the views expressed by a wide range of stakeholders in favor of requiring all future nuclear power plants to meet the requirements of the aircraft impact rule, but also on the NRC's assessment that some of the certified designs may not be built in the U.S., thus making compliance with the rule unnecessary for those designs. Thus, the NRC is requiring that all future nuclear power plants in the U.S. be required to use designs that comply with the aircraft impact rule.

In evaluating this change, the NRC considered regulatory approaches that could be used if a combined license application references one of the four currently approved standard design certifications³ in Appendices A through D of 10 CFR part 52.⁴ The NRC considered

³ Each of the four currently approved design certifications contain a provision, Section IV, "Additional Requirements and Restrictions," which states that the Commission reserves the right to determine in what manner the DCR may not be referenced by an applicant for a construction permit or operating license under 10 CFR part 50. The addition of this provision was a recognition that, although Part 52 allows applications for construction permits and operating licenses to reference a standard design certification, the NRC has not determined how such referencing would actually be implemented. The NRC expects to add similar provisions to future standard design certification rules. Therefore, the final aircraft impact rule does not provide for the possibility of an application for a construction permit or operating license referencing a standard design certification, including one of the four currently approved design certifications.

whether the combined license applicant should be required to perform the assessment of aircraft impacts itself and use the design features and functional capabilities identified as the result of its assessment in the design of their plant, but with no obligation to modify the referenced design certification. A second approach considered by the NRC would require that the four currently approved design certifications be amended by the original design certification applicant to comply with the aircraft impact rule within a short period of time after issuance of the final aircraft impact rule. The NRC also considered a third approach, whereby the NRC would require that the four currently approved design certifications be amended to comply with the aircraft impact rule (without specifying who is responsible for prosecuting the amendment), but only if they are referenced in a combined license application. This approach would also restrict the NRC from issuing a combined license referencing one of the four currently approved design certifications, unless it had been amended to comply with the aircraft impact rule (again, without specifying who is responsible for prosecuting the amendment). The NRC has determined that the third approach, i.e., requiring the four currently approved design certifications to be amended to comply with the final aircraft impact rule, but only if they are referenced in a combined license, should be adopted as the rulemaking approach. The NRC believes that this approach will preserve the level of standardization achieved through certification of these designs, without imposition of undue burdens on any of the original design certification applicants in circumstances where the designs are not likely to be used, as well as leaving to commercial considerations the entity who will actually prosecute the amendment of the design certification to meet the aircraft impact rule. Standardization is thereby enhanced, which is consistent with the Commission's "Policy Statement on Standardization of Nuclear

⁴ The four standard design certifications currently in effect are the U.S. Advanced Boiling Water Reactor (ABWR) design (Appendix A to 10 CFR part 52), the System 80+ design (Appendix B to 10 CFR part 52), the AP600 design (Appendix C to 10 CFR part 52), and the AP1000 design (Appendix D to 10 CFR part 52).

Power Plants” (52 FR 34884; September 15, 1987). Accordingly, the NRC has adopted the third approach in the final aircraft impact rule.

However, the NRC has also decided that if any of the four currently approved design certifications are not referenced in the first 15-year duration of effectiveness under 10 CFR 52.55, then the design must be amended to comply with the aircraft impact rule if it is renewed under the provisions of 10 CFR 52.57 through 10 CFR 52.61. The NRC’s determination in this regard is discussed in IV, “Renewal of an Operating License, Standard Design Certification, Combined License, or Manufacturing License.” The NRC has concluded that it should use the same criteria for evaluating voluntary requests for amendments to existing design certifications as it uses for evaluating new applications for design certifications, to ensure consistency among all new reactor designs.

IV. Renewal of an Operating License, Standard Design Certification, Combined License, or Manufacturing License

This rulemaking does not require updating the assessment of aircraft impacts required by 10 CFR 50.150 as part of an application for either a renewed operating license under 10 CFR part 54, “Requirements for Renewal of Operating Licenses for Nuclear Power Plants,” 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, 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 final rule are outside the scope of any operating license or combined license renewal proceeding under 10 CFR part 54, and neither operating nor combined license holders need to update the

assessment required by 10 CFR 50.150(b) at the license renewal stage.

With regard to design certifications and manufacturing licenses which comply with the aircraft impact rule upon initial issuance or upon amendment, the NRC believes that their renewal review should not include a reassessment of aircraft impacts and possible changes to the design to include new design features and functional capabilities. In the NRC's view, there will not be any significant benefit to requiring applicants for renewal to reassess the design's vulnerability to aircraft impacts absent a change in the aircraft impact characteristics required by the Commission to be used in the aircraft impact assessment. As discussed later in Section V.B, "Description of Beyond-Design-Basis Aircraft Impact," of the Supplementary Information, the final rule requires that the design-specific impact assessment use the Commission-specified aircraft impact characteristics as described in 10 CFR 50.150(b). Because this final rule is intended to provide added protection against the effects of a beyond-design-basis event, the choice of aircraft impact characteristics and the scenario used for this assessment will not be linked to threat assessments or to any evolution of aircraft design. Therefore, there is no real need to require a reassessment at the design certification renewal stage. In addition, mandating a change to the design at the renewal stages would pose an undue burden on those licensees who have referenced the design certification in their license, or used the manufactured reactor at their facility. Under 10 CFR 52.63(a)(3) and 10 CFR 52.171(a)(2), the NRC requires that any modification it imposes on a design certification rule or on the design of a manufactured reactor be applied to all plants referencing the certified design or reactor manufactured under the manufacturing license, except those to which the modification has been rendered technically irrelevant. If the NRC were to require reassessment of the design at renewal, this could result in licensees who have already designed and constructed their plant (or used a manufactured reactor) to modify their plants to come into conformance with the reassessed design. Such modifications are likely to be costly. Given the NRC's determination

that the impact of a large commercial aircraft is a beyond design basis event, the imposition of such costs as the result of reassessment at design certification or manufacturing license renewal does not seem warranted. Moreover, once the design features and functional capabilities for addressing an aircraft impact have been incorporated into a nuclear power plant's design, the goal of this final rule has been achieved in that consideration of aircraft impacts has been factored into the design. In any event, 10 CFR 52.59, which establishes limited finality control over the NRC's renewal of design certifications, does permit the NRC to impose modifications to the design at design certification renewal under certain circumstances (see 10 CFR 52.59(b)(1) through (3)). Accordingly, given that future design certifications and manufacturing licenses must, under the final aircraft impact rule, meet the requirements of the rule upon initial issuance, the NRC has decided that these design certifications and manufacturing licenses need not be required by rule to update the aircraft impact assessment at the time of renewal.

However, upon consideration of these factors in relation to the renewal of the four currently approved design certifications, the NRC has come to the conclusion that if any of these four design certifications have not been updated in the first 15-year duration of effectiveness, then the design must be amended to comply with the aircraft impact rule at the time of renewal under 10 CFR 52.57 through 52.61. As discussed earlier, the NRC has decided that if one of the four currently approved design certifications is referenced in a combined license application and that design certification has not been amended to comply with the aircraft impact rule, then the NRC will not issue the combined license unless the referenced design certification is amended to comply with the aircraft impact rule. The net effect of this regulatory regime is that if any one of the currently approved design certifications has not been updated at the time of renewal, then there will be no combined licenses that reference that design. Accordingly, there will be no nuclear power plant licensees who would be adversely

affected by the mandatory updating requirements of 10 CFR 52.63(a)(3). In this situation, the NRC believes that regulatory consistency, predictability, and efficiency all favor requiring any of the four current design certifications which have not been amended to meet the aircraft impact rule at the time of renewal of the design certification to comply with the aircraft impact rule as part of the renewal process.

The NRC's determination is reflected in the final rule as an amendment to 10 CFR 52.59(a). As revised, paragraph (a) requires the NRC to find, at the first renewal of any of the four currently approved design certifications, that the renewed design (i.e., the design which is being approved for use in the renewed term of the design certification rule) complies with the requirements of the aircraft impact rule.

The NRC has determined, consistent with the intent of 10 CFR 52.59(b), that requiring the renewed design to comply with the aircraft impact rule constitutes a substantial increase in protection to public health and safety. The reasons supporting this determination are set forth in Section XVI, "Backfit Rule," of the Supplementary Information for this final rule. The NRC also believes, based upon public comments from some stakeholders urging that the four design certifications be required to comply with the aircraft impact rule, that there would be a significant adverse public perception if the NRC were to renew the design certifications without requiring that the designs be upgraded to comply with the aircraft impact rule. Finally, the NRC does not believe that adopting this rule requirement on the renewal of the four existing design certifications represents any substantial decrease in the commercial interests of the original applicants for these design certifications (or their successors in interests). In accordance with 10 CFR 52.55, the term of the design certification is 15 years, during which the finality and special backfitting restrictions in 10 CFR 52.63 and 52.83 are effective. By contrast, the NRC established less stringent finality requirements in § 52.59(b) which would apply at the time of design certification renewal. The NRC believes that the regulatory regime governing design

certifications clearly established a higher level of finality protection during the 15-year duration of the design certification, and less stringent protection at each instance of design certification renewal. Furthermore, any commercial interest in stability of the design certification because of the possible adverse impact on referencing licenses does not exist if the design certification has not been referenced during its initial duration of effectiveness. In such a circumstance, the NRC's interest in fostering standardization (i.e., by ensuring that all nuclear power plants referencing the design certification use identical design features and functional capabilities to address aircraft impacts) outweighs any possible commercial expectation that the certified design would not have to be changed. For these reasons, the NRC concludes that the four currently approved design certifications, if they have not already been amended to comply with the aircraft rule, must comply with the rule the first time any of those design certifications are renewed.

V. New Nuclear Power Reactors

A. Introduction.

Under this final rule, relevant applicants for new nuclear power reactors are required to:

- Perform an assessment of the effects on the designed facility of a beyond-design-basis aircraft impact.
- Identify practical design features and functional capabilities for avoiding or mitigating the effects of the aircraft impact and incorporate them into the design of the facility.
- Describe how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

This final rule is based on the premise that it is desirable for future power reactors to avoid or mitigate the effects of an aircraft impact through design features or functional

capabilities that reduce or eliminate the need for operator actions. Because this type of consideration is more effectively done during the development of the design itself, the NRC directs the requirements of this final rule at plant designers.

The NRC does not expect plant designers to demonstrate that design features alone, without operator action or mitigative response activity, will completely avoid or mitigate the effects of the 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 to have the designer implement a rigorous assessment process to ensure that the design process constitutes a reasoned approach for assessing the plant design to identify practical design features and functional capabilities that either minimize the effects of, or mitigate, an 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.

This final rule presents a general description of the aircraft impact characteristics that are required to be used to perform the beyond-design-basis aircraft impact assessment. The assessment must be based on the beyond-design-basis impact of a large, commercial aircraft used for long distance flights in the U.S., 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 NRC will specify for plant designers in a safeguards information (SGI) guidance document more detailed parameters describing the large, commercial aircraft impact that are considered appropriate for use in the required assessment. Although the detailed aircraft impact assessment parameters will be described in an SGI guidance document and will not be publicly available because of their potential value to terrorists, the following description of some of the factors used in selecting the parameters is offered to foster a better understanding of this final rulemaking:

1. *The aircraft used by the terrorists on September 11, 2001.* The NRC 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 final 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 final rule is intended to provide added protection against the effects of a beyond-design-basis event, the choice of aircraft impact characteristics and the scenario used

for this assessment will not be linked to threat assessments or to any evolution of aircraft design. The final rule requires that the design-specific impact assessment use the Commission-specified aircraft impact characteristics as described in 10 CFR 50.150(b) (proposed 10 CFR 52.500(b)). As stated previously, more specific details about the aircraft impact characteristics will be contained in a separate guidance document under SGI controls. Because this guidance document containing more detailed aircraft impact assessment parameters 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 will have access to the guidance document containing these more detailed parameters to perform the assessments required by this final rule.

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 is expected to include the items detailed in the following paragraphs:

1. *Consideration of aircraft impact characteristics.* The assessment must consider the impact of a large, commercial aircraft of the type currently in use for long distance flights in the U.S. as described previously in this document and in 10 CFR 50.150(b). More detailed aircraft impact assessment parameters that are considered appropriate for use 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 capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. Evaluation of the survivability of these critical functions, should consider not only the

key components, but also power supplies, cable runs, and other components that support these functions. The assessment may take credit for the availability of both safety and non-safety equipment. The assessment should evaluate whether the structures containing equipment that provides these critical functions are likely to be affected by the specified large, commercial aircraft impact. Factors to be considered in the assessment 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 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 both the local and global (plant-wide) shock and vibration effects resulting from the aircraft impact.

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

4. *Consideration of potential responsive actions and strategies in identifying design features and functional capabilities.* In determining design features and functional capabilities, the designer is expected to consider the potential responsive actions and strategies in determining what design features and functional capabilities to adopt. After considering potential actions and strategies, the designer may identify practical design features and functional strategies that would facilitate the implementation and/or enhance the effectiveness of such responsive actions and strategies. An objective of the rule is to ensure that practical actions and strategies that the nuclear power plant licensee could use to respond to the effects of an

aircraft impact are not precluded by the design and are available as effective and practical options through inclusion of appropriate design features and functional capabilities.

Regulatory Treatment of the Assessment

The aircraft impact assessment will be subject to inspection 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 is not required to submit the aircraft impact assessment—as opposed to the “description of the identified design features and functional capabilities” required by 10 CFR 50.150(c) (proposed 10 CFR 52.500(c))—to the NRC in its application.

Under the final rule, the NRC will confirm that the information required by 10 CFR 50.150(c) is included in the applicant’s PSAR or FSAR, namely, the description of the design features and functional capabilities identified as a result of the assessment and a description of how those features and capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. The NRC will review the information contained in the application and reach conclusions as to whether the applicant has: (1) adequately described design features and functional capabilities in accordance with the aircraft impact rule; and (2) conducted an assessment reasonably formulated to identify practical design features and functional capabilities to avoid or mitigate, with reduced reliance on operator action, the effects of the aircraft impact.

The NRC’s decision on an application subject to 10 CFR 50.150 will 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. Therefore, the adequacy of the impact assessment may not 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 requirements of the rule with respect to the identification and description of design features and functional capabilities has not been met 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."

