



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 17, 2009

SECRETARY

COMMISSION VOTING RECORD

DECISION ITEM: SECY-08-0152

TITLE: FINAL RULE—CONSIDERATION OF AIRCRAFT IMPACTS  
FOR NEW NUCLEAR POWER REACTORS (RIN 3150-AI19)

The Commission (with Chairman Klein and Commissioners Jaczko and Lyons agreeing) approved the final rule as noted in an Affirmation Session and recorded in the Staff Requirements Memorandum (SRM) of February 17, 2009. Commissioner Svinicki approved the final rule as presented by the staff and without the specific acceptance criteria approved by the Commission.

This Record contains a summary of voting on this matter together with the individual vote sheets, views and comments of the Commission.

A handwritten signature in black ink, appearing to read "Annette L. Vietti-Cook", written over a horizontal line.

Annette L. Vietti-Cook  
Secretary of the Commission

Attachments:

1. Voting Summary
2. Commissioner Vote Sheets

cc: Chairman Klein  
Commissioner Jaczko  
Commissioner Lyons  
Commissioner Svinicki  
OGC  
EDO  
PDR

VOTING SUMMARY - SECY-08-0152

RECORDED VOTES

	APRVD	DISAPRVD	ABSTAIN	NOT PARTICIP	COMMENTS	DATE
CHRM. KLEIN	X				X	1/9/09
COMR. JACZKO	X				X	11/6/08
COMR. LYONS	X				X	11/7/08
COMR. SVINICKI	X				X	1/30/09

COMMENT RESOLUTION

In their vote sheets, all Commissioners approved the final rule and provided additional comments. Subsequently, the comments of the Commission were incorporated into the guidance to the staff as reflected in the SRM issued on February 17, 2009. Commissioner Svinicki voted to approve the final rule as presented by the staff, and without the specific acceptance criteria approved by the Commission.

**AFFIRMATION ITEM**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: CHAIRMAN KLEIN  
SUBJECT: SECY-08-0152 – FINAL RULE—CONSIDERATION OF  
AIRCRAFT IMPACTS FOR NEW NUCLEAR POWER  
REACTORS (RIN 3150-AI19)

Approved XX Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below \_\_\_\_\_ Attached XX None \_\_\_\_\_

  
\_\_\_\_\_  
SIGNATURE

1/9/09  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes  No \_\_\_\_\_

**Chairman Klein's Vote on SECY-08-0152**  
**Final Rule- Consideration of Aircraft Impacts of New Nuclear Reactors**

I approve the final rule subject to the edits provided by Commissioner Jaczko and subject to the comments below.

I want to begin by commending the staff's diligent efforts in developing this draft final rule which I am confident will result in the new generation of reactors built in the United States being inherently more capable of tolerating beyond design basis events, including the impact of a large commercial aircraft.

In approving this rule, I would like to briefly reflect on its history in order to emphasize a few points. The Commission did not always agree on every element of this rule. There was a significant amount of personal involvement by the entire Commission in the consideration of this rule. There were numerous opportunities to raise differing views about proposed regulatory requirements related to the evaluation of postulated aircraft impacts, as well as discussions about the associated legal and technical issues. I wish to acknowledge my former colleague Commissioner Ed McGaffigan for his tireless, selfless dedication toward the development of this rule. I think my fellow Commissioners would agree that without the energy he devoted to this effort everyday, up to the week he died, the Commission may have never been able to come to common ground on this very important issue. I am confident that his efforts, coupled with the staff's determination and diligence, have collectively resulted in a rule which will result in the new reactors having an additional margin of safety far beyond that required to assure public health and safety.

Long before this rule was proposed, the Commission had taken substantial action on the issue of aircraft impact, albeit most of it was associated with the operating reactors. In response to the terrorist attacks of 9/11/2001 the Commission issued an order requiring all operating power reactors to develop and adopt mitigative strategies to cope with large fires and explosions, including those caused by an aircraft impact. The requirements in that Order are currently being codified in proposed revisions to 10 CFR 73 and 10 CFR 50 which will require both current and future power reactors to adopt such strategies. Those measures are adequate to achieve reasonable assurance of public health and safety. That said, during the Commission's review of SECY-06-0204-PROPOSED RULEMAKING- SECURITY REQUIREMENTS FOR NEW NUCLEAR POWER REACTOR DESIGNS in early 2007 it became obvious that new rulemaking was needed to specifically address the issue of aircraft impact assessment requirements for new reactors. The Commission chose to address the impact of a large commercial aircraft, clearly a beyond-design-basis event, in a manner consistent with NRC's previous approach to such events. The Commission directed the staff to terminate the proposed 10 CFR 73.62 rulemaking and develop new rulemaking using suggested language in my vote on SECY-06-0204. In my vote, I expressed my belief that the aircraft impact assessment requirements should be included in 10 CFR Part 52 to allow reactor designers to incorporate security measures at an early stage in the design process. Nuclear power plant designers would be required to perform a rigorous assessment of design features that could provide additional inherent protection from the effects of an aircraft impact, while reducing the need for operator actions. These assessments would have the manifest benefit of the lessons learned from the assessments performed by the staff and national laboratories of aircraft impacts on the operating reactors.

I firmly believe that this rule is consistent with the NRC's historic approach to beyond-design-basis events and in fact essentially models the position taken by the NRC in the 1985 severe accident policy statement: "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 Commission reiterated that regulatory approach in the 1986 policy statement on advanced nuclear power plants: "The Commission expects that advanced reactors would provide more margin prior to exceeding safety limits and/or utilize simplified, inherent, passive, or other innovative means to reliably accomplish their safety functions." This regulatory approach has been demonstrated to be successful, as all designs subsequently submitted to and certified by the Commission represent an almost two orders of magnitude improvement in safety from operational events and accidents.

The Commission had diverging views concerning the applicability of the proposed rule to existing certified designs. In as much as all new plants will be subject to the proposed revisions to 10 CFR 73 and 10 CFR 50, it was my opinion that reactor designs that had already been certified under Part 52 (e.g. AP1000 and ABWR) did not need to be backfit nor re-certified in accordance with this rule. I also considered it to be highly likely that the reactor designers would want to perform this assessment for their clients since it would be in both the designers' and the clients' interest to adopt practicable changes at the design stage rather than employing post construction mitigating measures and relying on operator actions as was necessary for the operating reactors. During the public comment period, the majority of commenters opined that all new reactors including the certified designs should be subject to the rule since the underlying objectives of the rule would not be achieved if a sub-set of the new plants, those with certified designs, did not have to comply with the rule. The staff agreed with the commenters and has made the necessary changes in the rule. It is worth mentioning that at the same time this rule was being developed the reactor vendors began performing design specific aircraft impact analyses in the realization that those analyses would have to be done either for this proposed rule or for the proposed revisions to 10 CFR 73 and 10 CFR 50.

The use of the term "practical" in the rule was also the subject of debate. The proposed rule would have required applicants to describe how the design and other features would avoid or mitigate "to the extent practicable" the effects of the applicable aircraft impact with reduced reliance on operator actions. In part, the intent was to allow designers to incorporate design features which are realistically and reasonably feasible from an engineering perspective. It also would have allowed the designers to evaluate potential competing technical factors, such as the response to earthquakes and passive safety systems, while addressing aircraft impacts. Retaining language that would have required designers to adopt design features "to the extent practicable" would also have conveyed more clearly that costs may appropriately be considered when determining whether various mitigating design features identified as a result of an aircraft-impact assessment are required to be implemented. Consideration of costs is sensible and appropriate under this rule, which is not required for adequate protection of the public but provides an additional margin of protection against an improbable, beyond-design-basis event.