Applicants are only required to submit a description of the identified design features and functional capabilities that avoid or mitigate the effects of the aircraft impact in their PSAR or FSAR, together with a description of how the identified design features and functional capabilities comply with the rule's requirements. Applicants subject to the aircraft impact rule must make the complete aircraft impact assessment available for NRC inspection at the applicants' offices or their contractors' offices, upon NRC request in accordance with 10 CFR 50.70, "Inspections," 10 CFR 50.71, "Maintenance of records, making of reports," and Section 161.c of the Atomic Energy Act of 1954, as amended. 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 50.150 will be that information contained in the applicant's FSAR. However, if the NRC believes, during the course of its review of the application, that the application contains incomplete or insufficient descriptions of the design features and functional capabilities included in the design, or insufficient discussions of how these features and

capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator action, the effects of the aircraft impact, then the NRC may request additional information or may review the assessment prior to issuance of the design certification, approval, or license, as applicable.

The NRC will confirm that the impact assessment was performed consistent with the regulatory requirements, but, consistent with the discussion above, the NRC's confirmation will proceed independently of the NRC's licensing or approval action on the relevant application. The NRC may take appropriate enforcement action for any violations of applicable NRC requirements, including, but not limited to, 10 CFR 50.150, "Aircraft impact assessment;" 10 CFR 50.5 and 10 CFR 52.4, "Deliberate misconduct;" and 10 CFR 50.9 and 10 CFR 52.6, "Completeness and accuracy of information." A failure to perform the assessment will 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 practical design features or functional capabilities, or to justify non-adoption of practical design features or functional capabilities could be considered a violation of the rule.

For design certifications, design approvals, and manufacturing license which are subject to and/or have been determined by the NRC to be in compliance with the aircraft impact rule, issue resolution (in accordance with the applicable NRC regulations and law) will be accorded to the aircraft impact assessment, the descriptions of the design features and functional capabilities required to be included in the application, and the description of how the identified design features and functional capabilities meet the requirements of this final rule. Furthermore, the NRC has concluded in this final rulemaking that issue resolution also extends to the exclusion of design features and functional capabilities which have not been included in the facility design. This position represents a change from the NRC's proposed position as presented in the proposed rule's statement of consideration (see 72 FR 56292, third column

(October 3, 2007)). The NRC's changed position on this matter stems from a review of the issue resolution provision in design certification rulemaking. Under the "Issue Resolution" section for each of the four current design certifications, the NRC included the following statement: "A conclusion that a matter is resolved includes the finding that additional or alternative structures, systems, and components, design features, design criteria, testing, analyses, acceptance criteria or justification are not necessary for the [design which is certified]." 10 CFR part 52, Appendices A through D, paragraph IV.A. There is nothing exceptional about the technical requirements in the aircraft impact rule which suggests that this provision on issue resolution should not also apply to matters addressed by the aircraft impact rule. Accordingly, as part of this final rulemaking the NRC adopts a different position on the scope of issue resolution with respect to excluded design features and functional capabilities.

Once the applicant completes the impact assessment and identifies in the FSAR the design features and functional capabilities that it has incorporated into its design, the goal of this final rule has been achieved. Accordingly, the final rule does not require the impact assessment to be updated by either: (1) an operating license holder; (2) a 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. However, if a permit holder, licensee, approval holder, or design certification applicant makes a change to the information required to be included in their PSAR or FSAR, then they will be required to consider the effect of the change on the original assessment required by 10 CFR 50.150(b) and amend the information required to be included in the PSAR or FSAR. These requirements are

discussed in more detail later in this section. Also, a construction permit holder will need to update its initial assessment when it is preparing to submit its operating license application because it is only at the operating license stage that the applicant will be seeking NRC approval of its final design. No applicant or licensee will be required to update the assessment in an application for renewal under either 10 CFR 52.57, 10 CFR 52.107, 10 CFR 52.177 or 10 CFR part 54.

Record Retention Requirements

The provisions of 10 CFR 50.71(c) require that records that are required by the regulations in 10 CFR parts 50 or 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 10 CFR 50.150(b) (proposed 10 CFR 52.500(b)) requires the performance of the aircraft impact assessment, it falls under the category of “records that are required by the regulations” and therefore, the licensee will 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 10 CFR 50.150 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 will require applicants and licensees to retain the assessment required by 10 CFR 50.150(b) throughout the pendency of the application and for the term of the certification or license (including any period of renewal).

For all applicants, the supporting documentation retained onsite should describe the methodology used in performing the assessment, including the identification and evaluation of the practicality of potential features and capabilities for inclusion in the design. The documentation should also include the features and capabilities that were considered but

rejected, along with the basis for their rejection.

Identification of Design Features and Functional Capabilities

The final rule requires designers of new facilities to describe how the design features and functional capabilities identified in performance of the aircraft impact assessment avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. Plant structures critical to maintaining facility safety functions should be designed, if practical, 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 (core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity) by addressing equipment survivability following the entry of aircraft parts and jet fuel. Key safety functions should be accomplished notwithstanding the resulting internal damage 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 final rule applies to newly designed facilities before construction of the facility, the Commission expects that improvements can be made in the plant's design that may be even more effective than operator actions credited in operating plants. Thus, these designs should have reduced reliance, relative to current operating plants, on operator actions.

This final rule requires applicants to describe how the design features and functional capabilities avoid or mitigate, "to the extent practical" and with reduced reliance on operator actions, the effects of the aircraft impact. The NRC intends the term "to the extent practical" to

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

The final rule uses the term "practical" rather than the proposed rule's term "practicable" to describe the design features and functional capabilities that are to be identified for inclusion in the facility design. "Practicable" means "capable of being done," or something that can be put into effect. By contrast, "practical" refers to something that is also sensible and worthwhile. See *Haueser v. Department of Law, Government of Guam*, 97 F.3d 1152, 1160, fn.4 (9th Cir. 1996). The NRC intends that designers include in their designs only those design features and functional capabilities that are reasonable, efficient and workable (see *Random House College Dictionary*, Revised Edition (1980), distinguishing between "practicable" and "practical").

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 assessment to consider the practicality of such design features and functional capabilities and of possible improvements in these and other features and capabilities for addressing aircraft impacts.

Control of PSAR or FSAR Information

Design features or functional capabilities credited for avoiding or mitigating the effects of an aircraft impact should 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 previously mentioned categories apply. For example, a design feature added specifically to avoid or mitigate the effects of an aircraft impact will be controlled only by requirements in 10 CFR 50.150(d) (proposed 10 CFR 52.502) added in this final rule or requirements that the NRC expects to add to future design certifications that will be subject to 10 CFR 50.150 (proposed 10 CFR 52.500). A safety-related structure credited in the aircraft impact assessment as a design feature will 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 requirements for control of features to address aircraft impacts.

For all applicants and licensees subject to 10 CFR 50.150, control of changes to any

design features or functional capabilities credited for avoiding or mitigating the effects of an aircraft impact will be governed by the requirements in a new paragraph (d), "Control of changes," of 10 CFR 50.150. For construction permits which are subject to 10 CFR 50.150, paragraph (d)(1) requires that, if the permit holder changes the information required by 10 CFR 50.34(a)(13) to be included in the PSAR, then the permit holder must consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(a)(13) to be included in the PSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. Because this final rule addresses 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 and capabilities that were applied during the original evaluation of those design features and functional capabilities.

Paragraph (d)(2) of 10 CFR 50.150 provides that, for operating licenses which are subject to the aircraft impact rule (*i.e.*, operating licenses for which the underlying construction permits are issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**), if the licensee changes the information required by 10 CFR 50.34(b)(12) to be included in the FSAR, then the licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(b)(12) to be included in FSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

Paragraph (d)(3) of 10 CFR 50.150 governs changes to a design feature or functional capability described in a standard design certification. Such changes may not be made generically except by notice and comment rulemaking (see 10 CFR 52.63, "Finality of standard

design certifications,” paragraphs (a)(1) and (a)(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 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 Supplementary Information 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, any applicant for an amendment to a design certification is also subject to the records management requirement. In the case of amendment requests submitted by someone other than the original applicant, the NRC would need to develop appropriate rule language to reflect the record management responsibilities for information (including SGI and proprietary information) that was developed by applicants other than the original applicant.

For combined license holders subject to 10 CFR 50.150(b)(1)(i) (i.e., a licensee whose application does not reference a standard design certification, standard design approval, or manufactured reactor), 10 CFR 50.150(d)(4)(i) states that if the licensee changes the information required by 10 CFR 52.79(a)(47) to be included in the FSAR, then the licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 52.79(a)(47) to be included in the FSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the

aircraft impact.

Paragraph (d)(4)(ii) of 10 CFR 50.150 governs combined license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii) and states that proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the referenced standard design certification are governed by the change control requirements in the applicable design certification rule. The NRC expects to add a new change control provision to future design certification rules subject to 10 CFR 50.150 (including amendments to any of the four existing design certifications) to govern combined license applicants and holders referencing the design certification that request a departure from the design features or functional capabilities in the referenced design certification. The new change control provision will require that, if the applicant or 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 applicant or licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b). The applicant or licensee must also describe in a change to the FSAR (i.e., a plant-specific departure from the generic design control document), how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. An applicant or licensee's 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 or capabilities included in the certified design 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 50.54(hh).

Paragraph (d)(4)(iii) of 10 CFR 50.150 governs combined license applicants or holders

which are not subject to 10 CFR 50.150(b) but reference a manufactured reactor which is subject to 10 CFR 50.150(b). For such applicants and licensees, 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.

Generic changes for manufacturing licenses which are subject to 10 CFR 51.150(b) are addressed in 10 CFR 50.150(d)(5)(i), which states that generic changes to the information required by 10 CFR 52.157(f)(32) to be included in the FSAR are governed by the applicable requirements of 10 CFR 52.171. 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 or functional capabilities 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."

Paragraph (d)(5)(ii) of 10 CFR 50.150 governs manufacturing license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii). Similar to a combined license application, in a manufacturing license application referencing a design certification, departures from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the referenced

standard design certification are governed by the change control requirements in the applicable design certification rule.

There are no provisions in 10 CFR 50.150(d) governing changes to a standard design approval because a design feature or functional capability 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 10 CFR 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 or functional capability described in a standard design approval will 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 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 a portion of a nuclear power reactor, any applicant referencing that design approval will have to separately comply with the requirements of 10 CFR 50.150 for any portion of the design not addressed in the design approval issued by the NRC.

VI. Responses to Public Comments

A. Overview of Public Comments.

The public comment period for the proposed rule closed on December 17, 2007. The NRC received 32 comment letters on the proposed rule. Of those comments, 31 commenters were in favor of requiring aircraft impact assessments on nuclear power plants; one commenter

was against requiring an aircraft impact assessment. Several commenters also endorsed other commenters' views, where some provided comments in addition to those they endorsed. No commenters supported the rule exactly as proposed.

Due to the large number of comments received and the length of the responses provided, this section of the final rule only provides a summary of the categories of comments with a general description of the resolution of those comments. The detailed description of the comments and the NRC responses are available electronically at the NRC's electronic Reading Room, ADAMS Accession No. ML080290007.

The proposed aircraft impact rule was published in advance of publication of draft NRC guidance for implementing the rule. The NRC indicated in the proposed rule that commenters on the proposed rule need not await the publication of the draft guidance, to comment meaningfully on the proposed rule (see 72 FR 56298 (October 3, 2007)). The NRC only received one comment suggesting that either the proposed rule language or information on the aircraft impact characteristics which was provided in the Supplementary Information for the proposed rule prevented or significantly impeded the commenter from understanding the proposed rule or commenting on it. Moreover, as described in the following discussion, the NRC received many comments effectively (if not explicitly) directed at one or more aspects of the aircraft impact characteristics. Accordingly, the NRC concludes that the NRC provided sufficient information on the proposed aircraft impact rule to allow the public a meaningful opportunity to comment on the proposed rule's requirements.

B. Responses to Specific Requests for Comments.

In Section VIII of the Supplementary Information for the proposed rule, the NRC posed eight questions for which it solicited stakeholder comments. In the following paragraphs, these questions are restated, comments received from stakeholders are summarized, and the NRC resolution of the public comments is presented.

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 to 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.

Commenters' Response: The three industry commenters who addressed this question (Nuclear Energy Institute (NEI), Morgan Lewis, and AREVA Nuclear Power (AREVA NP)) indicated that the impact assessment should not be included with the application. NEI indicated that a description [of the assessment] and the evaluation under 10 CFR 52.500(c) need be included. In a separate comment, NEI expressed its view that the submittal on aircraft impacts would be classified as a safeguards information document. A detailed discussion of the commenters' responses is provided at ADAMS Accession No. ML080290007.

NRC Response: The final rule does not require that the assessment of aircraft impacts be included in the PSAR or FSAR or otherwise submitted as part of the application for a construction permit, operating license, standard design certification, standard design approval, combined license, or manufacturing license. However, 10 CFR 50.150(c) does require that a description of the design features and functional capabilities credited by the applicant to avoid

or mitigate the effects of the aircraft impact be included in the PSAR or FSAR submitted with the relevant application. In addition, the PSAR or FSAR must contain a description of how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. The aircraft impact assessment will be subject to inspection 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. 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 50.150 will be that information contained in the applicant's PSAR or FSAR. For these reasons, the final rule does not require applicants to submit the aircraft impact assessment to the NRC.

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.

Commenters' Response: Three industry commenters (NEI, Morgan Lewis, and AREVA

NP) opposed the use of 10 CFR part 100 dose limits as acceptance criteria for the aircraft impact rule. NEI and Morgan Lewis asserted that the use of 10 CFR part 100 dose limits would imply that the aircraft impact is a design basis event, inasmuch as 10 CFR part 100 dose limits are used to evaluate the acceptability of design features addressing design basis events. Use of 10 CFR part 100 dose limits, therefore, could be misinterpreted and result in unnecessary expenditure of industry and NRC resources. As an alternative, NEI suggested that the NRC adopt the following functional acceptance criteria: (1) demonstrate that the reactor core remains cooled or the containment remains intact; and (2) demonstrate that spent fuel cooling or spent fuel pool integrity is maintained.

NRC Response: The NRC agrees, in part, with the commenters' recommendations for alternative acceptance criteria. The NRC agrees that 10 CFR part 100 dose limits should not be used for the purpose of this rule, and that the concepts of maintaining core cooling, containment integrity, spent fuel cooling and spent fuel pool integrity must be addressed in the assessment; however, the NRC does not view the maintenance of these functions as hard and fast acceptance criteria.