Ultimately, I approve removing "to the extent practical" from the text of the final rule. Experience has shown that reactor suppliers can and will identify practical design changes to deal with beyond-design-basis events, including aircraft impacts. In my view, the final rule text, which requires "realistic" analyses and "reduced" reliance on operator actions, will still afford designers sufficient flexibility in selecting practical options for complying with the rule's acceptance criteria.

Overall, I am very pleased with the expected outcome of this rulemaking. I see it as the culmination of the dedicated efforts and in some cases the passion of the Commissioners spanning the period back to 9/11/2001. Of course were it not for the staff's diligence in carrying out Commission guidance, we certainly would not have achieved this goal. I am quite confident that this rule will be an important element in the regulatory framework for new reactor applicants that would result in a margin of safety far beyond that required to achieve reasonable assurance of public health and safety.

 11/9/09  
Dale E. Klein Date

**AFFIRMATION ITEM**

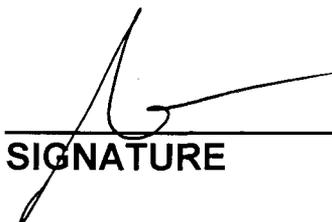
**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER JACZKO  
SUBJECT: SECY-08-0152 – FINAL RULE—CONSIDERATION OF  
AIRCRAFT IMPACTS FOR NEW NUCLEAR POWER  
REACTORS (RIN 3150-AI19)

Approved  X  Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below \_\_\_\_\_ Attached  X  None \_\_\_\_\_

  
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11/6/08  
\_\_\_\_\_  
DATE

Entered on "STARS" Yes  X  No \_\_\_\_\_

**Commissioner Jaczko's Vote on SECY-08-0152**  
**Final Rule - Consideration of Aircraft Impacts for New Nuclear Power Reactors**  
**(RIN 3150-AI19)**

I appreciate the significant effort the public put into commenting on the proposed rule and that the staff applied to develop this draft final rule. I am pleased the rule will apply to any new plant that may be built in the U.S. and I approve the rule subject to the two following changes:

First, I support criteria that would require applicants to show they have incorporated design features and functional capabilities so that even in the event of an aircraft impact at a nuclear power plant, the reactor core would remain cooled or the containment structure would remain intact. In addition, the spent fuel cooling or spent fuel pool integrity would be maintained. Applicants could use a realistic analysis to assess their designs but could not simply rely on operator actions to meet the requirements.

Therefore, all references to "mitigating, to the extent practical...the effects of the aircraft impact" should be deleted from the rule language, beginning at 50.150(b)(1)(i), and replaced with the following acceptance criteria:

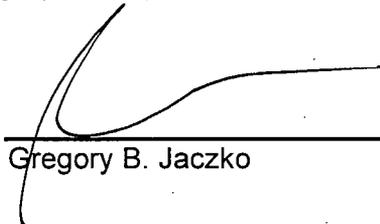
**"Each applicant subject to this section shall perform a design-specific assessment of the effects on the facility of the impact of a large, commercial aircraft. Using realistic analyses, the applicant shall identify and incorporate into the design those design features and functional capabilities to show that, with reduced use of operator actions:**

**(A) the reactor core remains cooled, or the containment remains intact; and**  
**(B) spent fuel cooling or spent fuel pool integrity is maintained."**

Second, while the requirements of this draft final rule must be strengthened as stated above, I do believe there is one area that should be made more flexible. The current version of the rule would mandate that for an application for a combined license referencing an existing design certification, the necessary steps to amend that design certification be taken to address the rule's requirements. Philosophically, this is a good approach to ensure standardization of designs, and I believe most applicants will choose this path and go through the public rulemaking process to amend the referenced design certifications. I do not believe that the agency must mandate such an approach however.

Consistent with the flexibility inherent in the part 52 process, applicants should be allowed the option of deciding to meet the requirements of this rule at the COL stage without requiring amendment of the referenced certified design. The impact of this change on the goal of standardization should not be too great, as certified designs will have to be amended at their 15 year renewal anyway. Therefore, I support the commenters who would allow a combined license applicant referencing an existing design certification the flexibility to address the rule's requirements solely in the COL application.

The staff should therefore edit the entire rulemaking package to be consistent with the above changes. The staff should also make appropriate conforming changes to § 52.63 and § 52.83, and the current design certification rules (e.g., paragraph VI.A)

  
11/6/08  
\_\_\_\_\_  
Gregory B. Jaczko                      Date

**AFFIRMATION ITEM**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER LYONS  
SUBJECT: SECY-08-0152 – FINAL RULE—CONSIDERATION OF  
AIRCRAFT IMPACTS FOR NEW NUCLEAR POWER  
REACTORS (RIN 3150-AI19)

Approved  X  Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below \_\_\_\_\_ Attached  X  None \_\_\_\_\_



Peter B. Lyons

SIGNATURE

11/ 7 /08

DATE

Entered on "STARS" Yes  X  No \_\_\_\_\_

**Commissioner Lyons's Vote on SECY-08-0152**

Final Rule – Consideration of Aircraft Impacts for New Nuclear Power Reactors  
(RIN 3150-A119)

I approve of the final rule subject to the edits provided by Commissioner Jaczko and subject to the comments below. I want to praise the staff for their diligence in working through the significant details associated with this rule. In approving this rule, I would like to emphasize the following points.

As I have previously stated, I believe the requirements to provide mitigation strategies for large area fires and explosions currently imposed on operating reactors, and the similar requirements for future reactors that are expected to be codified in 10 CFR 73.55 and related regulations, are adequate to achieve reasonable assurance of public health and safety. I also continue to believe that subsequent generations of plants to be built in the U.S. will be inherently more capable of resisting beyond design basis events, including aircraft crashes, due to safety improvements previously incorporated into these designs. The addition of this rule, revised to include specific acceptance criteria, will provide additional public confidence that all reasonable design measures were taken to add additional margin beyond the adequate protection standard that is already met through compliance with 73.55.

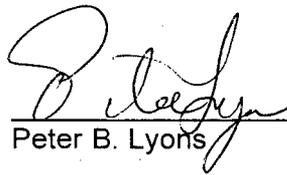
By adopting the edits to this proposed rule, all future nuclear power plants built in the U.S. will be required to comply with this rule, including those referencing an already approved design. However, reactors currently under construction or previously authorized for construction pursuant to 10 CFR Part 50 should not be subject to this rule. As with the currently operating reactors, current regulatory requirements and the enhancements that are expected to be codified in 10 CFR 73.55 and related regulations are adequate to achieve reasonable assurance of public health and safety.

Performing the assessment required by the rule and the incorporation of design features and functional capabilities identified by the assessment to meet specified acceptance criteria constitute substantial increases in overall safety and reliability of facility design due to a decreased dependence on mitigation strategies. Therefore, implementation costs are justified in view of the increased safety and reliability of the design. The staff should revise the backfit analysis and descriptions in the statements of consideration to clarify that substantial increases in overall safety and reliability of facility design are the basis for meeting 10 CFR 52.63. This should replace the statements that provide the basis as "substantial increases in overall protection of public health and safety."

I believe that the addition of specific acceptance criteria to this rule adds regulatory stability and predictability that is not achievable with criteria that contains "to the extent practical." Acceptance criteria that are based on functional requirements provide a benchmark that can be assessed for the purpose of determining compliance with this rule, yet provide the distinction necessary to keep enhancements implemented for a beyond design basis event separate from design requirements necessary to meet 10 CFR Part 100. The staff should review the justification provided in the backfit analysis and eliminate logic that is based on the acceptance criteria of practicality.

As I stated in my previous vote on the proposed rule and as discussed in the statements of consideration of this rule, the choice of aircraft characteristics and the scenario used for analysis should not be linked to threat assessments or to any evolution of aircraft design. Because this rule addresses design features and functional capabilities for the purpose of adding incremental

margin for a beyond design basis event, this stipulation is essential for assuring regulatory stability. I specifically support the assessment methods, based on realistic assumptions as described in the statements of consideration, as adequate to comply with this rule. The assessment methods and clarification of what constitutes realistic assumptions should be further developed by the staff and promulgated in guidance.

 11/7/08  
Peter B. Lyons Date

**AFFIRMATION ITEM**

**RESPONSE SHEET**

TO: Annette Vietti-Cook, Secretary  
FROM: COMMISSIONER SVINICKI  
SUBJECT: SECY-08-0152 – FINAL RULE—CONSIDERATION OF AIRCRAFT IMPACTS FOR NEW NUCLEAR POWER REACTORS (RIN 3150-AI19)

Approved XX Disapproved \_\_\_\_\_ Abstain \_\_\_\_\_

Not Participating \_\_\_\_\_

COMMENTS: Below \_\_\_\_\_ Attached XX None \_\_\_\_\_

  
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0130/09  
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DATE

Entered on "STARS" Yes  No \_\_\_\_\_

**Commissioner Svinicki's Comments on SECY-08-0152**  
**Final Rule – Consideration of Aircraft Impacts for New Nuclear Power Reactors**

I approve for publication in the *Federal Register* the notice of final rulemaking as presented by the staff, subject to the comments below, and without the acceptance criteria proposed by Commissioner Jaczko in his vote and supported by Chairman Klein and Commissioner Lyons in their votes. I acknowledge that the acceptance criteria proposed by Commissioner Jaczko are measured and I credit him for his careful approach, but I believe I view the issue through a different lens. My difference is with the notion of instituting "pass/fail" criteria, however they might be termed, against a scenario which is clearly beyond the design basis, which represents an attack by an enemy-of-the-state, and which is not a scenario that private entities can be expected to eliminate, repel or defeat. The establishment of pass/fail criteria with respect to such scenarios is, in my view, a profound regulatory departure, and represents a first step down a road with no defined endpoint and where future Commissions may well wish we had not ventured.

The aircraft impact draft final rule currently before the Commission is a capstone in the NRC's security-related efforts; efforts that began long before my service on the Commission. In studying this record in its totality, I have formed the view that the NRC's regulatory response to the events of September 11, 2001 and the industry's implementing actions stand as a singular achievement which has done more, in absolute terms, to further harden an already extremely robust and well-defended sector, to levels well beyond those of other sectors of this Nation's critical infrastructure. Tens of thousands of both government and private sector man-hours have been and continue to be devoted to this cause and hundreds of millions of dollars have been spent. These efforts continue, and in some ways, culminate, in this last element of the post-September 11<sup>th</sup> threat environment – aircraft impact. A comprehensive program of assessment and mitigation has been undertaken for currently-operating power reactor licensees and now we seek to finalize the approach to consideration of aircraft impacts for new nuclear power reactors. To that end, the NRC staff has brought forward a proposed final rule that is implementable, understandable, internally consistent, entirely responsive to the direction provided in the prior Commission decision, and thorough in its consideration and resolution of the issues. I am impressed with the staff's work product and grateful for the staff's dedication to this task. I support the final rule as drafted by the staff, subject to the comments below.

This is a complex issue, however. As noted in the design basis threat final rule (72 FR 12705; 19 March 2007), the Commission recognizes that the defense of a nuclear power facility against beyond-design-basis threats is the responsibility of the federal government, not individual reactor licensees. For that reason, I support the approach to aircraft impact assessments in this rule as put forward by the staff in SECY-08-0152. The approach is summarized nicely in the Analysis of Public Comments (Enclosure 3, page 57) which states: "The final rule . . . sets forth the following criteria for identifying design features and functional capabilities: (1) the design features and functional capabilities must be directed at avoiding or mitigating the effects of the aircraft impact on the four plant safety functions listed in the rule; (2) the features and capabilities must accomplish avoidance or mitigation with reduced reliance on operator action; and (3) the features and capabilities must accomplish avoidance and mitigation to the extent practical. *The NRC believes that this level of description of acceptance criteria is sufficient to provide regulatory efficiency, predictability and transparency, given the*

*NRC's determination that the applicable aircraft impact is a beyond-design-basis event.* (Emphasis added.) The rule as put forward by the staff acknowledges that mitigating capabilities for beyond-design-basis events that result in large fires and explosions are needed for new plants, and, as such, the "practicability" standard used in the final rule would form a parallel to "B.5.b measures" for existing plants.

Furthermore, the proposed methodology for performing aircraft impact assessments for new plant designs – laid out in guidance; still in draft form -- outlines an analysis that is quite rigorous and one which calls for surprisingly conservative assumptions to be used in this "realistic" analysis. As a matter of simple pragmatism, it is clear that although new reactor designs are already tremendously robust, the standardized approach to aircraft impact assessments outlined in the draft final rule would harmonize the evaluation of this beyond-design-basis event across the fleet of new designs and harvest any benefits of design features which could mitigate against the consequences of such an event at the most cost-effective stage – before design certification.

My rejection of more specific "acceptance criteria", while apparently out of step with my current colleagues, is, I would note, in alignment with prior commissioners' votes on this (proposed, at that time) rule (SECY-06-0204). Commissioner McGaffigan, by my reading, appears to have rejected acceptance criteria quite summarily. In reasoning against acceptance criteria (beyond a simple "practicability" standard) in his vote on the proposed rule, he stated: "There are an infinity of possible beyond-design-basis events. Imposing design bases criteria on one such event is not warranted." I also agree with the reasoning in Chairman Klein's vote on the proposed rule which noted, "the resulting [aircraft impact] assessments performed by applicants will serve to bound less conservative scenarios, but remains only one of an unlimited number of possible larger, faster beyond-design-basis aircraft impact scenarios. Therefore, I believe it is inappropriate to specify a specific assessment acceptance criteria in this proposed rule. To the contrary, I believe that the approach taken in this proposed rule is consistent with the historical and successful NRC approach to beyond-design-basis events."

I am voting last and the likely outcome of Commission consideration of this rule is apparent to me as I write this. I reviewed carefully the votes of my colleagues and attempted to envision how both the rule and its accompanying documents would be revised by the staff in the course of complying with any eventual direction to incorporate the acceptance criteria proposed by Commissioner Jaczko and to make all necessary conforming changes. I was struck by the enormity of the task. Having been directed in the Commission's previous SRM to prepare a rule based on a "practicability" standard of evaluation (changed to "practical" in the draft final rule), the staff has put forward an entire rule package which is fundamentally oriented towards supporting the notion of design features and mitigating measures which are practical, feasible, and cost effective. The rule itself and the regulatory approach it espouses, as outlined in the statement of considerations, the environmental assessment, and the analysis of public comments, are replete with concepts and considerations which do not support the proposed acceptance criteria supported by my colleagues.