The NRC decided not to adopt an additional acceptance criterion based on 10 CFR part 100 dose limits in the final rule for the reasons outlined by the commenters, namely, that the 10 CFR part 100 limits are limits that the NRC uses to judge compliance with design basis requirements. Therefore, the acceptance criterion contained in the final rule by which the NRC may judge the required assessment continues to be the practicality criterion addressed in 10 CFR 50.150(b) and (c), that is, that the applicant must describe how the design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. In addition, the NRC is making it clearer in the final rule that the assessment must address the effects of the aircraft impact on the key safety functions of core cooling capability, containment integrity, spent fuel cooling

capability, and spent fuel pool integrity.

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.

Commenters' Response: All the industry commenters (NEI, Morgan Lewis, and AREVA NP) who commented on this question stated that the existing NRC records retention requirements are sufficient. AREVA NP also stated that the records retention requirements should apply to design certification holders for the time that the design certification is in effect.

NRC Response: The NRC agrees with the commenters. No changes were made to the proposed rule's record retention requirements in the final rule. The final rule relies on the general record retention requirements in 10 CFR 50.71(c) for retention of the assessment for combined license and manufacturing license holders subject to 10 CFR 50.150. The NRC intends to similarly rely on general design certification rule provisions for retention of the assessment required by proposed 10 CFR 50.150 for design certification applicants and combined license and manufacturing license holders that reference a design certification.

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 another qualified entity) 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.

Commenters' Response: One industry commenter (NEI) stated that voluntary requests to amend existing design certifications to address aircraft impacts should be held to the same standard as new design certification applications, because to do otherwise would introduce inconsistency into the regulatory process. One industry commenter (Morgan Lewis) agreed with the NEI position, adding that if the holder of an existing design certification does not voluntarily comply with the rule, then combined license applicants that reference that design certification will still be required to comply with the proposed 10 CFR 73.55 amendment, and these applicants would not receive the benefits of any design changes in response to the proposed rule on aircraft impacts. As encouraged by the proposed rule, some commenters noted that reactor vendors with existing design certifications may voluntarily request the NRC to amend the design certifications to address aircraft impacts. Some commenters stated that the NRC should use the same criteria for evaluating such requests for amendments to existing design certifications as it uses for evaluating new applications for design certifications. Some commenters also stated that combined license applicants that reference the amendment to a design certification that voluntarily complies with the aircraft impact rule should be treated the same as a combined license applicant that references a new design certification that is required to comply with the aircraft impact rule.

NRC Response: The NRC agrees with the commenters that the NRC should use the same criteria for evaluating voluntary requests for amendments to currently approved design

certifications as it uses for evaluating new applications for design certifications. To ensure consistency among all new reactor designs, the NRC must apply the same criteria to voluntary requests for amendments to existing design certifications as it uses for evaluating new applications for design certifications or applications for COLs that reference a design certification that has not been amended to address the aircraft impact rule.

The NRC notes that, in a change in position from that described in the proposed aircraft impact rule, the NRC has determined in the final aircraft impact rule that the four currently approved standard design certifications in Appendices A through D to 10 CFR Part 52 should be required to comply with the final aircraft impact rule, but only if one of those design certifications is referenced in a combined license, or upon renewal if, at the time of renewal, the design certification has not been amended to comply with the aircraft impact rule. The reasons for this change in position are set forth in Section III, "Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications," of the Supplementary Information of this document.

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.

Commenters' Response: One industry commenter (NEI) recommended that future applicants for new construction permits under 10 CFR part 50 should be required to meet the rule, but that current holders of construction permits, including those whose plants are essentially complete, should not be required to comply with the rule. The commenter suggested that plants with an existing construction permit and plants where construction is essentially complete should be subject to the same requirements as operating plants, which are required to have mitigation actions for large area fires and explosions. To require otherwise would be impractical and result in a financial burden in changing a design that is essentially built.

NRC Response: The NRC agrees with the commenter that future applicants for new construction permits under 10 CFR part 50 should be required to meet the rule, but that current holders of construction permits should not be required to comply with the rule. The NRC is making the final rule applicable to 10 CFR part 50 license applicants as well as applicants under 10 CFR part 52 to maintain consistency in the technical requirements that are applied to new applicants under 10 CFR parts 50 and 52. The final rule requires both new power reactor construction permit applicants and operating license applicants to perform the required assessment and include the description of the identified design features and functional capabilities in their applications. The final rule is being applied to applicants at both construction permit and operating license stage because it is not until the operating license stage that the applicant is required to provide the NRC with its final design. The NRC can issue a construction permit based on preliminary design information. Therefore, the NRC believes it is necessary to require applicants to perform the aircraft impact assessment at both stages and

to include the required information in both applications based on the level of design information available at the time of each application.

In making these additions, the NRC is making it clear that the requirements are not meant to apply to operating license applications for which construction permits were issued before the effective date of this final rule. This is because existing construction permits are likely to involve designs which are essentially complete and may involve sites where construction has already taken place. Applying the final rule to operating license applications for which there are existing construction permits could result in a financial burden to change a design for a plant that is partially constructed. Such a financial burden is not justifiable in light of the fact that the NRC considers the events to which the aircraft impact rule is directed to be beyond-design-basis events and compliance with the rule is not needed for adequate protection to public health and safety or common defense and security. Moreover, such operating license applicants would be required to comply with the requirements in proposed 10 CFR 50.54(hh) to identify actions to mitigate the effects of large fires and explosions, including those caused by aircraft impacts. For these reasons, the NRC is not requiring operating license applicants with an existing construction permit to comply with the final rule.

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 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.

Commenters' Response: One industry commenter (NEI) stated that the requirements should be placed in 10 CFR part 52 because the assessment relates to a beyond-design-basis event and is intended to apply to design certifications. One industry commenter (Morgan Lewis) generally agreed with NEI, but stated if the aircraft impact rule's requirements are to be imposed on future 10 CFR part 50 construction permit applicants, then the requirements should be included in 10 CFR part 50, consistent with the general principle established in the recent 10 CFR part 52 rulemaking (72 FR 49352; August 28, 2007).

NRC Response: The NRC is relocating the aircraft impact requirements from 10 CFR 52.500 as proposed to new section 10 CFR 50.150. Similarly, requirements for the control of changes to FSAR information is relocated from 10 CFR 52.502 as proposed to 10 CFR 50.150(d). These sections were relocated to maintain the general principle that the NRC established in the comprehensive 10 CFR part 52 rulemaking, that is, to maintain the technical requirements in 10 CFR part 50 for plants licensed under 10 CFR part 52. Furthermore, because the final rule is also applicable to applicants for new construction permits and operating licenses under 10 CFR part 50, the relocation of the aircraft impact assessment requirements to 10 CFR part 50 is necessary.

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.

Commenters' Response: One industry commenter (NEI) stated that the proposed rule's requirements should not be applied to future applicants for design approvals and manufacturing licenses, but provided no rationale for its recommendation. One industry commenter (Morgan Lewis) indicated that this issue is difficult to evaluate at this time, and it would be better to defer consideration of this issue, inasmuch as the NRC could later amend the rule as necessary.

NRC Response: The NRC disagrees with the commenters because the scope of and reviews for design approvals and manufacturing licenses are essentially the same as for design certifications. The NRC sees no benefit in deferring the decision on applicability to design approvals and manufacturing licenses to a later time. Therefore, the final rule applies to future design approval or manufacturing license applicants.

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.

Commenters' Response: Two industry commenters (NEI and Morgan Lewis) argued that the scope of the aircraft impact assessment for combined license applicants should be the same scope as the assessment required for a new design certification. This would ensure consistency among all combined license applicants regardless of whether they reference or not reference a design certification, and would cover the majority of the portion of the plant design which is considered most vulnerable to an aircraft impact.

NRC Response: The NRC disagrees with the commenters. The NRC believes that the greatest benefit from implementation of this final rule will be achieved by having each applicant consider as much of the facility design as possible when it is performing the aircraft impact assessment. Design certification, design approval, and manufactured reactor applicants will only logically be able to consider that part of the facility design within the scope of the certification, approval, or license. However, combined license applicants that do not reference a design certification, design approval, or manufactured reactor will have the entire facility design available for consideration. This means, as a practical matter, that the scope of the overall plant design which is subject to the aircraft impact rule's requirements may be greater for a "custom"

combined license applicant who does not reference a design certification, design approval, or manufactured reactor. The NRC believes it is preferable to benefit from this broader review for those combined license applicants that must perform the aircraft impact assessment than it is to limit their review to the scope of the design that would otherwise be considered by, for example, a design certification applicant. The NRC believes its approach is preferable to that suggested by the commenters even though it results in combined license applicants that reference a certified design, design approval, or manufactured reactor assessing a different scope of the facility design than a “custom” combined license applicant. The NRC believes that, as a result of such an approach, combined license holders that reference a certified design, design approval, or manufactured reactor will likely need to do more work to comply with the proposed requirements for licensees to develop and adopt mitigative strategies to cope with large fires and explosions in proposed 10 CFR 50.53(hh) than will a “custom” combined license holder that has assessed the entire facility at the design stage in accordance with this final rule. For these reasons, the NRC has not made any changes to the assessment requirements for combined license applicants in the final rule.

C. Responses to Remaining Comments.

The comments were separated into 11 categories based on their relevance to particular topics. The comments and responses contained in the first category are summarized in Section VI.B of the Supplementary Information of this document. The comments and responses contained in the second through the eleventh category are summarized in the following paragraphs.

The second category addresses the overall need to address aircraft impacts. Some commenters supported, while others opposed, requiring an aircraft impact assessment. No changes were made to the proposed rule as a result of these comments. The NRC believes that requiring new plant designers to perform this assessment will result in new plants having

additional inherent protection against the effects of an aircraft impact.

The third category addresses the scope of applicants and licensees that the rule is applicable to. Some commenters suggested that the rule should also apply to all currently operating nuclear power reactors, reactors with spent fuel in onsite pool storage structures, combined license applicants (regardless of the design being referenced), and currently approved design certifications. Other commenters suggested not applying the rule to currently operating reactors. The final rule does not apply to currently operating reactors but does apply to all applicants for new nuclear power reactors including the four currently approved design certifications, but only if they are referenced in a combined license application.

The fourth category addresses adequate protection and consideration of aircraft impacts as a beyond-design-basis event. Some commenters agreed that aircraft impacts should be treated as a beyond-design-basis event, while others opposed the treatment of aircraft impacts as a beyond-design-basis event. Others suggested that NRC does not have the statutory authority to require consideration of the effects of an action in the nature of an attack by an enemy of the U.S. The NRC did not make any change to the proposed rule's treatment of these issues. The final rule continues to identify an aircraft impact as a beyond-design-basis event.

The fifth category addresses the Commission's specified aircraft characteristics. Some commenters suggested that the general description of aircraft characteristics is adequate, whereas others suggested that the proposed aircraft characteristics are not adequate. The description of the aircraft characteristics has not changed in the final rule.

The sixth category addresses the aircraft impact assessment. Some commenters suggested that the assessment needs to consider all real consequences of the aircraft impact, while other commenters suggested that the assessment should use standardized and validated models and be based on practical and realistic criteria, assumptions, and methodologies. The assessment requirements are not changed from the proposed rule. The final rule requires the

assessment to be rigorous and performed using realistic assumptions.

The seventh category addresses the evaluation of design features, functional capabilities, and strategies as described in the proposed rule. Some commenters suggested providing acceptance criteria in the rule, clarifying the NRC's intent in using the term "avoid," requiring features which would prevent the impact from occurring, preventing the applicant from implementing design tradeoffs which would negatively impact safety, and providing additional guidance on the intent of the terms "to the extent practical" and "reduced reliance on operator actions." The final rule does not provide explicit acceptance criteria to judge the results of the assessment, but does provide additional clarification on the intent of the terms "avoid," "to the extent practical," and "reduced reliance on operator actions."

The eighth category addresses issue resolution and regulatory implementation issues. Some commenters suggested that the final rule should clarify that the assessment and evaluation are part of the design certification rulemaking and provide issue resolution for subsequent combined license applicants, and that contentions on their adequacy will not be entertained in individual combined license proceedings. Other commenters suggested that the aircraft impact assessment need not be updated as part of a license renewal application, and others suggested that the design features incorporated into the design under a design certification are not part of the plant's physical security requirements and, therefore, not subject to review at the combined license stage. The final rule reflects that the NRC will review the information required to be submitted under 10 CFR 50.150(c) and will accord issue resolution. The NRC agreed, in general, with the comment that the aircraft impact assessment need not be updated as part of a license renewal application, with one exception. The NRC has added provisions in the final rule that have the effect of requiring each of the four currently approved design certifications to comply with the aircraft impact rule at the time of renewal, if that design has not been previously amended to comply with the aircraft impact rule. The NRC agrees that

the design features selected by the designer and incorporated into a design certification are not subject to review at the combined license stage from the standpoint of compliance with the aircraft impact rule. However, the NRC disagrees with the view that design features incorporated into a design certification as a result of the aircraft impact rule would not be subject to a physical security review under 10 CFR part 73 during a combined license application proceeding where the design certification is referenced.

The ninth category addresses protection of safeguards and other sensitive information. Some commenters suggested that the aircraft characteristics should not be provided in the rule nor should details of the design features that protect against aircraft impacts be described in licensing applications. One commenter suggested that the proposed rule's failure to provide detailed aircraft parameters prevents meaningful involvement from the public and experts in industry and academia, and that the relevant September 11, 2001 aircraft parameters have been previously published in publicly available government documents. The NRC maintains the position from the proposed rule that the general information on aircraft characteristics provided in the rule is sufficient for the purposes of public comment, and no changes were made to the final rule as a result of these comments.

The tenth category addresses compliance with the National Environmental Policy Act. Some commenters suggested that the NRC should prepare an environmental impact statement because the rule is a major federal action significantly affecting the environment and should consider alternatives to the proposed rule. The final rule did not change as a result of these comments because the rulemaking does not constitute a "major federal action significantly affecting the quality of the human environment."

The eleventh category addresses other comments that did not logically fit into the other categories. Commenters suggested considering other threats, not permitting siting of new reactors within 5 miles of an airport, and that the aircraft impact assessment is an aging-related

matter. The final rule did not change as a result of these comments.