Worse yet, the task of recasting the draft final rule and associated documents into a package to support these acceptance criteria will bring into being a number of substantial policy questions. In some cases, the staff may well be left to guess the Commission's will. For example, the rule as put before us by the staff "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” stating further, “[t]he 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.” (Draft FRN, page 73.) If the rule is recast to include acceptance criteria, such an “absolute requirement” is indeed imposed. Furthermore, it seems reasonable that these same ambiguities over the exact threshold for triggering a re-analysis of aircraft impact would cast a shadow on any assurance the rule would purport to give regarding whether aircraft impact issues are afforded issue resolution in this rule. Additionally, if such implementation details are revisited, the assessment of industry implementation costs which is part of the proposed *Federal Register* notice must also, consequently, be redone.

As another example of the profound change in altering the draft final rule to include acceptance criteria, beginning on page 68 of the draft *Federal Register* notice, there is a discussion of how the NRC will judge the adequacy of the aircraft impact assessment. It reads, in part, “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.” If the rule is modified to incorporate acceptance criteria, however, the fundamental orientation must be shifted to satisfying those criteria alone, and these statements about practicality and cost are no longer true – an unfortunate departure from the prior Commission decision on the proposed rulemaking package, where a majority of Commissioners supported the consideration of practicality and cost as appropriate elements of the regulatory approach to aircraft impact scenarios.

My purpose here is not to nit-pick the alterations that the staff would have to make in recasting this draft final rule to switch the approach to one of using acceptance criteria or to suggest that the staff is not up to the task. It is to point out that this is not a clerical undertaking. These modifications will be both substantial and numerous and, in some cases, present new and novel issues. I do not envy the staff in its task of having to guess what we intend and to “guess right” in every instance. Under our normal procedures, the Commission will not see this rule again before it is issued. Therefore, I propose that the revised rule package (with changes highlighted, if practicable) be submitted to the Commission three days prior to sending it to the Office of the Federal Register.

I appreciate the thoughtfulness with which my colleagues have approached this issue and regret that I cannot join them in supporting the establishment of acceptance criteria. I know each of us has given this matter careful consideration and I believe there was a strong desire for unanimity. I cannot reconcile, however, the establishment of these additional “acceptance criteria” with the historic regulatory treatment of beyond-design-basis scenarios. The parallels that some have attempted to draw between this rule and historic Commission policies on severe accidents and new reactors are accurate only up to a point. Although prior Commissions sought, and industry achieved, increased safety

margins and enhancements to safety features, prior Commissions did not institute acceptance criteria against which the achievement of these enhancements was judged.

I close by offering two additional comments.

I join Commissioner Jaczko in not supporting the portion of the rule mandating that for combined license applications referencing an existing design certification, the existing design certification must be amended to address the new rule's requirements. I foresee that all applicants will amend their certified designs and so this becomes a philosophical choice between letting the markets determine this outcome or having regulations force it. Even so, there is an important regulatory principle at stake. Once again, Commissioner McGaffigan got right to the heart of the matter on this one when he said the requirement for backfitting existing certified designs into the new rule "would set a terrible precedent for future Commissions." I agree.

Finally, I ask my colleagues to consider a proposal I offer related to control over potential changes to the aircraft characteristics. The draft final rule is careful to note that "[b]ecause 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.*" (Page 21, emphasis added.) I believe this is an important assurance that must be memorialized in a more enduring location than the statement of considerations. We cannot, of course, bind future Commissions in their decision-making. Although I agree with the statement I've quoted above (that the aircraft impact characteristics and the scenario used for the assessment should be fixed), future Commissions may decide to consider potential changes to the force-time curve or loading function provided to applicants for use in performing the aircraft impact assessment. Such changes would, in my view, have the potential to be so significant, and to affect regulatory certainty so dramatically -- especially when coupled with the "acceptance criteria" supported by my colleagues -- that I would propose that any changes to aircraft impact characteristics should always require formal Commission approval. It is appropriate that future Commissions should maintain visibility into the important policy considerations related to aircraft impacts. An insertion into the rule language itself, defining the aircraft impact characteristics as "Commission-approved" and therefore reserving to the Commission the approval of any potential changes to the aircraft impact characteristics, is one way to maintain this visibility. Absent a rule change, future Commissions would not be able to absolve themselves of grappling with these difficult issues.

I note also some typographical and grammatical corrections to the rule and its accompanying documents, which are attached.

  
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Kristine L. Svinicki 01/30/09

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 <sup>to</sup> 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.

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.

*undefined*

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.

OVERLY  
BLAD  
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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

carrying capacity of a wall, and the electrical capacity of power supplies.

X When identifying potential design features and functional capabilities for inclusion in the design, the designer is expected<sup>to</sup> 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. X

X 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 X

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

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 <sup>reactor</sup> 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

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 <sup>nor they</sup> 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

X 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 <sup>nor the</sup> ~~or are~~ otherwise X 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.

after the effective date of the final aircraft impact rule must utilize designs which comply with the aircraft impact rule, including those which reference one of the four currently approved design certifications, which is consistent with the commenter's assertion that all new nuclear power plants *to be constructed* must comply with the aircraft impact rule. However, with respect to the four currently approved design certifications, the NRC has determined that this objective can be achieved by requiring that these designs be updated if either: (1) one of those design certifications is referenced in a combined license; or (2) upon renewal if, at the time of renewal, that design certification has not been amended to comply with the aircraft impact rule.

The NRC believes that market forces will determine whether it is more efficient for the original design certification applicant (or another qualified entity) to re-certify the design as meeting the requirements of the aircraft impact rule or for the individual combined license applicant referencing one of the four existing design certifications to submit an application to amend the design certification or to treat the design as a custom design and submit the design in the combined license application *in toto* without having the benefit of finality and issue resolution. Thus, the NRC disagrees with the commenters to the extent that they suggest that this objective should be achieved by mandating that all four currently approved design certifications be immediately required to meet the aircraft impact rule. The final aircraft impact rule reflects these NRC determinations.

*Comment: The proposed rule should apply to all currently approved design certifications. The requirements are necessary in order to ensure adequate protection of the public health and safety. Even if they are not necessary for adequate protection, the NRC should apply the proposed rule to the current design certifications. It would be imprudent for the NRC to allow a reactor to be built with less than the most current, up-to-date safety and security information and technology, such as those discussed in NUREG/CR-1345, "Nuclear Power Plant Design Concepts for Sabotage Protection," inasmuch as the NRC implicitly recognizes that applying the requirements of this rule would enhance overall safety and security of the reactor. Moreover, not applying the rule to currently-approved design certifications would contradict and undermine the objective of the rule. A designer for a new reactor would have significant economic disincentives to adopt potentially advantageous design features, functional capabilities or strategies, inasmuch as the four existing design certifications would not have to reflect the cost of such additional features. (NYS AG-17-2a, UCS-29-2)*

NRC Response: The NRC agrees in part with the commenters, to the extent that the commenters assert that all newly designed and constructed nuclear power plants should be required to meet the aircraft impact rule. As discussed in response to the previous comment, and in the statement of considerations for the final rule, under Section III, "Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications," the NRC has decided that all newly designed and constructed nuclear power plants must utilize designs which comply with the aircraft impact rule, including those which reference one of the four currently approved design certifications. This NRC's decision is consistent with the commenter's assertion that all new nuclear power plants to be constructed must comply with the aircraft impact rule. However, with respect to the four currently approved design certifications, the NRC believes that this objective can be achieved by requiring these design certifications if either: (1) one of those design certifications is referenced in a combined license; or (2) upon renewal if, at the time of renewal, that design certification has not been amended to comply with the aircraft impact rule.

The NRC agrees with the commenters that the designers of a new reactor may face some economic disincentives to adopt potentially advantageous design features, capabilities or strategies, inasmuch as these could increase the cost of design and the cost of constructing a nuclear power plant based upon the design. However, the NRC believes that these economic disincentives will be offset by market demand for reactor designs that are more robust and have been designed in accordance with the aircraft impact rule. The NRC's views in this regard are reinforced by some of the comments of industry stakeholders, see *UniStar-26-4, GEH-28-1, Westinghouse-31-1*. In any event, the NRC has concluded that the best regulatory approach would be to require these design certifications be required to comply with aircraft impact rule, but only if the design is referenced in a combined license, or if the certification is renewed. Thus, the NRC believes that the final rule achieves the underlying objective of the commenter, but in a less regulatory burdensome manner. The final aircraft impact rule reflects these NRC determinations.

*Comment: The proposed rule should apply to all currently approved design certifications. Over 15 years prior to the certification of these designs, the NRC had published NUREG/CR-1345, Nuclear Power Plant Design Concepts for Sabotage Protection (1981). The NRC failed to apply the protective strategies garnered by a Design Study Technical Support Group, which was comprised of representatives of Combustion Engineering, General Electric, and Westinghouse. Thus, known sabotage-resistant enhancements were not incorporated into the current design certifications. The NRC should not compound its mistake in failing to consider this report when certifying the existing designs, by exempting the four current design certifications from the aircraft impact rule. To do otherwise would give the appearance that the NRC is interested more in cost containment for the industry rather than protecting public health and safety and common defense and security. (UCS-29-3, Beyond Nuclear-3-3, Pilgrim Watch-4-6)*

NRC Response: The NRC agrees in part with the commenters, in that the final rule requires the four currently approved design certifications to comply with the aircraft impact rule, but only if either: (1) one of those design certifications is referenced in a combined license; or (2) upon renewal if, at the time of renewal, that design certification has not been amended to comply with the aircraft impact rule. As discussed in response to previous comments, and in the final rule statement of considerations, under Section III, "Currently Approved Standard Design Certifications and Combined Licenses Referencing These Certifications," the NRC has decided that all nuclear power plants designed and constructed after the effective date of the final aircraft impact rule must utilize designs which comply with the aircraft impact rule, including those which reference one of the four currently approved design certifications. The final aircraft impact rule reflects these NRC determinations.

The commenter's assertions regarding the NRC's actions with respect to NUREG/CR-1345 and sabotage protection are outside the scope of this rulemaking. No change was made to the final rule as a result of these comments on NUREG/CR-1345.

*Comment: The proposed rule should apply to all currently approved design certifications. The NRC's proposal to rely upon voluntary enhancement of the current design certifications is inadequate for protecting public health and safety and common defense and security. "Voluntary" efforts do not work in a timely manner, and are not a substitute for regulatory*

requirements. Inasmuch as none of the design certifications have yet to be utilized in a constructed reactor, there is still an opportunity to incorporate changes into the design certifications before construction of a reactor utilizing a certified design, thereby avoiding more expensive retro-fits at a later date. The industry and the NRC have the time and the wherewithal to modify these designs to address aircraft impacts. If the aircraft impact rule is not applied to the currently approved design certifications, potentially as many as seven of the first ten new nuclear plants slated to be licensed by the NRC would not be required to comply with the propose rule. This would further damage the public confidence in the industry and the agency which purports to regulate it. Moreover, even the nuclear industry recognizes this adverse impact on public confidence, as reflected in Westinghouse's proposed change to the AP1000 design certification to line the interior and exterior of the concrete containment with steel plates to increase resistance to aircraft penetration. (NEIS-32-5; Greenpeace-19-2a, 2b)

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NRC Response: The NRC acknowledges the commenters' view that public confidence may be damaged if the aircraft impact rule is not applied to future-constructed nuclear power plants. In developing the final rule, the staff concluded 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 - are not required to comply with the aircraft impact rule. The NRC also agrees with the commenters that voluntary efforts to comply with the aircraft impact rule are not an acceptable regulatory alternative to the adoption of a regulatory requirement mandating compliance with the aircraft impact rule, but not for the reasons expressed by the commenters. Instead, 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 ~~these~~ 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 Power Plants" (52 FR 34884; September 15, 1987). Accordingly, as discussed earlier, the NRC has decided to require in the final aircraft impact rule that the four currently approved design certifications ~~to~~ comply with the aircraft impact rule, but only if either: (1) one of those design certifications is referenced in a combined license; or (2) upon renewal if, at the time of renewal, that design certification has not been amended to comply with the aircraft impact rule. X  
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The NRC selected this regulatory approach because it believes that regulatory requirements should be imposed in a manner which preserves standardization while minimizing unnecessary expenditure of NRC and industry resources. It makes little sense for the NRC to require that an existing design certification be updated to comply with the aircraft impact rule if there is little likelihood that the design certification will actually be utilized in the U.S. The NRC believes that the final rule establishes a good regulatory framework for achieving the ultimate objective sought by the commenter, but in a manner which avoids unnecessary expenditure of applicant and NRC resources. The final aircraft impact rule reflects these NRC determinations.

space → X  
Comment: Terrorist factions come in waves and eventually disappear by arrest, political solutions or societal developments (see urban guerillas in Germany in the 1970s). The current, very dangerous threat is now and may persist in the next 10 to 20 years. Therefore a limitation of the rule to new standard design certifications, etc. is inappropriate, since current COLs are not included. (Schmidt-6-1 - portion) X

include the airplane crash assessment in the amendment. (Westinghouse-31-1)

NRC Response: No response necessary.

*Comment: In addition to the NRC's inherent authority to promulgate rules under the Atomic Energy Act, 10 CFR 52.63(iii), (vi) and (vii) authorize the NRC to impose new requirements on existing design certifications in the present circumstances. Specifically, applying proposed 10 CFR 52.500 to all designs referenced by a combined license applicant would contribute to increased standardization of the certification information. Because no new plants have been constructed and no combined licenses referencing a previously-certified design have been issued, application of proposed 10 CFR 52.500 would increase standardization by avoiding the need for individual combined license applicants to address aircraft impacts (either in individual licensing proceedings or as part of compliance with proposed 10 CFR 73.55). Along these lines, consistent application of the proposed rule would also reduce unnecessary regulatory burden by resolving aircraft impacts issues in a single licensing review for the certified design rather than in numerous combined license reviews. The change would also substantially increase overall safety and security of the design under the same cost-benefit calculus that applied to other design certification applicants. (UniStar-26-5)*

X NRC Response: The NRC interprets <sup>the</sup> this comment as suggesting that the final aircraft rule require the immediate imposition of rule's requirements to the four currently approved design certifications. The NRC agrees with the commenter that resolving aircraft impact issues in a single design certification amendment proceeding is preferable to resolution of that subject in individual licensing proceedings, because it reduces unnecessary regulatory burden. However, were the NRC to adopt the commenter's implicit proposal for immediate imposition of the rule's requirements on the four currently approved design certifications, this may result in the original applicants of those design certifications which have little or no commercial prospect of being utilized in the U.S. incurring the unnecessary cost of compliance with the aircraft impact rule. The NRC has determined that the final rule's alternative approach is preferable. The final aircraft impact rule provides several procedural alternatives which will result in the NRC's objective being achieved, and which may also be consistent with the commenter's views. X