VII. Section-by-Section Analysis

§ 50.8 Information collection requirements: OMB approval

This section, which lists all information collections in 10 CFR part 50 which have been approved by the Office of Management and Budget (OMB), is revised by adding a reference to 10 CFR 50.150, the aircraft impact rule. As discussed below, under the Paperwork Reduction Act Statement, the OMB has approved the information collection and reporting requirements in the final aircraft impact rule. No specific requirement or prohibition is imposed on applicants or licensees in this section.

§ 50.34 Contents of construction permit and operating license applications; technical information

This section describes the technical information which must be provided in applications for construction permits and operating licenses subject to 10 CFR 50.150. New paragraphs (a)(13) and (b)(12) require each application for a construction permit and operating license subject to the aircraft impact rule to include the information required to be submitted to the NRC by 10 CFR 50.150.

Section 50.150 Aircraft impact assessment

Section 50.150 is a new requirement for assessing a large, commercial aircraft impact at nuclear power plants and incorporating design features and functional capabilities to avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of such aircraft impacts.

Paragraph (a) identifies the types of licenses, certifications, and regulatory approvals for

which applicants or holders must comply with this section's requirements. The aircraft impact rule was designated as 10 CFR 52.500 at the proposed rule stage, but has been redesignated as 10 CFR 50.150, consistent with the NRC's intention that this technical requirement applies to applicants for licenses under 10 CFR part 50 as well as applicants for licenses and regulatory approvals under 10 CFR part 52.

The aircraft impact rule applies to, and must be complied with, by all: (1) applicants for or holders of construction permits under 10 CFR part 50 issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**; (2) applicants for or holders of operating licenses for which the underlying construction permits were issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**; (3) design certifications issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**; (4) applicants for or holders of combined licenses, except as discussed further in this section; (5) applicants for or holders of manufacturing licenses, except as discussed further in this section; and (6) applicants for design approvals issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**. In addition, the aircraft impact rule applies to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license.

In most cases, paragraph (a) indicates that the requirements of 10 CFR 50.150 apply to "applicants for or holders of" a permit or license. This is because the requirements in 10 CFR 50.150(b) apply to applicants for licenses (as well as other applicants), whereas the requirements for change control in 10 CFR 50.150(d) apply to applicants for and holders of licenses.

Applicants for operating licenses whose underlying construction permits were issued before the aircraft impact rule need not (but may voluntarily choose to) comply with the rule. The NRC notes that the applicability of the aircraft impact rule is dependent upon the date of the NRC's final action on an application, and not the date of filing of the application. Thus, a

combined license issued after the effective date of the final 10 CFR 50.150 rule will be subject to the requirements of the rule, even if its application was filed before the effective date of the final 10 CFR 50.150 rule.

Certain combined license applicants need not perform a plant-specific assessment to comply with the aircraft impact rule. If the combined license application references a design certification, design approval, or manufactured reactor which complies (or will comply, upon amendment of the design certification, in accordance with provisions of the rule which are discussed below) with the assessment requirements of the aircraft impact rule, then the COL applicant need not perform an assessment to comply with the aircraft impact rule. This means, as a practical matter, that the scope of the overall plant design which is subject to the aircraft impact rule's requirements may be greater for a "custom" combined license applicant who does not reference a design certification, design approval, or manufactured reactor which complies (or will comply) with the aircraft impact rule.

Analogous to the combined license applicant, a manufacturing license applicant who does not reference a standard design certification or standard design approval which has complied with the aircraft impact rule, must comply with the aircraft impact rule.

The four currently approved design certifications are not required to comply with the aircraft impact rule so long as the certification is not referenced in a license issued by the NRC. However, if one of the four currently approved the design certification is referenced in a combined license application, then the design certification must be amended to comply with the aircraft impact rule no later than the time that the combined license referencing the (amended) design certification is issued. The original design certification applicant may, at any time, voluntarily request an amendment to the design certification rule to recertify the design certification as complying with the aircraft impact rule. The NRC notes that persons or entities other than the original design certification applicant may also request such an amendment of

one of the four currently approved design certifications. However, such an application must provide the full set of information required by the aircraft impact rule, including, as necessary, information which substitutes for the proprietary and safeguards information provided in the original design certification proceeding, but which is not available for use in the design certification amendment proceeding. The amendment of the design certification to reflect compliance with the aircraft impact rule will be accomplished through rulemaking.

Paragraph (b) contains the key technical provisions of the aircraft impact rule. Paragraph (b) is divided into two paragraphs, (b)(1) and (b)(2), to help readers distinguish between the assessment of aircraft impact, and the characteristics of the aircraft impact that must be used by the facility designer in performing the assessment described in paragraph (b)(1).

Paragraph (b)(1) addresses the assessment of aircraft impact, and is itself subdivided into three paragraphs. This subdivision reflects the NRC's final decision that all combined licenses, construction permits, operating licenses, standard design certifications, standard design approvals, and manufacturing licenses issued after the effective date of the final rule must either comply with the rule, or reference a design certification, design approval, or reactor manufactured under a manufacturing license complying with the rule, as applicable.

Paragraph (b)(1)(i) requires each applicant, other than an applicant for a combined license or a manufacturing license referencing a standard design certification, standard design approval, or reactor manufactured under a manufacturing license, or a design for which a design certification application has been docketed but not granted, as applicable, to perform a design-specific assessment of the effects on the designed facility of the impact of a large, commercial aircraft. The applicants covered by this paragraph include combined license and manufacturing license applicants who chose not to reference a standard design certification, but instead use a "custom" design. Also covered by this paragraph are combined license applicants

that choose to reference a design for which a design certification application has been docketed but not granted. This is an acknowledgement that, under 10 CFR 52.55(c), an applicant for a combined license may, at its own risk, reference in its application a design for which a design certification application has been docketed but not granted. The applicant's assessment must identify and incorporate into the design of the facility those design features and functional capabilities that avoid or mitigate—to the extent practical, and with reduced reliance on operator actions—the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.

Paragraph (b)(1)(ii) applies to applicants for combined licenses and manufacturing licenses that choose to reference a design certification, including a combined license applicant who references one of the four currently approved design certifications. This paragraph requires such applicants to reference in their applications either:

1. A design certification which meets the requirements of the aircraft impact rule (i.e., a new design certification issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**, or one of the four currently approved design certifications in part 52, appendices A through D, which has been amended in a final rulemaking to reflect compliance with the aircraft impact rule);
2. An application for an amendment to one of the four currently approved design certifications in part 52, appendices A through D, where the design is being amended to comply with the requirements of the aircraft impact rule; or
3. An application for a new design certification which has been docketed but not granted.

As a result of these provisions, every future nuclear power plant will meet the aircraft impact rule, which is the NRC's key objective in adopting this final aircraft impact rule.

The NRC notes that § 50.150(b)(1)(ii) of the final rule affords flexibility to the combined

license applicant who wishes to use one of the four currently approved design certifications, as well as to the original applicant (or another qualified entity) of the referenced design certification.

It also does not disturb or otherwise favor any particular commercial arrangement that the license applicant may have with the original applicant of the referenced design certification or with any other entity seeking to utilize one of the four currently approved design certifications.

This is because the rule's requirements have two separate directives: one to the license applicant, and the other to the NRC itself. The first directive, in 10 CFR 50.150(b)(1)(ii), requires the license applicant to submit an application referencing one of the following: (1) a design certification which complies with the final aircraft impact rule; (2) an application for an amendment to one of the four currently approved design certifications, where the design is being amended to comply with the aircraft impact rule; or (3) a docketed but not yet issued design certification which, by virtue of 10 CFR 50.150(b)(1)(i), must comply with the aircraft impact rule. By contrast, the second directive, in 10 CFR 50.150(b)(1)(iii), is addressed at the NRC and limits the circumstances under which the NRC may issue a combined license, construction permit, operating license, or manufacturing license. The final rule does not require any particular sequence or timing of licensing application and design certification rulemaking – except that the combined license may only be issued if the license itself references a design certification that meets the requirements of the aircraft impact rule. Nor does the final aircraft impact rule designate one particular class of entities to comply with the aircraft impact rule.

Thus, as only one of many possible paths, it would be possible for a combined license applicant to submit an application referencing an amendment to one of the four currently approved designs, where the amendment is for the purpose of complying with the aircraft impact rule.

The request for amendment to the currently approved design certification could be submitted by the combined license applicant, the original design certification applicant (or another qualified entity), or by another entity with the capability to supply all of the necessary information for the

NRC to evaluate the amendment request. Upon NRC's review and approval of the design certification amendment and assuming all other necessary requirements were met, the combined license could be issued.

Paragraph (b)(1)(iii) provides that the NRC will issue a combined license, construction permit, operating license, or manufacturing license under one of two situations. The NRC may issue the license if it finds that the design described in the license complies with the requirements of the aircraft impact rule, i.e., the necessary assessment has been performed and the design incorporates design features and functional capabilities as required by the aircraft impact rule. Alternatively, the NRC may issue the license if the license references a design certification, design approval, or manufactured reactor which meets the requirements of the aircraft impact rule. The 10 CFR 50.150(b)(1)(iii) requirement is in addition to other NRC requirements governing the issuance of the applicable license, e.g., 10 CFR 50.50, 50.57, and 52.97, and does not obviate the need for the NRC to make the applicable regulatory findings required by those NRC regulations. The provisions in paragraph (b)(1) of the final aircraft impact rule provide flexibility to the combined license applicant who wishes to use one of the currently approved design certifications with respect to the particular commercial pathway it may pursue to ensure that the currently approved design certification which it references is amended to comply with the aircraft impact rule.

By a "design-specific" assessment, the NRC means that the impact assessment must address the specific design of the facility which is either the subject of the construction permit, operating license, standard design certification, standard design approval, combined license, or manufacturing license application. The aircraft impact rule uses the term, "facility," for convenience, although the NRC recognizes that the scope of design addressed in a design approval, design certification, and manufactured reactor may be less than the complete facility and will be limited to non-site specific portions of the facility.

The final rule requires that the assessment be based on the aircraft impact characteristics specified in the rule. This approach is discussed in more detail in the section-by-section analysis for paragraph (b)(2) in this document.

“Design features and functional capabilities” represent design alternatives that could be included in the design of a facility. Design features are structures, systems, and components (SSCs), including the physical arrangement of such SSCs. Examples of design features are major structures such as reinforced concrete walls and slabs; redundancy and spatial separation of key SSCs; and diversity of power supplies. Functional capabilities are key characteristics of such SSCs that result in their contribution to avoiding or mitigating the effects of the aircraft impact. Examples of such functional capabilities are the flow capacity of a pump, the load carrying capacity of a wall, and the electrical capacity of power supplies.

When identifying potential design features and functional capabilities for inclusion in the design, the designer is expected consider whether these design features and functional capabilities would facilitate the implementation and/or enhance the effectiveness of practical responsive and mitigation actions that the nuclear power plant licensee could implement. For example, if the designer determines that a fire load due to the aircraft impact in a specific area could be extinguished or controlled through the placement of a standpipe and hose near the area, or that a fire affecting critical components with a limited time-temperature rating could be more quickly controlled with a larger amount of water delivered through a larger than normally-specified pipe, then the designer should consider the design feature of a new standpipe and hose, or the functional capability of a greater capacity (larger diameter) pipe.

The designer must determine, as part of the assessment, whether there are design features and functional capabilities that “avoid or mitigate,” to the extent practical, the “effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.” The designer must ensure that the survivability of each of these

key safety functions is considered in the initial assessment. By “avoid...the effects of the aircraft impact,” the NRC means that the resulting facility design, with the subject design features and functional capabilities incorporated, prevents the aircraft impact from affecting critical facility SSCs (i.e., through structural damage, shock and vibration effects, or fire). By “mitigate...the effects of the aircraft impact, the NRC means that the equipment that remains functional following the aircraft impact improves the facility’s ability to maintain core cooling capability, containment integrity, spent fuel cooling capability, or spent fuel pool integrity relative to what the facility’s ability to maintain these functions would be without the identified design features and functional capabilities. Thus, the designer’s focus should be on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity following the aircraft impact. These four plant functions are applicable to light water reactors (LWRs), and each may not be applicable to non-LWR reactor designs, or may have to be supplemented by other key functions. When reviewing non-LWR designs, the NRC will evaluate the applicability of the functional objectives set forth in the aircraft impact rule and the possible need for other objectives. If necessary, the NRC will issue exemptions and impose supplemental functions to be used in the aircraft impact assessment for such non-LWR designs. The NRC believes this regulatory approach is preferable to excluding non-LWRs from the applicability of the aircraft rule, because such an exclusion could be interpreted in an erroneous manner as reflecting the NRC’s belief that non-LWRs need not be designed against large, commercial aircraft impacts.

The design features and functional capabilities must avoid or mitigate, “to the extent practical” the effects of the aircraft impact. The NRC intends this standard to include those design features and functional capabilities which are realistically and reasonably feasible from a technical engineering perspective. For example, the NRC believes that it may be practical to employ existing technologies currently in use in the commercial nuclear power industry or in

another industry. However, it would not be practical to introduce a design feature or functional capability that could have adverse safety or security consequences under a different operational or accident scenario. Moreover, the NRC intends that designers include in their designs only those design features and functional capabilities that are reasonable, efficient, and workable. Thus, the final rule does not require a designer to use a design feature or functional capability which is, strictly speaking, technically capable of mitigating the effect of the aircraft impact, but which is not cost-effective or introduces inordinate complexities in integration into the plant design or operational procedures.

Notwithstanding the requirement for applicants to ensure that the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity are considered in the initial assessment, in performing the practicality evaluation, the NRC expects applicants to first consider the effects of the aircraft impact on core cooling capability and spent fuel cooling capability. If core cooling capability can be maintained with the applicant's identified design features and functional capabilities, then no further consideration of practical design features and functional capabilities to maintain containment integrity is necessary. Likewise, if spent fuel cooling capability can be maintained with the applicant's identified design features and functional capabilities, then no further consideration of practical design features and functional capabilities to maintain spent fuel pool integrity is necessary. However, if there are no practical means to maintain core cooling capability, then the applicant must also consider practical design features and functional capabilities to maintain containment integrity. Likewise, if there are no practical means to maintain spent fuel cooling capability, then the applicant must also consider practical design features and functional capabilities to maintain spent fuel pool integrity. The NRC reiterates, however, that the initial aircraft impact assessment must consider the effects of the aircraft impact on all four key safety functions—core cooling capability, containment integrity, spent fuel cooling capability, and spent

fuel pool integrity.