*Comment: Section 52.500 (a) should be amended to clarify that COL applicants that are referencing design that was certified before the effective date of the aircraft impact rule should perform the assessment, unless the design entity agrees voluntarily to perform the assessment and submit an amendment to the certified design. (NEI-23-4)*

NRC Response: The NRC agrees in part with the commenter that combined license applicants referencing one of the four currently approved design certifications should comply with the aircraft impact rule if the design has not already been amended to comply with the aircraft impact rule. However, the NRC disagrees with the commenter's implicit suggestion that the assessment performed by the combined license applicant should be considered a plant-specific design matter, and therefore be regarded as separate from the referenced design certification. As discussed in the statement of considerations for the final aircraft impact rule, the Commission believes that public confidence, finality considerations, and the NRC's standardization policies favor a regulatory regime whereby all combined licenses, if referencing a design certification, must reference a design certification which complies with the aircraft impact rule. The final aircraft impact rule reflects these NRC determinations, but provides a

## VI. Aircraft Impact Assessment

*Comment: Dry cask storage areas should be considered as part of the assessment of the effects from large, commercial aircraft impacts. (NYS OHS-13-2)*

NRC Response: The NRC disagrees with this comment. The scope of this rule is limited to new nuclear power reactors under 10 CFR Parts 50 and 52 and does not apply to dry cask storage facilities licensed under 10 CFR Part 72. As with new power reactors, current requirements for dry cask storage facilities provide adequate protection of the public health and safety and the common defense and security. No change was made to the final rule as a result of this comment.

*Comment: The aging process of nuclear plants and the changes that occur due to time, and exposure to very high heat, corrosive and radioactive substances should be taken into account when considering the vulnerability of the plant to aircraft impacts. (Rivard-24-1)*

NRC Response: The NRC disagrees with this comment. The NRC has determined that the requirement for assessment of large, commercial aircraft impacts is not an aging-related matter. The safety related equipment and components at a nuclear power plant are housed in robust concrete and steel structures. The NRC has done extensive research to determine the effects of aging and impact of environmental conditions present at a nuclear power plant on these structures. The results of these studies indicate that the load carrying capacity of these structures is not degraded significantly due to aging. In fact, the load carrying capacity of concrete structures increases with time. In addition, the aircraft vulnerability assessment requirements specified by the NRC, including loads from a large commercial aircraft, are sufficiently conservative to offset any small decrease in load carrying capacity of steel structures due to any detrimental aging effects. No change was made to the final rule as a result of this comment.

*Comment: The commenter disagrees with the NRC's view that the assessment of large, commercial aircraft is not an aging-related matter. Reactor components age, and such progressive aging does not leave them in better, more durable or "robust" condition from the standpoint of metallurgy or functionality. Aircraft impacts would introduce unanticipated vibrations, forces and effects on already-aging and stressed components. The NRC should rethink the synergies between component aging and aircraft impacts. (NEIS-32-6)*

X NRC Response: The NRC generally agrees with the commenter's implicit assertion that aging of long-lived reactor components may result in some reduction in their capability to withstand the effects of an airplane impact. Furthermore, the NRC agrees with the commenter's apparent position that a renewal review will include a review as to whether the aging of long-lived passive structures, systems, and components identified by the designer as a result of the aircraft impact rule is adequately managed during the renewal term. However, the NRC wishes to make clear that the occurrence of such aging does not transform aircraft impacts into an aging-related matter, such that the aircraft impact assessment and evaluation must be re-performed at the time of license renewal. This follows from the objective of, and bases for, the license renewal review under 10 CFR Part 54. The objective of the renewal review under 10 CFR Part 54 is to ensure that there is a regulatory review at license renewal of those matters for which the NRC's ongoing regulatory processes during the term of the operating license, if continued into the X

assessments, including shock, should be based on practical and realistic assumptions. The NRC is considering endorsement of guidance developed by NEI to provide a consistent approach to the assessment. Details of methodology and approach for assessments are not necessary in the rule, but rather are more appropriate in guidance documents. No change was made to the final rule as a result of this comment.

*Comment: Realistic assumptions should be used in performing the assessment of the plant response to the impact. While the Commission affirms its support for the use of realistic assumptions, the rule itself is silent regarding this aspect of the assessment. The rule should be explicit in this regard. The commenters provided specific suggestions as to how the proposed rule language may be modified to reflect their' recommendation. (NEI-23-8; AREVA NP-15-5)*

*Comment: The proposed rule should be revised to clarify that the impact assessment may use realistic assumptions regarding the performance of the plant. Consistent with the nature of the rule and evaluation of beyond-design-basis accidents in general, the rule should explicitly state that the evaluation may be performed using realistic assumptions regarding the performance of plant design features, functional capabilities, and strategies, rather than conservative assumptions that are typically used in evaluations of design basis accidents. The statement of considerations allows for the use of realistic assumptions. See id. at 56,292. However, the rule language itself does not reflect this concept. Given the importance of this issue, the commenter recommends that proposed 10 CFR § 52.500(b) be revised to incorporate this concept, and provided suggested changes to the proposed rule's language to reflect the commenter's recommendation. (Morgan Lewis-10-6)*

NRC Response: The NRC disagrees that the rule language should be revised to clarify that the impact assessment may use realistic assumptions. As some commenters pointed out, the statement of considerations in the proposed rule stated that the methods and acceptance criteria used in the aircraft impact assessment should be based on realistic assumptions. This statement remains in the final rule. The NRC does not agree that this level of detail is appropriate for inclusion in the rule language itself. More details regarding the assumptions made in performing the assessment can be found in NRC guidance documents. No change was made to the final rule as a result of these comments.

## VII. Evaluation of Design Features, Functional Capabilities, and Strategies

*Comment: The proposed rule should be revised to clarify that an applicant need only provide protection for containment integrity or for core cooling; both functions need not be simultaneously protected. If core cooling is maintained, there will be no significant releases to the public, even if containment integrity is breached. As long as the core is adequately cooled, the source term will be low and will not present a threat to the public health and safety. Similarly, if containment integrity is maintained, there will be no significant releases to the public, even if core cooling is lost. As provided in the footnotes to 10 CFR § 52.47(a)(2)(iv) and § 52.79(a)(1)(vi), the containment must be able to perform its function assuming a major accident, such as a core melt. Such an accident, by its nature, assumes loss of core cooling. Therefore, if containment integrity is maintained following an aircraft impact, sufficient protection is provided to the public during such a beyond-design-basis accident. This recommendation*

an aircraft impact than if they were designed in the absence of this final rule. No change was made to the final rule as a result of this comment.

*Comment: The rule should require the adoption of design features that would enable the applicant to ensure no release in excess of 10 CFR Part 100 limits. The applicant should only be allowed to assume outside assistance after a period of 72 hours. (Coldren-8-7)*

NRC Response: The NRC disagrees with the commenter. The NRC decided not to adopt an additional acceptance criterion based on 10 CFR Part 100 dose limits in the final rule because the 10 CFR Part 100 limits are limits that the NRC uses, as a matter of historical practice, to judge compliance with design basis requirements. 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 the aircraft impact rule. The NRC's approach to aircraft impacts is consistent with its previous approach to beyond-design-basis events. 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), 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, containment integrity, spent fuel cooling, and spent fuel pool integrity. Additional guidance regarding the parameters of the aircraft impact assessment will be provided in regulatory guidance. No change was made to the final rule as a result of this comment.