In addition to being practical, the design features and functional capabilities selected by the designer must avoid or mitigate the effects of the aircraft impact with “reduced reliance on operator action.” This means that active operator intervention and initiation of responsive action to maintain core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity should be reduced to the extent practical. The designer need not strive to achieve the absolute minimum in operator action. The NRC recognizes that there may be countervailing considerations that weigh against reducing to the absolute minimum the reliance on operator action to avoid or mitigate the effects of the aircraft impact. The NRC expects the designer to identify and consider in a reasonable process the goal of reducing operator action in avoiding or mitigating the effects of an aircraft impact. “Operator action” includes actions of operators in the control room or at alternative control panels or control areas to control the reactor and the nuclear facility.

The identification of potential design features and functional capabilities should be accomplished through a structured process which requires consideration of the insights gained by the assessment of the impact. Because the aircraft impact is a beyond-design-basis event, the methods and acceptance criteria used in the assessment should be based on realistic assumptions. The NRC recognizes that the designers’ approaches for implementing the rule may differ, depending upon the stage of completion of the facility design when this final rule is adopted. For example, if a facility design is largely or entirely completed when this rule becomes effective—as in the case of the current design applications under review by the NRC—the designer may focus on features and capabilities already included in the design or on potential enhancements of such features and capabilities, and then identify any additional features and capabilities. By contrast, a designer who has not yet commenced detailed design may decide to use an iterative screening process for identifying features and capabilities. By

presenting a performance-based objective, the aircraft impact rule does not require the designer to use a specific methodology, process or approach for identifying practical design features and functional capabilities that reduce reliance on operator actions. The designer may choose any number of ways to meet this performance requirement.

Paragraph (b)(2) specifies the aircraft impact characteristics which must be used by every applicant that must perform the assessment described in paragraph (b)(1). The characteristics of the aircraft impact must be that of a large, commercial aircraft used for long distance flights in the United States, with aviation fuel loads typically used for such flights. The rule refers to long distance flights “in the United States,” which means those which originate and terminate in the United States—viz., domestic flights. The NRC cautions, however, that the more specific assumptions regarding the aircraft impact will be provided in guidance documents and are not explicitly defined in the rule. The guidance will include the time-force curve or loading function that is derived from the aircraft impact characteristics for use in applicants’ assessment of the aircraft impact. In the case of a combined license applicant with a “custom” design,” the designer could take credit for site-specific topographic features (e.g., mountains) and siting features (e.g., the existence of non-plant structures) to limit the directions from which the plant could experience an impact.

Paragraph (c) requires the PSAR or FSAR for each license, certification, and regulatory approval application which is subject to 10 CFR 50.150(b)(1)(i) to include certain specified information related to compliance with the rule. This information consists of: (1) a description of the design features and functional capabilities which the applicant has selected (identified) for inclusion in the design to avoid or mitigate, to the extent practical, the effects of the aircraft impact; and (2) a concise description of how the identified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. The application should summarize the bases for the

applicant's determination that the selected features and capabilities incorporated into the facility design avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. The 10 CFR 50.150(c) information must be included in the PSAR or FSAR in accordance with 10 CFR 50.34(a)(13), 10 CFR 50.34(b)(12), 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 and capabilities selected by the applicant for inclusion in the plant design to address aircraft impacts.

The description of the features and capabilities 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 license, certification, or approval application.

Inclusion of any SGI in the information 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 regulations and procedures.

The NRC reiterates that aircraft impact is not a design basis event. Therefore, the design and construction of features and capabilities designated by the designer as meeting the aircraft impact rule's requirements need not meet the "special treatment" requirements⁵ applicable to safety-related and important to safety structures, systems, and components.

Paragraph (d) clarifies the requirements governing changes to information in the PSAR or FSAR which reflects the results of compliance with the aircraft impact rule for each of the licensing or certification processes subject to the aircraft impact rule. In the proposed aircraft

⁵ 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 and functional capabilities, selected by the applicant in accordance with 10 CFR 50.150.

impact rule, the provisions governing changes to such information were in proposed 10 CFR 52.502.

The PSAR or FSAR information required by the aircraft impact rule which is subject to the change control requirement in paragraph (d) are the descriptions of the design features and functional capabilities incorporated into the final design of the nuclear power facility, and the description of how the identified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. Not all of the actual change controls are presented in paragraph (d). Instead, most of the sections in paragraph (d) cite to an existing regulation presenting the FSAR change controls for that type of license or certification. Thus, in many cases, paragraph (d) is simply a “pointer” to the already-existing change controls. However, in all cases, the objective of the change controls remains the same: to determine whether the design of the facility, as changed or modified, avoids or mitigates—to the extent practical and with reduced reliance on operator actions—the effects of the aircraft impact. The rule does not impose an absolute requirement that a change to the facility must maintain whatever level of avoidance or mitigation was achieved by the design before the change or modification. Nonetheless, the NRC expects that absent compelling reasons, a licensee, vendor, or holder of a regulatory approval shall not propose or implement a design change or modification which eliminates a key safety function (*i.e.*, core cooling capability, containment integrity, spent fuel pool cooling capability, spent fuel pool integrity) which was provided by the design before the change or modification. The rule does not require an applicant or a licensee implementing a design change to redo the complete aircraft impact assessment to evaluate the effects of the change. The NRC believes it may be possible to demonstrate that a design change is bounded by the original design or that the change provides an equivalent level of protection, without redoing the original assessment.

Paragraph (d)(1) provides that, for construction permits which are subject to the aircraft

impact rule, if the permit holder changes the information required by 10 CFR 50.34(a)(13) to be included in the PSAR, then the permit holder shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(a)(13) to be included in PSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

Paragraph (d)(2) provides that, for operating licenses which are subject to the aircraft impact rule (*i.e.*, operating licenses for which the underlying construction permits are issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**), if the licensee changes the information required by 10 CFR 50.34(b)(12) to be included in the FSAR, then the licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(b)(12) to be included in the FSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

Paragraph (d)(3) provides that, for design certifications which are subject to the aircraft impact rule, 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 or functional capability 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 (d)(4)(i) provides that, for combined licenses which are subject to 10 CFR 50.150(b)(1)(i) (*i.e.*, combined licenses that do not reference a design certification,

design approval, or manufactured reactor), if the licensee changes the information required by 10 CFR 52.79(a)(47) to be included in the FSAR then the licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 52.79(a)(47) to be included in the FSAR to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact. The NRC believes that, because this rule addresses a beyond-design-basis event, it is appropriate to apply the same standard that was applied during the original assessment of design features and functional capabilities to any licensee-proposed changes to such features and capabilities.

Paragraph (d)(4)(ii) provides that, for combined license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii), proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the referenced standard design certification are governed by the change control requirements in the applicable design certification rule. The NRC expects to add a new change control provision to future design certification rules subject to 10 CFR 50.150 (including amendments to any of the four existing design certifications) to govern combined license applicants and holders referencing the design certification that request a departure from the design features or functional capabilities in the referenced design certification. The new change control provision will require that, if the applicant or 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 applicant or licensee shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b). The applicant or licensee must also describe in a change to the FSAR (i.e., a plant-specific departure from the generic design control document), how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

Paragraph (d)(4)(iii) provides that, for combined license applicants or holders which are not subject to 10 CFR 50.150(b) but reference a manufactured reactor which is subject to 10 CFR 50.150(b), 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.

Paragraph (d)(5)(i) provides that, for manufacturing licenses which are subject to 10 CFR 50.150(b)(1)(i), generic changes to the information required by 10 CFR 52.157(f)(32) to be included in the FSAR 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 (d)(5)(ii) provides that, for manufacturing license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii), proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the FSAR for the referenced standard design certification are governed by the change control requirements in the applicable design certification rule.

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 final rule revises this section by adding a new paragraph (a)(28) requiring that the FSAR contain the information required by 10 CFR 50.150, "Aircraft impact assessment." This information, as contained in paragraph (c) of 10 CFR 50.150, is:

1. A description of the design features and functional capabilities credited by the applicant to avoid or mitigate the effects of the aircraft impact; and
2. A description of how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

The 10 CFR 52.47(a)(28) requirement applies only to those standard design certification applications which are subject to 10 CFR 50.150, that is, those design certifications issued after the effective date of the final rule (see 10 CFR 50.150(a)). Thus, any standard design certification 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 10 CFR 50.150 must amend its application to include the information required by 10 CFR 50.150.

Section 52.59 *Criteria for renewal*

Section 52.59 establishes the criteria which must be met in order for the NRC to renew a standard design certification. The final rule revises paragraph (a) by adding a requirement that the Commission shall, the first time one of the four existing design certifications is to be renewed, find that the renewed design complies with the applicable requirements of the aircraft impact rule if the design certification has not already been amended to comply with the aircraft impact rule. This finding would be in addition to the (implicit) findings

which the Commission must make under paragraph (a). The findings need only be made the first time the design certification is renewed. Once the design certification has been amended or renewed to reflect compliance with the aircraft impact rule, there is no need for the NRC to remake the finding of compliance with the aircraft impact rule nor does the design or the assessment have to be upgraded for purposes of aircraft impact rule compliance in any subsequent amendment or renewal.

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 final rule revises this section by adding a new paragraph (a)(47) requiring that the FSAR contain the information required by 10 CFR 50.150. This is the same type of information that an applicant for a standard design certification will need to submit, namely, the following:

1. A description of the design features and functional capabilities credited by the applicant to avoid or mitigate the effects of the aircraft impact; and
2. A description of how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

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, or that reference a standard design certification issued before the effective date of the final rule which has not been amended to address the requirements of 10 CFR 50.150, are subject to 10 CFR 52.79(a)(47). Thus, a combined license application filed after the effective date of 10 CFR 50.150 and referencing a standard design certification, standard design approval, or

manufactured reactor subject to the proposed rule, or referencing one of the four current standard design certifications (ABWR, System 80+, AP600, and AP1000) which has been amended to address the requirements of 10 CFR 50.150 will not have to separately include the information required by 10 CFR 50.150 because it will be incorporated by reference to the standard design or manufactured reactor. 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 10 CFR 50.150, must amend its application to include the information required by 10 CFR 50.150.

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 final rule revises this section by adding a new paragraph (a)(26) requiring that the FSAR contain the information required by 10 CFR 50.150. This information, as currently presented in paragraph (c) of 10 CFR 50.150 is:

1. A description of the design features and functional capabilities credited by the applicant to avoid or mitigate the effects of the aircraft impact; and
2. A description of how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

The 10 CFR 52.137(a)(26) requirement applies only to those standard design approval

applications which are subject to 10 CFR 50.150, that is, those design approvals issued after the effective date of the final rule (see 10 CFR 50.150(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 10 CFR 50.150 must amend its application to include the information required by final 10 CFR 50.150.

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 final rule revises this section by adding a new paragraph (f)(32) requiring that the FSAR contain the information required by 10 CFR 50.150. This information, as currently presented in paragraph (c) of 10 CFR 50.150, is limited to the following:

1. A description of the design features and functional capabilities credited by the applicant to avoid or mitigate the effects of the aircraft impact; and
2. A description of how such design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

The 10 CFR 52.157(f)(32) requirement applies only to those manufacturing license applications which are subject to 10 CFR 50.150(b)(1)(i), that is, those manufacturing licenses that do not reference a design certification or design approval. 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 10 CFR 50.150 must amend its application to include the information required by 10 CFR 50.150.

VIII. Guidance

The NRC staff expects to issue new regulatory guidance on the requirements in 10 CFR 50.150 that will endorse guidance being prepared by NEI. 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 10 CFR 50.150. The final rule requires that the design-specific impact assessment use the aircraft impact characteristics specified in the rule. A more detailed description of the aircraft impact parameters that are considered appropriate for use in the assessment will be presented in the NRC's regulatory guidance. Because the portion of this regulatory guidance describing the detailed aircraft impact 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 will be made publicly available. Publication of the draft regulatory guidance is planned to coincide with publication of the final rule.

IX. Availability of Documents

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

Public Document Room (PDR). The NRC PDR is located at 11555 Rockville Pike, Rockville, Maryland 20852, e-mail pdr.resource@nrc.gov.

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

Document	PDR	Web	ERR (ADAMS)
SECY-06-0204, "Proposed Rulemaking—Security Assessment Requirements for New Nuclear Power Reactor Designs (RIN 3150-AH92)" (September 28, 2006)	X	X	ML062300068
Staff Requirements Memorandum for SECY-06-0204 (April 24, 2007)	X	X	ML071140119
Regulatory History Index for the October 3, 2007 proposed rule	X	X	ML073511644
Federal Register Notice	X	X	ML080420262
Environmental Assessment	X	X	ML081130377
Response to Public Comments	X	X	ML080290007
SECY-08-????, "Final Rule—Consideration of Aircraft Impacts for New Nuclear Power Reactors (RIN 3150-AI19)" (Month Date, 2008)	X	X	ML081050227
Staff Requirements Memorandum for SECY-08-???? (Month Date, 2008)	X	X	ML

X. 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.

XI. 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. In this final rule, the NRC is revising the requirements for new construction permits; new operating licenses; new standard design certifications; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing licenses that do not reference a standard design certification or standard design approval to perform an assessment of the effects on the designed facility of the impact of a large, commercial aircraft. The applicant must identify and incorporate into the design those practical design features and functional capabilities that avoid or mitigate the effects of an aircraft impact, addressing core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. The applicant is required to describe how such design and other features avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. This regulatory action does not establish standards with which all applicants must comply. For these reasons, the Commission concludes that this action does not constitute the establishment of a standard that contains generally applicable requirements.

XII. Finding of No Significant Environmental Impact: Availability

The Commission 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 is not a major Federal action significantly affecting the quality of the human environment and, therefore, an environmental impact statement (EIS) is not required. As presented in the final environmental assessment, this action will not have a significant environmental impact because it applies only to applicants for new nuclear power reactors and requires them to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the

aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel integrity, and because the standards and requirements applicable to radiological releases and effluents are not affected by this rulemaking.

The NRC requested public comments on any aspect of the environmental assessment. Three public comments were received that discussed the need for the preparation of an EIS for the aircraft impact rulemaking. The NRC responded that because the adoption of this rule does not constitute a major Federal action significantly affecting the environment, an EIS was not prepared for this rulemaking. The NRC also requested the views of the States on the environmental assessment for this rule. No State comments were received. Availability of the final environmental assessment is provided in Section IX of this document.

XIII. Paperwork Reduction Act Statement

The final rule contains new or amended information collection requirements contained in 10 CFR parts 50 and 52 that are subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). These requirements were approved by the Office of Management and Budget, approval numbers 3150-0011 and 3150-0151.

The burden to the public for these information collections is estimated to average 3,527 hours per response. This includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments on any aspect of these information collections, including suggestions for reducing the burden, to the Records and FOIA/Privacy Services Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet electronic mail to INFCOLLECTS@NRC.GOV; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0011), Office of Management and Budget, Washington, DC 20503.

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.

XIV. Regulatory Analysis

The NRC has prepared a regulatory analysis on this final rule and has included it in this *Federal Register* document. The analysis examines the costs and benefits of the alternatives considered by the NRC. No public comments were received on the proposed regulatory analysis.

1. Statement of the Problem and Objective

This final rule amends 10 CFR part 50 and 10 CFR part 52 to require applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant is required to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. These requirements apply to applicants for and holders of new construction permits; applicants for and holders of new operating licenses that reference a new construction permit; applicants for new standard design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and applicants for and holders of manufacturing licenses that do not reference a standard design certification or standard design approval. In addition, the requirements apply to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license.

Holders of these licenses and certifications are subject to requirements for the control of changes to the design features and functional capabilities identified as a result of complying with this final rule. The objective of this rule is to require nuclear power plant designers to perform a rigorous assessment of the design to identify design features and functional capabilities that could provide additional inherent protection to avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact.

2. Identification of Regulatory Alternatives

The only alternative considered was to conduct a rulemaking to require applicants to perform an aircraft impact assessment on new nuclear power reactors because the Commission directed the NRC staff in a staff requirements memorandum dated April 24, 2007, to 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 final rule.

The regulations in 10 CFR part 50 and 10 CFR part 52 will be amended for applicants for new nuclear power reactors to require these applicants to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant is required to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. These requirements apply to applicants for new construction permits; new operating licenses that reference a new construction permit; standard design certifications; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing licenses that do not reference a standard design certification or standard design approval.

This rule should result in new nuclear power reactor facilities being more inherently

robust with regard to an aircraft impact than if they were designed in the absence of this final rule.

3. Analysis of Values and Impacts of Final Rulemaking

3.1 Identification of Affected Attributes

The NRC identified the attributes that the 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 regulatory action will 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 regulatory action will 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 regulatory action will 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 regulatory action will 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 regulatory action will require applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant is required to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling

capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.

These requirements apply to applicants for and holders of new construction permits; applicants for and holders of new operating licenses that reference a new construction permit; applicants for standard design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses that do not reference a standard design certification, standard design approval, or manufactured; and applicants for and holders of manufacturing licenses that do not reference a standard design certification or standard design.

NRC Implementation. Under the regulatory action, the NRC will incur costs to develop guidance on performing an aircraft impact assessment and to review the actions taken by the applicant to comply with the aircraft impact rule.

Improvements in Knowledge. The regulatory action will improve knowledge by ensuring that nuclear power plant designers perform a rigorous assessment of the design to identify design features and functional capabilities that could provide additional inherent protection to avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact.

Safeguards and Security Considerations. The regulatory action to address the capability of new nuclear power reactors relative to an aircraft impact is based both on enhanced public health and safety and enhanced common defense and security, but is not necessary for adequate protection. Rather, this rule's goal is to enhance the facility's inherent robustness at the design stage.

3.2 Methodology

This section describes the process used to evaluate benefits and costs associated with the regulatory action. The benefits (values) come from any desirable changes in the affected attributes which are solely qualitative for the 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.

When possible, 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 this rulemaking. The regulatory action will affect these attributes through the associated reduction in the risks of aircraft impact damage to core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.

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 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, Revision 4, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," 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 from industry announcements on the estimated number of applications submitted for a new standard design certification and a combined license that

references a currently approved standard design certification. Given the uncertainty in the number of applications for a new construction permit; new operating license; new standard design approval; combined license that does not reference a standard design certification, standard design approval, or manufactured reactor; and manufacturing license that does not reference a standard design certification or standard design, the NRC staff applied its professional judgment in this analysis.

3.4 Assumptions

The regulatory action will apply only to applicants for and holders of new construction permits; applicants for and holders of new operating licenses that reference a new construction permit; applicants for new standard design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and applicants for and holders of manufacturing licenses that do not reference a standard design certification or standard design approval. It will not apply to a construction permit, operating license, standard design approval, or manufacturing license issued before the effective date of the final rule.

3.5 Analysis

For Sections 3.5.1 through 3.5.8, the cost-benefit analysis of the regulatory action is based on the assumed number of applicants in each category. In each case, industry will 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 \$100 and \$105 per hour for NRC and industry staff rates, respectively. In the analysis done for the proposed rule, an NRC hourly staff rate of \$105 was used. This value was recently revised to account for the changing composition of the NRC staff and re-baselining of estimates of hours for training, annual leave, etc. In addition, the NRC has reassessed the cost to purchase an appropriate SGI container and lock. This analysis uses

\$1,200, rather than the \$2,500 used for the proposed rule analysis.

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 Construction Permit Applications

Under the regulatory action, an applicant for a new construction permit will need to comply with the requirements for an aircraft impact assessment in 10 CFR 50.150. However, the NRC staff concludes that it is unlikely that a request for a new construction permit will be submitted to the NRC for approval during the next 20 years. Therefore, no cost-benefit analysis is needed for a construction permit.

3.5.2 Operating License Applications

Under the regulatory action, an applicant for a new operating license will need to comply with the requirements for an aircraft impact assessment in 10 CFR 50.150. However, the NRC staff concludes that it is unlikely that a request for a new operating license will be submitted to the NRC for approval during the next 20 years. Therefore, no cost-benefit analysis is needed for an operating license.

3.5.3 Standard Design Certification Applications

In implementing the regulatory action, standard design certification applicants will incur one-time costs to develop an SGI program; purchase an appropriate SGI storage container and lock; perform the aircraft impact assessment; and identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. The NRC estimates that each applicant will 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 will be \$13,000 per applicant (120 hours x \$105/hour). The NRC also estimates it will cost \$1,200 to purchase an appropriate

SGI storage container and lock. Finally, the NRC estimates it will take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months x 4 weeks/month x 40 hours/week x \$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 regulatory action is estimated to be \$415,000.

For the standard design certification process, this analysis assumes that three applications will be affected by the final rule in the first year that the rule is promulgated (i.e., year 0), and thereafter, one application will 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 will be recordkeeping costs for retention of the assessment and supporting documentation. The NRC will require standard design certification applicants to retain these records throughout the pendency of the application and for the term of the certification (including any period of renewal). 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. No renewal of the standard design certification rule is considered for this analysis. Thus, the records are retained for a total of 19 years. 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 x \$105/hour). 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.

After a standard design certification is adopted by the NRC, any change to a design

feature or functional capability credited for avoiding or mitigating the effects of an aircraft impact will require that the applicant or licensee consider the effect of the changed feature or capability on the original assessment. The applicant or licensee must describe how the modified feature or capability avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the applicable aircraft impact. However, the NRC staff concludes that after a standard design certification is adopted, it is unlikely that any changes will be made to design features or functional capabilities credited for avoiding or mitigating the effects of an aircraft impact. Therefore, no industry cost analysis is needed for this portion of the regulatory action.

Under the final rule, any combined license applicant referencing a design certification that complies with the requirements of this final rule will not have to perform an aircraft impact assessment.

Table 1. Summary of Industry Implementation Costs for Standard Design Certification Applicants			
		Implementation Costs	
Year	Number of Standard Design Certification Applications	Using 7-Percent Discount Rate (\$1,000)	Using 3-Percent Discount Rate (\$1,000)
0	3	1,200	1,200
4	1	320	370
8	1	240	330
12	1	180	290
16	1	140	260
20	1	110	230
TOTAL	8	2,190	2,680

Table 2. Summary of Industry Operating Costs for Standard Design Certification Applicants			
		Operating Costs	
Year*	Number of Standard Design Certification Applications	Using 7-Percent Discount Rate (\$1,000)	Using 3-Percent Discount Rate (\$1,000)
0	3	9.8	14
4	1	2.5	4
8	1	1.9	3.6
12	1	1.4	3.2
16	1	1.1	2.8
20	1	0.84	2.5
TOTAL	8	17.54	30.1

* 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.

3.5.4 Standard Design Approval Applications

Under the regulatory action, an applicant for a new standard design approval will need to comply with the requirements for an aircraft impact assessment in 10 CFR 50.150. However, the NRC staff concludes that it is unlikely that a request for a new standard design will be submitted to the NRC for approval during the next 20 years. Therefore, no cost-benefit analysis is needed for a standard design approval.

3.5.5 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 will be submitted to the NRC in year 10 following promulgation of the rule.

In implementing the regulatory action, combined license applicants will incur one-time costs to develop an SGI program; purchase an appropriate SGI storage container and lock; perform the aircraft impact assessment; and identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. The NRC estimates that each applicant will 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 will be \$13,000 per applicant (120 hours x \$105/hour). The NRC also estimates it will cost \$1,200 to purchase an appropriate SGI storage container and lock. Finally, the NRC estimates it will take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months x 4 weeks/month x 40 hours/week x \$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 regulatory

action is estimated to be \$415,000. 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 will be recordkeeping costs for retention of the assessment and supporting documentation. The NRC will require that these records be retained throughout the pendency of the application and for the term of the license (including any period of renewal). 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 (initial 40-year license period plus a 20-year renewal period), at which time the Commission terminates the facility license. The records are retained for a total of 64 years. 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 x \$105/hour). Thus, the discounted flow of funds of the recordkeeping costs for one application is \$6,000 and \$2,200 using 3- and 7-percent discount rates, respectively.

After a combined license application is approved by the NRC, any change to a design feature or functional capability credited for avoiding or mitigating the effects of an aircraft impact will require that the licensee consider the effect of the changed feature or capability on the original assessment. The reassessment must describe how the modified feature or capability avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the applicable aircraft impact. However, the NRC staff concludes that after a combined license is issued, it is unlikely that a licensee will make any changes to design features or functional capabilities credited at the application stage for avoiding or mitigating the effects of an aircraft impact. Therefore, no industry cost analysis is needed for this portion of the regulatory action.

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 (\$415,000) 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 \$6,000 and \$2,200 using the 3- and 7-percent discount rates as shown above. Therefore, the total discounted industry costs are \$316,000 and \$212,200 using 3- and 7-percent discount rates, respectively.

3.5.6 Combined License Applications Referencing a Currently Approved Standard Design Certification

Under the regulatory action, an applicant for a combined license who references one of the four currently approved design certifications must comply with the rule by referencing in its application either a currently approved design certification which has been amended to reflect compliance with the aircraft impact rule or an application for an amendment to a currently approved design certification, where the design is being amended to comply with the requirements of the aircraft impact rule. At present, the NRC is aware of only two of the currently approved designs that are planned to be referenced in combined license applications.

For one of these certified designs, the AP1000, the original applicant has voluntarily submitted to the NRC an amendment that it believes will comply with the requirements of the aircraft impact rule. If the NRC approves the amendment as meeting the aircraft impact rule, then any combined license applicants referencing the recertified design will not be required to perform an aircraft impact assessment. Furthermore, this analysis assumes that after the combined license application is approved, the licensee makes no changes to a design feature or functional capability credited by the design certification for avoiding or mitigating the effects of an aircraft impact. Therefore, no cost-benefit analysis is needed for combined license applications that reference the recertified AP1000 design.

Regarding the other currently approved designs, the NRC is not aware of any plans by the original applicant to submit an application to amend the certification to comply with the requirements of the aircraft impact rule. The NRC has received one combined license application referencing one of these certified designs, and it is expected that this final rule will be effective before the NRC makes a decision on the combined license application. Therefore, it is likely that the combined license applicant will be required to amend their application to comply with the requirements of the aircraft impact rule as described above.

In implementing the regulatory action, the NRC is assuming that the combined license applicant will submit a request to amend the currently approved design to comply with the aircraft impact rule. In doing so, this combined license applicant will incur one-time costs to develop an SGI program; purchase an appropriate SGI storage container and lock; perform the aircraft impact assessment; and identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. The NRC estimates that this applicant will 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 will be \$13,000 (120 hours x \$105/hour). The NRC also estimates it will cost \$1,200 to purchase an appropriate SGI storage container and lock. Finally, the NRC estimates it will take this applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months x 4 weeks/month x 40 hours/week x \$105/hour) to complete the assessment and incorporate the results into the design. In addition, the NRC estimates it will take this applicant 1 staff-month for a one-time cost of \$17,000 (1 staff-month x 4 weeks/month x 40 hours/week x \$105/hour) to do the administrative work to prepare a request for an amendment to the design certification. Thus, the one-time cost for this applicant to implement the regulatory action is estimated to be \$430,000. This analysis assumes that the

application will be affected by the final rule in the first year that the rule is promulgated (i.e., year 0), and therefore, the discounted flow of funds of the implementation costs is \$430,000 using either 3- or 7-percent discount rates.

With respect to industry operational costs, there will be recordkeeping costs for retention of the assessment and supporting documentation. The NRC will require that these records be retained throughout the pendency of the application and for the term of the license (including any period of renewal). 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 (initial 40-year license period plus a 20-year renewal period), at which time the Commission terminates the facility license. The records are retained for a total of 64 years. 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 x \$105/hour). Thus, the discounted flow of funds of the recordkeeping costs for one application is \$8,100 and \$4,300 using 3- and 7-percent discount rates, respectively.

After a combined license application is approved by the NRC, any change to a design feature or functional capability credited for avoiding or mitigating the effects of an aircraft impact will require that the licensee consider the effect of the changed feature or capability on the original assessment. The reassessment must describe how the modified feature or capability avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the applicable aircraft impact. However, the NRC staff concludes that after a combined license is approved, it is unlikely that a licensee will make any changes to design features or functional capabilities credited in the design certification at the application stage for avoiding or mitigating the effects of an aircraft impact. Therefore, no industry cost analysis is needed for this portion of the regulatory action.

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 (\$430,000) which when discounted is \$430,000 (using either 3- or 7-percent discount rates). The operating costs are \$8,100 and \$4,300 using the 3- and 7-percent discount rates as shown above. Therefore, the total discounted industry costs are \$438,100 and \$434,300 using 3- and 7-percent discount rates, respectively.