*Comment: The rule should define "reduced reliance on operator actions." The rule should state the baseline for the measure of the reduction and details of the methodology should be provided in publicly available guidance documents. The rule should describe why operator actions are not desirable. (Coldren-8-9, Halac-1-11)*

*SPACE*  
*X* → NRC Response: The NRC agrees in part with the commenter that the final rule should provide more information on what is meant by "reduced reliance on operator actions." In the statement of considerations for the final rule, the NRC has provided additional details on what is meant by the requirement to identify design features and functional capabilities that avoid or mitigate the aircraft impact with "reduced reliance on operator action." This means that active operator intervention and initiation of responsive action to maintain core cooling, containment integrity, spent fuel cooling, 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 in controlling the reactor and the nuclear facility. Any design enhancement that can reduce the need for operator action is viewed as desirable because it reduces the potential for human error during the response to an event.

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*Comment: The NRC should require new reactors to be designed to successfully withstand a*

*deliberate aircraft impact into sensitive reactor structures, rather than merely asking the reactor designers to consider what design features they might be willing to include in the design to reduce aircraft impact risks. (CBG-22-2)*

NRC Response: The NRC disagrees that it should require new reactors to be designed to successfully withstand a deliberate aircraft impact into sensitive reactor structures. As discussed in the statement of considerations for this final rule and in responses to comments above, the NRC determined that the impact of a large, commercial aircraft is a beyond-design-basis event and therefore are not considered necessary for reasonable assurance of adequate protection to public health and safety. Thus, it is not necessary to require new reactors to withstand the impact of a large commercial aircraft, for purposes of providing reasonable assurance of adequate protection. Rather, this rule's goal is to enhance the facility's inherent robustness at the design stage. No change was made to the final rule as a result of this comment.

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*Comment: Piping which is routed between two buildings, e.g. the reactor and auxiliary buildings, (especially reactor coolant pipes) must be designed with shock absorbing anchor points set sufficiently apart to allow for a rapid movement of the pipes caused by explosions or aircraft impact. This design consideration would not be limited to aircraft fuel explosions but also account for surface bombs and explosive laden aircraft. The key consideration is that the lateral acceleration caused by an aircraft impact or by explosives can far exceed the earthquake-proofing measures currently employed at nuclear plants. (TMI Alert-12-1)*

*Additional electrical supplies to maintain or regain control of the reactor must be constructed. These would include underground power lines and a secondary set of Emergency Diesel Generators located far from the other set. (TMI Alert-12-2)*

*Additional electrical busses should be built into various buildings so that a mobile diesel generator can drive to the area that is experiencing a station blackout, plug into the busses and restore power. These mobile generators would be parked far enough away from the reactor to remain undamaged during an aircraft impact and fire. (TMI Alert-12-3)*

*All safety related storage tanks, and especially the diesel fuel tanks, must be protected from flying missile debris. These tanks must be located far enough from other buildings to prevent additional fires or the release of hazardous gases, liquids or materials which would impede the responders' ability to provide mitigating action. (TMI Alert-12-4)*

*The nuclear fuel systems should be redesigned so that new and spent fuel is stored below ground level. Fuel canals and crane systems can be redesigned to transport fuel assemblies between the increased difference of the reactor's elevation to the fuel storage and spent fuel storage elevations. The fuel buildings must be strengthened. (TMI Alert-12-5)*

*We remind the Commission that electrical wiring has never been tested under "accident conditions" whereby temperatures may exceed the limits of the electrical cables causing catastrophic failure. Therefore, with regard to this rule, all new designs should only incorporate electrical cables which have been tested to meet accident condition stresses which can account for the temperatures of nearby aircraft fires and the thermal effects within a building*

*enhancements such as physically separating the emergency diesel generator room and locating them on different sides of the reactor site. (Beyond Nuclear-3-4a, Pilgrim Watch-4-7)*

NRC Response: To the extent that the commenter believes that future reactor designers should be aware of and utilize NUREG/CR-1345 to inform the assessment required under Section 50.150(b), the NRC agrees with this comment. Moreover, to the extent that the commenter believes that the NRC staff should be aware of this information when conducting its implementation oversight of the rule, the NRC also agrees with this comment. However, if the commenter believes that the aircraft impact rule should prescriptively require the applicant to utilize NUREG/CR-1345 and similar studies, then the NRC disagrees with the comment. As discussed previously, the NRC has decided that a more performance-based rule is desirable in this regulatory situation. No change was made to the final rule as a result of this comment.

*Comment: The proposed rule must address previous criticisms of typical aircraft hazards analysis where reasonable assurance is undermined by the lack of clear and supported statements on key underlying assumptions. (Beyond Nuclear-3-4.b, Pilgrim Watch-4-8)*

NRC Response: The NRC does not agree that the rule must address key underlying assumptions for the aircraft impact assessment required by the rule. That level of detail is more appropriate for guidance documents. Without specific details about which previous criticisms the commenter believes should be addressed by the rule, the NRC is unable to respond further. No change was made to the final rule as a result of these comments.

*Comment: The final rule must require that licensees install the security improvements identified as a result of the required assessment and evaluation. Assessments, by themselves will not improve security if improvements are totally discretionary and the plant owners choose not to install the designated improvements. (Northern Lights-18-8)*

NRC Response: The NRC agrees with the commenter. The final rule requires applicants to perform a design-specific assessment of the effects on the facility of the impact of a large, commercial aircraft. The final rule then requires applicants 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 [emphasis added].

*Comment: Public acceptance of new nuclear requires a clearly-articulated standard for evaluating designs to ensure not only a consistent level of safety, but also a consistent method for evaluating their safety. UNE therefore urges the NRC to adopt a clearly-articulated standard that is transparent and scrutable to members of the public. Under the proposed rule, an applicant must describe "design features, functional capabilities, and strategies that avoid or mitigate, to the extent practicable, the effects of the applicable aircraft impact with reduced reliance on operator actions." The primary shortcomings of relying solely on the practicability standard are its ambiguity and subjectivity. An ambiguous standard that fails to convey the extent to which a design addresses aircraft impacts may not engender public confidence in the safety of new reactor designs. Similarly, an overly-subjective standard may prove difficult to apply consistently given differing designs with various approaches to evaluating aircraft impacts. Accordingly, UNE recommends that the NRC adopt the following functional acceptance criteria: (1) Demonstrate that the reactor core remains cooled or the containment remains intact, and (2) Spent fuel cooling or spent fuel pool integrity is maintained. For designs*

necessary. Thus, the NRC has not adopted any changes in either the final aircraft impact rule, or in 10 CFR Parts 52 or 54, that would require reconsideration of aircraft impacts at the renewal stage of any license, approval or design certification.

*Comment: The final rule should clarify that the design features and related mitigation measures incorporated into the design as the result of the aircraft impact rule are part of the design certification, and are not part of the physical security requirement of the plant. Consequently, these design features and mitigation measures would not be subject to review at the time of the COL. (NEI-23-2)*

NRC Response: The NRC agrees with the commenter 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*. The concept of issue resolution and finality would be undercut if the NRC were to permit a re-review at the combined license stage of design features and functional capabilities which were identified under the aircraft impact rule and included in the referenced design certification.

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However, the NRC disagrees with the commenter's apparent view that design features and related mitigation measures 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 aircraft impact rule does not require consideration of physical security concerns in identifying design features and functional capabilities. Hence, the NRC's approval of the design can logically extend only to compliance with the aircraft impact rule's requirements, and cannot be a basis for concluding that the overall plant meets the physical security requirements in 10 CFR Part 73. The NRC recognizes that the NRC's review of the plant's physical security at the combined license application stage must take into account the design features and functional capabilities incorporated into the design as a result of the aircraft impact rule, and that no change to those already-approved design features and functional capabilities can be made as a result of the physical security review at the combined license stage. Nonetheless, the NRC does not believe that it is accurate to say that aircraft impact rule design features and functional capabilities are "not subject to review" at the combined license application stage. No change was made to the final rule as a result of this comment.

#### **IX. Protection of Safeguards Information and Other Sensitive Information Associated with the Aircraft Impact Rule**

*Comment: The proposed rule should not contain the "design basis scenarios" (e.g., the size and speed of the aircraft postulated to impact the facility) describing exactly the parameters to be protected in aircraft impacts, or the details of the design features that may be incorporated*

NEI proposed in its December 8, 2006 letter is irrelevant to the issues raised in this rulemaking. This comment did not propose any change to be included in the final rule, and, therefore, no change was made to the final rule as a result of this comment.

*Comment: Applicants should submit a summary level description and not details of the design features and mitigation actions as part of the application. Submitting the details would be inconsistent with the treatment of the other specific beyond design-basis requirements listed in Part 52. In addition, for aircraft impact, it would result in the submittal being classified as a Safeguards document. Consistent with the treatment of submittals on other specific beyond design-basis events, the details would be available for NRC audit and inspection. (NEI-23-14)*

NRC Response: The NRC generally agrees with the commenter that applicants should submit a summary level description of the design features and functional capabilities as part of their application, consistent with the treatment of other beyond-design-basis requirements in 10 CFR Part 52. However, the NRC does not agree that applicants should base their decision about the level of detail to include in their application on whether that level of detail would be considered SGI. Although it may be desirable to limit the amount of information in an application classified as SGI to allow the public access to as much information as possible, applicants must be guided by the requirements of the final rule in determining what level of information is necessary to include in their applications. If portions of the application must contain safeguards information, then the applicant must follow 10 CFR 2.390, "Public inspections, exemptions, requests for withholding," and existing NRC procedures and guidelines on transmitting that information to the NRC. No change was made to the final rule as a result of this comment.

#### **X. Compliance with the National Environmental Policy Act (NEPA)**

*Comment: The NRC must prepare an EIS examining the environmental effects of its rulemaking, including its exclusion of currently-operating power reactors and currently approved design certifications, because the proposed rule is a "major federal action." The proposed rule is a major federal action because it bears directly on the degree to which public health and the environment will be protected against the impacts of aircraft attacks. This is supported by a decision of the U.S. Court of Appeals for the 9<sup>th</sup> Circuit in **San Luis Obispo Mothers for Peace v. NRC**, 449 F3d 1016 (2006)(SLOMP). In ~~SLOMP~~, the 9<sup>th</sup> Circuit ruled that the NRC's decision to categorically exclude the potential impacts caused by an attack on a dry cask storage system was irrational given the NRC's recognition (elsewhere) of the possibility of such intentional actions (NYS AG-17-5a)*

SLOMP

NRC Response: The NRC disagrees with the commenter that an environmental impact statement (EIS) must be prepared for this rulemaking. The commenter incorrectly believes that the NRC determination not to prepare an EIS for the proposed aircraft impact rule was based upon a conclusion that the rulemaking does not constitute a "major federal action." In fact, the NRC's determination was based upon the conclusion that the proposed rulemaking was not a major federal action *significantly affecting the environment*. As discussed in the environmental assessment (EA), the NRC determined that there would be no adverse environmental impacts attributable to the rule *per se*, inasmuch as: (i) the rule applies to designers of nuclear power reactors, and a design, by itself, does not have any effect upon the environment unless it is

utilized in a reactor that is being built; (ii) the rule's requirements do not affect the nuclear power plant's capabilities with respect to radiological releases from design bases events, including postulated accidents; (iii) the standards and requirements applicable to radiological releases and effluents are not affected by this rulemaking, and would therefore have no adverse environmental impact. Finally, although not mentioned in the EA, the NRC believes that this rule has the potential effect of increasing environmental protection by requiring reactor designers to consider and implement design features and functional capabilities to address aircraft impacts. By doing so, there would be a potential decrease in the possibility of radiological releases to the environment stemming from an aircraft impact on a nuclear power plant, which effectively increases the level of environmental protection provided. The EA was made available to the public for comment as part of the notice and comment opportunity for the proposed rule. The commenter provided no specific analysis of that discussion in the EA, nor did the commenter identify any error in the EA that would lead to the conclusion that the proposed rule would significantly affect the environment. The NRC is issuing a revised EA with the final rule to reflect the last rationale mentioned above.

X The 9<sup>th</sup> Circuit decision cited by the commenter is inapposite to the NRC's decision not to prepare an EIS for the proposed aircraft impact rule. In ~~SLOMP~~<sup>SLOMFP</sup>, the 9<sup>th</sup> Circuit decision addressed the four reasons presented by NRC as to why an EIS for a proposed NRC issuance of a license for an independent spent fuel storage installation (ISFSI) need not address the potential environmental impacts of an attack on the ISFSI. The NRC's bases, as articulated by the 9<sup>th</sup> Circuit, were that: (1) such attacks were remote and speculative; (2) an analysis of the probability of such attacks would be meaningless; (3) NEPA does not require a worst-case analysis; and (4) NEPA is not an appropriate forum for addressing sensitive security issues. These matters did not involve the issue of whether issuance of a license for the ISFSI significantly affected the environment. Moreover, the ~~SLOMP~~<sup>SLOMFP</sup> decision involved the exercise of NRC's licensing authority, rather than its rulemaking authority. For these reasons, the NRC believes that the 9<sup>th</sup> Circuit's decision in ~~SLOMP~~<sup>SLOMFP</sup> is of no relevance to, and does not address, whether the aircraft impact rule requires preparation of an EIS. X X

The NRC continues to believe that adoption of the proposed rule does not constitute a major federal action significantly affecting the environment. Therefore, an EIS was not prepared for the final aircraft impact rulemaking. No change was made to the EA or the Finding of No Significant Impact as a result of this comment.

*Comment: The EIS for the proposed rule must consider alternatives to the proposed rule which would reduce the environmental impacts attributable to an aircraft impact on a nuclear power plant and spent fuel facilities [located at the plant]. (NYS AG-17-5b)*

NRC Response: The NRC disagrees. Inasmuch as the NRC concludes that the proposed aircraft impact rule, if implemented, would not constitute a major federal action significantly affecting the environment, there is no legal requirement under NEPA to consider alternatives to the proposed rule, including alternatives which, arguably, may result in more diminished effects on the environment as compared with the proposed rule. No change was made to the EA or the Finding of No Significant Impact as a result of this comment.

*Comment: The NRC must prepare an EIS, because the NRC has an affirmative duty to carry out NEPA's mandate for full public disclosure of reasonably foreseeable environmental effects*