3.5.7 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 will be submitted to the NRC in year 10 following promulgation of the rule.

In implementing the regulatory action, manufacturing license applicants will incur one-time costs to develop an SGI program; purchase an appropriate SGI storage container and lock; perform the aircraft impact assessment; and identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of an aircraft impact. The NRC estimates that each applicant will 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 will be \$13,000 per applicant (120 hours x \$105/hour). The NRC also estimates it will cost \$1,200 to purchase an appropriate SGI storage container and lock. Finally, the NRC estimates it will take an applicant 24 staff-months for a one-time cost of \$400,000 (24 staff-months x 4 weeks/month x 40 hours/week x \$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 regulatory

action is estimated to be \$415,000. 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 will be recordkeeping costs for retention of the assessment and supporting documentation. The NRC will require that these records be retained throughout the pendency of the application and for the term of the license (including any period of renewal). 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 facility license. The records are retained for a total of 19 years. 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 x \$105/hour). Thus, the discounted flow of funds of the recordkeeping costs for one application is \$3,400 and \$1,700 using 3- and 7-percent discount rates, respectively.

After a manufacturing license application is approved by the NRC, any change to a design feature or functional capability credited for avoiding or mitigating the effects of an aircraft impact will require that the licensee consider the effect of the changed feature or capability on the original assessment. The reassessment must describe how the modified feature or capability avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the applicable aircraft impact. However, the NRC staff concludes that after a manufacturing license is approved, it is unlikely that a licensee will make any changes to design features or functional capabilities credited at the application stage for avoiding or mitigating the effects of an aircraft impact. Therefore, no industry cost analysis is needed for this matter.

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 (\$415,000) 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 \$3,400 and \$1,700 using the 3- and 7-percent discount rates as shown previously. Therefore, the total discounted industry costs are \$313,400 and \$211,700 using 3- and 7-percent discount rates, respectively.

3.5.8 NRC Implementation

Cost to Review the Applicant's Results. The NRC will incur costs to review the actions taken by the applicant to comply with the aircraft impact rule. The one time cost for NRC verification of compliance with the rule, consisting of reviewing the information submitted by each applicant and onsite inspection of the assessment, is estimated to be \$125,000 (7.8 staff-months x 4 weeks/month x 40 hours/week x \$100/hour). As an example, the total NRC cost in the first year that the rule is promulgated (i.e., year 0), is the present value of the costs to review the actions taken and assessments for three applications for a standard design certification. The NRC staff estimates the cost to be \$375,000 for the three applications. Table 3 shows the discounted flow of funds (using 3- and 7-percent discount rates) of the NRC implementation costs over 20 years to review the applications for a standard design certification; combined license that does not reference a standard design certification; combined license that references a standard design certification which has not been amended to comply with the final rule; and manufacturing license that does not reference a standard design certification.

Cost to Amend a Currently Approved Design Certification. The NRC assumes that it will take about 1.0 full-time equivalent (FTE) of staff time to complete the rulemaking to amend a currently approved design certification to comply with 10 CFR 50.150, in response to a combined license application referencing one of these certified designs. The cost of this action

is estimated to be \$160,000 (1.0 FTE at \$160,000), in the first year that the aircraft impact rule is promulgated (i.e., year 0).

Cost to Develop Guidance. The NRC assumes that it will take about 3.0 full-time equivalent of staff time to develop guidance to support implementation of the regulatory action. The cost to develop guidance is estimated to be \$500,000.

Cost to Provide Training. The NRC will incur costs to develop a training course to instruct NRC staff on the changes to 10 CFR parts 50 and 52. Assuming that it will take 20 staff-hours to develop the training course, the cost is estimated to be \$2,000 (20 staff-hours x \$100/hour). The cost to train 20 people for 2 hours, plus the instructor's time of 2 hours is estimated to be \$4,200 (21 people x 2 hours x \$100/hour). The total cost to the NRC to provide training for the regulatory action is estimated to be \$6,000.

Table 3 shows the discounted flow of funds of the total NRC implementation costs for the 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	350	365
1	1	COL	115	120
4	1	DC	95	110
8	1	DC	75	100
10	1	COL	65	95
10	1	ML	65	95
12	1	DC	55	90
16	1	DC	40	80
20	1	DC	30	70
Cost to Review All Applications			890	1,215
Cost to Amend a Currently Approved Design Certification			160	160
Cost to Develop Guidance			500	500
Cost to Provide Training			6	6
TOTAL			1,556	1,881

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

3.5.9 Impacts to Other Stakeholders

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

3.5.10 Qualitative Benefits of the Action

The benefits of the final rule can be evaluated only on a qualitative basis. The analysis estimates that the action will 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 will include improvements in knowledge because applicants for new nuclear power reactors will need to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. If the effects of an aircraft impact are not assessed by nuclear power plant designers at the design stage, it will be more difficult at a later time to enhance the inherent robustness of the facility to avoid or mitigate the effects of the aircraft impact. Furthermore, applicants will need to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity. In this manner, this rule should result in new nuclear power reactor facilities being more inherently robust with regard to an 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 provides an enhanced level of protection beyond that which is provided by the

existing adequate protection requirements, which all operating facilities are required to meet.

4. Presentation of Results

Table 4 summarizes the results of the cost analysis for industry.

Table 4. Summary of Total Industry Costs for Action		
Category of Application*	Using 7-Percent Discount Rate (\$1,000)	Using 3-Percent Discount Rate (\$1,000)
	Implementation Costs	
DC	2,190	2,680
COL	640	740
ML	210	310
	Operating Costs	
DC	17.54	30.1
COL	6.5	14.1
ML	1.7	3.4
TOTAL (rounded)	3,100	3,800

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

Table 5 shows the total costs of the 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	3,100	3,800
NRC	1,556	1,881
TOTAL (rounded)	4,700	5,700

5. Decision Rationale

The total present-valued costs of this action are \$5.7 million and \$4.7 million for 3- and

7-percent discount rates, respectively. The benefits are expressed only qualitatively and are discussed in Section 3.5.11 of this regulatory analysis. As noted previously, the key benefit is improvements in knowledge because the final rule requires applicants for new nuclear power reactors to perform a design-specific assessment of the effects of the impact of a large, commercial aircraft. The applicant will need to identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.

6. Implementation Schedule

The final rule will become effective 30 days after publication in the *Federal Register*.

XV. 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 have a significant economic impact on a substantial number of small entities. This final rule affects only the licensing of nuclear power plants. The companies that will apply for an approval, certification, permit, or license in accordance with the regulations affected by this rule 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).

XVI. Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this final rule and, therefore, a backfit analysis is not required, because the final rule does not contain any provisions that will impose backfitting as defined in the backfit rule. The final rule applies to applicants for and holders of new construction permits; applicants for and holders of new operating licenses that reference a new construction permit; applicants for new standard

design certifications; applicants for new standard design approvals; applicants for and holders of combined licenses; and applicants for and holders of manufacturing licenses. In addition, the requirements apply to the four existing design certifications in 10 CFR part 52, appendices A through D, but only if they are referenced in a combined license. The final aircraft impact rule, by ensuring that all design certifications referenced in a combined license comply with the aircraft rule, effectively ensures that the design of every combined license complies with the final rule. The backfitting issues for each of these licenses, certifications, and regulatory approvals are discussed in order below.

The final aircraft impact rule applies to applicants for and holders of construction permits issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**, the effective date of the aircraft impact rule. To the extent that the final rule revises the requirements for future construction permits, the requirements do not constitute backfitting, because the requirements in the final aircraft impact rule are prospective in nature and effect. The backfit rule was not intended to apply to every NRC action which substantially changes the expectations of future applicants under 10 CFR part 50. The final rule also does not apply to current holders of construction permits. Hence, there is no backfitting of current holders of construction permits.

The final aircraft impact rule also does not apply to applicants for operating licenses whose underlying construction permits are issued before **[INSERT EFFECTIVE DATE OF FINAL RULE]**. Inasmuch as the aircraft impact rule is not imposed as a requirement on operating license applicants whose underlying construction permits were issued before **[INSERT EFFECTIVE DATE OF FINAL RULE]**, there is no backfitting associated with such existing operating licenses. However, future applicants for operating licenses whose underlying construction permits were also issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]** are required to comply with the final aircraft impact rule. To the extent that the final rule revises the

requirements for future operating license applicants whose construction permits are issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**, the requirements do not constitute backfitting, because the requirements in the final aircraft impact rule are prospective in nature and effect. The backfit rule was not intended to apply to every NRC action which substantially changes the expectations of future applicants under 10 CFR part 50.

The final aircraft impact rule applies to new standard design certifications and new standard design approvals. To the extent that the final rule revises the requirements for future design certifications and design approvals issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**, the requirements do not constitute backfitting, because the requirements in the final aircraft impact rule are prospective in nature and effect. The backfit rule was not intended to apply to every NRC action which substantially changes the expectations of future applicants under 10 CFR part 52. The final aircraft impact rule does not apply to the four existing standard design approvals that were issued as part of the approval of the four existing design certifications. Hence, there is no backfitting of these existing design approvals. Applicability to the four existing design certifications is discussed later in this section.

The final aircraft impact rule applies to all combined licenses which do not reference a standard design certification, standard design approval or manufactured reactor. There are no existing combined 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 final rule revises the requirements for future combined licenses, including combined license applications which are currently pending before the NRC, the requirements do not constitute backfitting or are otherwise inconsistent with the finality provisions in 10 CFR part 52, because the requirements in the final aircraft impact rule 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.

The final aircraft impact rule applies to all manufacturing licenses which do not reference a standard design certification or standard design approval. There are no existing 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 final rule revises the requirements for future manufacturing licenses, the requirements do not constitute backfitting or are otherwise inconsistent with the finality provisions in 10 CFR part 52, because the requirements in the final aircraft impact rule 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.

The final aircraft impact rule does not directly change any of the four currently approved design certifications in 10 CFR part 52, appendices A through D. The rule does not legally require that the aircraft impact assessment be performed for the four currently approved design certifications, nor does it require that these designs be modified to include any design features or functional capabilities that meet the criteria in the aircraft impact rule. Nonetheless, the final rule changes the circumstances under which an applicant for combined license may reference one of the four currently approved design certifications. Each of the four currently approved design certification rules contains several provisions generally addressing the referencing of the design certification. None of these provisions contain a proviso requiring that the application be updated to address aircraft impacts. Moreover, Section VI, "Issue Resolution," of each currently approved design certification rule states that the NRC's safety finding on the design "includes the finding that additional or alternative structures, systems, components, design features,...acceptance criteria, or justifications are not necessary...." In addition, the NRC has decided that if any of the four currently approved design certifications have not been amended

to comply with the aircraft impact rule, then that design certification must be amended to reflect compliance with the aircraft impact rule the first time that the design certification is renewed under 10 CFR 52.57 through 10 CFR 52.61.

In light of these regulatory provisions, it could be argued that the aircraft impact rule effectively constitutes a change to those four currently approved design certifications, and such a change is governed by the change restrictions in Section VI of the design certification rules, as well as by the more general requirements in 10 CFR 52.63(a)(1). In addition, one may assert that the NRC may not adopt the new limitation on renewal of the four currently approved design certifications in § 52.59(a) unless the NRC finds under § 52.59(b) that the aircraft impact rule constitutes a substantial increase in protection of public health and safety and its implementation costs are justified in view of the increased protection.

Inasmuch as the final aircraft impact rule requirements, as applied to each of the four currently approved design certifications, effectively constitutes a change that is governed by Section VI of the design certification rules and 10 CFR 52.63(a)(1), the NRC has determined that this change is permitted by virtue of Section VIII, "Processes for Changes and Departures," paragraphs A, B, and C, of the design certification rules and 10 CFR 52.63(a)(1)(vi) and (vii). First, the NRC has determined that the final rule, as applied to the four currently approved design certifications, meets the criteria in § 52.63(a)(1)(vi) and (vii) governing changes to design certifications. The NRC believes that performing the assessment required by the rule, and the incorporation of design features and functional capabilities identified by the assessment, would constitute substantial increases in overall protection of public health and safety and that implementation costs are justified in view of the increased safety. Performing the assessment itself provides a substantial safety benefit in reducing licensee and regulatory uncertainty regarding the capability (and vulnerability) of the design to the impact of a large, commercial

aircraft. Moreover, all of the four currently approved certified designs contain one or more advance reactor attributes described in the Commission's "Policy Statement on Regulation of Advanced Nuclear Power Plants," (59 FR 35461; July 12, 1994). These attributes include the use of highly reliable and less complex shutdown and decay heat removal systems, longer time constants and sufficient instrumentation to allow for more diagnosis and management before reaching safety system challenge and/or exposure of vital equipment to adverse conditions, and designs that minimize the potential for severe accidents and their consequences by providing sufficient inherent safety, reliability, redundancy, diversity and independence in safety systems. Incorporation of practical design features and functional capabilities identified under the final aircraft impact rule into the four currently approved design certifications may also serve to further enhance the availability, capability or effectiveness of those advance reactor design attributes incorporated into the four existing design certifications. This enhancement may well provide substantial increases in protection to public health and safety with respect to the four existing design certifications. In addition, if any of the four currently approved design certifications are amended to include such design features and functional capabilities, then all combined licenses referencing that design certification will use those features and capabilities. Standardization is thereby enhanced through amendment of the any one of the four currently approved design certifications to add design features and functional capabilities identified under the provisions of the final aircraft impact rule. Although it is difficult to quantify the safety enhancement gained through implementation of the aircraft impact rule, the NRC nevertheless believes that the cost of performing the assessment and incorporating the results into the design, as outlined in Section XIV, "Regulatory Analysis," of the Supplementary Information, is justified in view of the increased safety provided by implementation of the aircraft impact rule. In addition, the final rule's inclusion of the "practicality" criterion for applicants' use in determining

whether to adopt particular design features and functional capabilities serves to limit the cost exposure of the applicant and future licensees using the design by only requiring inclusion of those items which are realistically feasible and cost-effective. In sum, the NRC determines that the aircraft impact rule, as applied to the four currently approved design certifications, meets the criteria in 10 CFR 52.63(a)(1)(vi) and (vii), as well as 10 CFR 52.59(b). Thus, regardless of the particular procedural path by which any of the four currently approved design certifications may be amended to reflect compliance with the aircraft impact rule, all applicable finality and backfitting provisions are satisfied.

In making these determinations, the NRC was aware of several factors. First, all of the commenters representing non-governmental organizations unaffiliated with the nuclear industry supported the application of the aircraft impact rule to all newly-constructed reactors—including those referencing currently approved design certifications—and to all of the currently approved design certifications regardless of whether they have been referenced in a combined license application. Second, NEI—the industry organization representing, in part, the companies who are most likely to be combined license applicants and, therefore, most likely to be adversely affected by a NRC decision to impose the aircraft impact rule on such applicants—supported the extension of the aircraft impact rule to all future combined license applicants. Third, the original applicants for three of the four existing design certifications supported modification of existing designs if they were actually referenced by combined license applicants. Fourth, the NRC is aware that Westinghouse Electric company, LLC, which was the applicant for the AP1000 design certification, intends to seek an amendment to the design certification to address the final aircraft impact rule. Fifth, the NRC notes that any adverse backfitting impact is limited inasmuch as no combined license referencing any of the four existing design certifications has been issued, and those submitted applications referencing one of the four

existing design certifications are still in the early stages of NRC review.

The NRC notes that adoption of the aircraft impact rule may indirectly result in the applicant (or another qualified entity) of one of the four existing design certifications voluntarily requesting an amendment to the design certification, in order to address the requirements of the aircraft impact rule (the rule does not mandate such an amendment to the design). Such changes, which would be accomplished through rulemaking, would also be subject to the change restrictions in 10 CFR 52.63. However, the NRC's bases for determining that the aircraft impact rule meets the change criteria in 10 CFR 52.63(a)(1)(vi) and (vii) would also apply to any design certification amendment rulemaking for the purpose of complying with the aircraft impact rule. Thus, the NRC expects that it would also be able to make the necessary findings under 10 CFR 52.63(a)(1)(vi) and (vii) should it be presented with an application to amend any of the four existing design certifications for the purpose of complying with the aircraft impact rule.

The NRC also evaluated whether the final aircraft impact rule's provisions governing the circumstances under which the NRC may issue a combined license referencing one of the four existing design certifications, effectively violates the issue resolution provision in 10 CFR 52.63(a)(5). Upon careful consideration, the NRC has determined that the change restriction in 10 CFR 52.63(a)(5) does not apply to these provisions of the final aircraft impact rule. The NRC's determination is based upon (in addition to the factors noted above) the flexibility afforded by the final aircraft impact rule to a license applicant referencing one of the four existing design certifications, as well as the nuclear power industry's stated preference that all nuclear power plants designed and constructed after **[INSERT EFFECTIVE DATE OF FINAL RULE]** meet the aircraft impact rule. The final aircraft impact rule provides four possible paths for obtaining the objective of the rule if one of the four currently approved design certifications is to be referenced in a combined license application:

1. The currently approved design certification may be amended to reflect compliance with the aircraft impact rule before it is referenced by the combined license applicant.
2. The currently approved design certification may form the basis for an application for a new design certification which complies with the aircraft impact rule and which is adopted in final form before it is referenced by the combined license applicant.
3. The combined license application may reference an application for an amendment to one of the four currently approved design certifications where the design is being amended to reflect compliance with the aircraft impact rule.
4. The combined license application may reference an application for a new design certification based upon one of the four currently approved designs, which is adopted in final form as a new design certification before the combined license is issued.

In light of the flexibility afforded by the final aircraft rule, the NRC determines that the final rule does not represent a violation of the finality provisions of 10 CFR 52.63(a)(5).

As discussed above, the NRC determined that requiring the four currently approved design certifications to comply with the aircraft impact renewal rule at the first renewal of their certifications (if they have not already been amended to comply with the aircraft impact rule) constitutes a substantial increase in protection to public health and safety that justifies the cost of implementing the rule. The NRC evaluated whether 10 CFR 50.150(b)(2)(iv) and the conforming revision to 10 CFR 52.59(a), which implement this requirement governing the renewal of these four design certifications, represent a violation of the limited finality protection provided by 10 CFR 52.59(b), and concludes they do not. The limited finality protections accorded by 10 CFR 52.59(b) requirements does not absolutely preclude the NRC from applying additional or new requirements to the design certification at the renewal stage; the NRC need only find that the additional or new requirement is necessary for adequate protection,

necessary for compliance with requirements in effect at the time of initial certification, or provides a substantial increase in protection to public health and safety or common defense and security that justifies the cost of implementing the new requirements.

As noted above, the Commission has made this finding on a generic basis in this rulemaking imposing this additional requirement on renewal. Given this finding, adopting this requirement generically - as opposed to making this for each design certification at its first renewal - does not represent any additional diminishment of the regulatory benefit accorded to each of the currently approved standard design certifications. The NRC's adoption of a generic requirement in 10 CFR 50.150(b)(1)(iv) and 10 CFR 52.59(a) governing renewal of the four existing certifications simply changed the timing of the necessary NRC finding required by 10 CFR 52.59(b). Accordingly, the NRC concludes that the limited finality provisions in 10 CFR 52.59(b) have been met in this rulemaking, and need not be re-made at the time of the first renewal of any of the four currently approved design certifications.

XVII. Congressional Review Act

Under the Congressional Review Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of the Office of Management and Budget.

List of Subjects

10 CFR Part 50

Antitrust, Classified information, Criminal penalties, Fire protection, Intergovernmental relations, Nuclear power plants and reactors, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

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. 552 and 553, the NRC is adopting the following amendments to 10 CFR parts 50 and 52.

PART 50 - DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

1. The authority citation for part 50 continues to read as follows:

AUTHORITY: Secs. 102, 103, 104, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); sec. 651(e), Pub. L. 109-58, 119 Stat. 806-810 (42 U.S.C. 2014, 2021, 2021b, 2111). Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 (42 U.S.C. 5841). Section 50.10 also issued under secs. 101, 185, 68 Stat. 955, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.13, 50.54(dd), and 50.103 also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138).

Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L. 91-

190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 88 Stat. 1245 (42 U.S.C. 5844). Sections 50.58, 50.91, and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80 - 50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

2. In § 50.8, paragraph (b) is revised to read as follows:

§ 50.8 Information collection requirements: OMB approval.

* * * * *

(b) The approved information collection requirements contained in this part appear in §§ 50.30, 50.33, 50.34, 50.34a, 50.35, 50.36, 50.36a, 50.36b, 50.44, 50.46, 50.47, 50.48, 50.49, 50.54, 50.55, 50.55a, 50.59, 50.60, 50.61, 50.62, 50.63, 50.64, 50.65, 50.66, 50.68, 50.69, 50.70, 50.71, 50.72, 50.74, 50.75, 50.80, 50.82, 50.90, 50.91, 50.120, 50.150, and appendices A, B, E, G, H, I, J, K, M, N,O, Q, R, and S to this part.

* * * * *

3. In § 50.34, paragraphs (a)(13) and (b)(12) are added to read as follows:

§ 50.34 Contents of construction permit and operating license applications; technical information.

* * * * *

(a) * * *

(13) On or after [INSERT EFFECTIVE DATE OF FINAL RULE] stationary power reactor applicants who apply for a construction permit which is subject to 10 CFR 50.150 shall submit the information required by 10 CFR 50.150 as a part of their preliminary safety analysis report.

(b) * * *

(12) On or after **[INSERT EFFECTIVE DATE OF FINAL RULE]** stationary power reactor applicants who apply for an operating license which is subject to 10 CFR 50.150 shall submit the information required by 10 CFR 50.150 as a part of their final safety analysis report.

* * * * *

4. A new undesignated center heading is added before § 50.120 to read as follows:

Additional Standards for Licenses, Certifications, and Regulatory Approvals

5. A new § 50.150 is added to read as follows:

§ 50.150 Aircraft impact assessment.

(a) Applicability. The requirements of this section apply to:

(1) Applicants for and holders of construction permits for nuclear power reactors issued under this part after **[INSERT EFFECTIVE DATE OF FINAL RULE]**;

(2) Applicants for and holders of operating licenses for nuclear power reactors issued under this part for which a construction permit was issued after **[INSERT EFFECTIVE DATE OF FINAL RULE]**;

(3) Standard design certifications issued under part 52 of this chapter;

(4) Applicants for standard design approvals issued under part 52 of this chapter after **[INSERT EFFECTIVE DATE OF FINAL RULE]**;

(5) Applicants for and holders of combined licenses issued under part 52 of this chapter;
and

(6) Applicants for and holders of manufacturing licenses issued under part 52 of this chapter.

(b) Assessment requirements.

(1) Assessment.

(i) Each applicant, other than an applicant for a combined license or a manufacturing

license referencing a standard design certification, standard design approval, or reactor manufactured under a manufacturing license, or a design for which a design certification application has been docketed but not granted, as applicable, shall perform a design-specific assessment of the effects on the facility of the impact of a large, commercial aircraft. The applicant shall identify and incorporate into the design those design features and functional capabilities that avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact on core cooling capability, containment integrity, spent fuel cooling capability, and spent fuel pool integrity.

(ii) Each applicant for a combined license or a manufacturing license referencing either a standard design certification or a design for which a design certification application has been docketed but not granted, shall reference in its application:

(A) A design certification which meets the requirements of this section:

(B) A design certification in effect on **[INSERT EFFECTIVE DATE OF FINAL RULE]** for which a design certification amendment application meeting the requirements of this section has been docketed but not granted; or

(C) A design for which a design certification application meeting the requirements of this section has been docketed but not granted.

(iii) Notwithstanding other NRC requirements, the NRC may issue a combined license, construction permit, operating license or manufacturing license only if the NRC finds that either the applicant has complied with the requirements of this section, or the license references a design certification, design approval, or reactor manufactured under a manufacturing license meeting the requirements of this section, as applicable.

(iv) If a standard design certification in effect on **[INSERT EFFECTIVE DATE OF FINAL RULE]** has not been amended to comply with the requirements of this section, then the standard design certification must comply with the requirements of this section at the first

renewal of the standard design certification.

(2) *Aircraft impact characteristics.* The assessment must be based on 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) *Content of application.* For applicants subject to paragraph (b)(1)(i) of this section, the preliminary or final safety analysis report, as applicable, must include a description of:

(1) The design features and functional capabilities identified in paragraph (b)(1)(i) of this section; and

(2) How the design features and functional capabilities identified in paragraph (b)(1)(i) of this section avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

(d) *Control of changes.*

(1) For construction permits which are subject to 10 CFR 50.150(b), if the permit holder changes the information required by 10 CFR 50.34(a)(13) to be included in the preliminary safety analysis report, then the permit holder shall consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(a)(13) to be included in the preliminary safety analysis report to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

(2) For operating licenses which are subject to 10 CFR 50.150(b), if the licensee changes the information required by 10 CFR 50.34(b)(12) to be included in the final safety analysis report, then the licensee shall consider the effect of the changed feature or capability

on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 50.34(b)(12) to be included in the final safety analysis report to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

(3) For standard design certifications which are subject to 10 CFR 50.150(b), 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.

(4)(i) For combined licenses which are subject to 10 CFR 50.150(b)(1)(i), 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 consider the effect of the changed feature or capability on the original assessment required by 10 CFR 50.150(b) and amend the information required by 10 CFR 52.79(a)(47) to be included in the final safety analysis report to describe how the modified design features and functional capabilities avoid or mitigate, to the extent practical and with reduced reliance on operator actions, the effects of the aircraft impact.

(ii) For combined license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii), proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the final safety analysis report for the referenced standard design certification are governed by the change control requirements in the applicable design certification rule.

(iii) For combined license applicants or holders which are not subject to 10 CFR 50.150(b) but reference a manufactured reactor which is subject to 10 CFR 50.150(b), 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).

(5)(i) For manufacturing licenses which are subject to 10 CFR 50.150(b)(1)(i), 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.

(ii) For manufacturing license applicants or holders which are subject to 10 CFR 50.150(b)(1)(ii), proposed departures from the information required by 10 CFR 52.47(a)(28) to be included in the final safety analysis report for the referenced standard design certification are governed by the change control requirements in the applicable design certification rule.

PART 52 - LICENSES, CERTIFICATIONS, AND APPROVALS FOR NUCLEAR POWER PLANTS

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

AUTHORITY: Secs. 103, 104, 161, 182, 183, 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, 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).

7. 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 50.150, the information required by 10 CFR 50.150.

* * * * *

8. In § 52.59, paragraph (a) is revised to read as follows:

§ 52.59 Criteria for renewal.

(a) The Commission shall issue a rule granting the renewal if the design, either as originally certified or as modified during the rulemaking on the renewal, complies with the Atomic Energy Act and the Commission's regulations applicable and in effect at the time the certification was issued, provided, however, that the first time the Commission issues a rule granting the renewal for a standard design certification in effect on [INSERT EFFECTIVE DATE OF FINAL RULE], the Commission shall, in addition, find that the renewed design complies with the applicable requirements of 10 CFR 50.150.

* * * * *

9. 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 50.150, the information required by 10 CFR 50.150.

* * * * *

10. 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 50.150, the information required by 10 CFR 50.150.

* * * * *

11. 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 50.150, the information required by 10 CFR 50.150.

Dated at Rockville, Maryland, this ___ day of _____ 2008.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,
Secretary of the Commission.

(f) * * *

(32) For applications for manufacturing licenses which are subject to 10 CFR 50.150, the information required by 10 CFR 50.150.

Dated at Rockville, Maryland, this ___ day of _____ 2008.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,
Secretary of the Commission.

WITS 200700155 / EDATS: SECY-2007-0133 & WITS200700156 / EDATS: SECY-2007-0432
ADAMS Accession No.: ML082670873(Package); ML081050227(SECY Paper)

OFFICE	NRR	NRO	NRR	NRO	Tech Editor	NRR
NAME	SSchneider	NGilles	JZimmerman	(WDean for)	CHsu	MCase
DATE	04/22/08	04/22/08	09/25/08	05/06/08	05/01/08	09/25/08
OFFICE	FSME	ADM	OCFO	OE	NSIR	OIS
NAME	CMiller (Almboden for)	MLesar	JDyer	CCarpenter	RZimmerman	MJanney
DATE	06/16/08	06/27/08	07/03/08	07/14/08	07/02/08	07/30/08
OFFICE	RES	NRO	NRO	NRR	OGC	EDO
NAME	BSheron	GHolahan	MJohnson	ELeeds	KCyr	RBorchardt
DATE	09/26/08	09/30/08	09/30/08	09/25/08	/ /08	/ /08

OFFICIAL RECORD COPY