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STATE OF NEW YORK
OFFICE OF THE ATTORNEY GENERAL

OFFICE OF SECRETARY
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Annette L. Vietti-Cook
Secretary
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

December 17, 2007

Re: *RIN 3150-AI19, 10 C.F.R. Part 52, Impacts of Large, Commercial Aircraft*

Dear Secretary Vietti-Cook:

Enclosed please find comments submitted on behalf of the State of New York concerning the proposed amendment to the NRC's regulations to require applicants for certain new reactors to assess the impacts of large, commercial aircraft during the design phase of such reactors.

We will be happy to discuss the concerns with NRC Staff at any mutually convenient time. Thank you for your consideration of the enclosed comments.

Respectfully submitted,

s/

Morgan A. Costello
John J. Sipos
Assistant Attorneys General

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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In the Matter of:

NRC Docket No.
RIN 3150-AI19

Amending 10 C.F.R. Part 52 and Promulgating
a Rule Requiring:

Consideration of Aircraft Impacts for a Few,
New Nuclear Reactors.
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**NEW YORK STATE'S COMMENTS CONCERNING
NRC PROPOSED RULEMAKING TO AMEND 10 C.F.R. PART 52
TO REQUIRE CERTAIN APPLICANTS TO CONSIDER
AIRCRAFT IMPACTS TO FUTURE NUCLEAR POWER PLANTS**

On behalf of the State of New York, the Attorney General of the State of New York submits these comments regarding the Nuclear Regulatory Commission's ("NRC") proposal to promulgate a new regulation that would require applicants seeking permission to construct and operate a new nuclear power reactor, the design of which is not currently pre-approved, to assess the effects of the impact of a large, commercial aircraft crashing into the nuclear power plant.

New York supports requiring applicants for new nuclear power reactors to assess aircraft impacts and to include in their applications a description and evaluation of design features, functional capabilities, and strategies to avoid or mitigate the effects of such impacts. However, the NRC's current proposal is too little, too late. It is too little because it does not require applicants to assess the structural and environmental consequences caused by smaller jet or general aviation aircraft crashes. It is too late because it exempts the vast majority of nuclear reactors that are located – or will be located – in this nation for the foreseeable future.

Such exemptions are contrary to Atomic Energy Act's directive to the NRC to protect the health and safety of Americans and their environment. The NRC's proposed exclusion from the proposed rule of currently operating nuclear reactors, as well certain pre-approved standard reactor design certifications, is inconsistent with the Atomic Energy Act, the NRC's treatment of similar threats, and the evidence before the agency regarding the vulnerability of existing nuclear power plants to attacks using explosive devices, including aircraft. The loophole will erode the public's confidence in the NRC and do nothing to protect the approximately 100 existing reactors and the four pre-approved reactor models.

Rather than proceed with the current anemic proposal, New York State urges the NRC to expand the scope of the regulation to include all commercial aircraft and apply it to all nuclear reactors and associated facilities. To fulfill its statutory mandate to ensure adequate protection of public health and safety and to minimize danger to life and property, the NRC must require all licensees and applicants to examine the consequences of all air-based threats, including explosions and threats caused by the crash of a large, commercial aircraft. Consequently, the NRC must expand the proposed aircraft impact assessment rule to include all currently operating nuclear power reactors and all reactors constructed in the future. Further, the NRC must mandate that all existing and future nuclear power plants be designed to withstand airborne attacks.

In addition, the National Environmental Policy Act (“NEPA”) requires the NRC to prepare an environmental impact statement studying the effects of its rulemaking, including the impact of terrorism, and how this proposed rule – which may never actually come into play – will protect Americans, their environment, and their property from air-based threats.

I. BACKGROUND INFORMATION

The Atomic Energy Act, 42 U.S.C. § 2011 *et seq.*, requires the NRC to ensure that nuclear power plants are secure against sabotage and other deliberate attacks. In particular, the NRC must determine that the operation of a facility is “in accord with the common defense and security and will provide adequate protection to the health and safety of the public.” 42 U.S.C. § 2232(a). In addition, the Atomic Energy Act authorizes the NRC to prescribe regulations necessary “to govern any activity authorized pursuant to this chapter, including standards and restrictions governing the design, location, and operation of facilities used in the conduct of such activity, in order to protect health and to minimize danger to life or property.” *Id.* at § 2201(i)(3).

A. Pre-9/11 Protection of Nuclear Power Plants

The “design basis threat” or “DBT” regulation, 10 C.F.R. pt. 73, requires facility owners to establish and maintain a “physical protection system” and to design “safeguard systems” that guard against acts of radiological sabotage or theft of nuclear material. 10 C.F.R. § 73.1(a). It sets forth the specific “design basis threats” — “general adversary characteristics” such as the number of attackers, weapons attackers may have, and vehicles attackers might use — that a facility owner must be prepared to defeat with high assurance. 72 Fed. Reg. at 12,705.

The DBT regulation was first promulgated in 1977. Final Rule, *Requirements for the Physical Protection of Nuclear Power Reactors*, 42 Fed. Reg. 10,836 (Feb. 24, 1977). The original rule required power reactor licensees to protect against only three external attackers, working as a single group, moving on foot, and using hand-carried weapons, with the possible assistance of one insider. *See id.* at 10,838-39.

In 1991, Committee to Bridge the Gap ("CBG") submitted a rulemaking petition requesting that the DBT rule be amended to include explosives-laden vehicles and a larger number of attackers. Notice of Receipt of Petition for Rulemaking, 56 Fed. Reg. 3,228 (Jan. 29, 1991). The NRC rejected the petition, concluding that any change in the DBTs was unwarranted because "the likelihood of nuclear terrorism involving the use of large truck bombs against nuclear power reactors is extremely low." Denial of Petition for Rulemaking, 56 Fed. Reg. 26,782, 26,785 (June 11, 1991). The NRC explained that it focuses on "realistic, not hypothetical, adversary characteristics," and that it "compares what has occurred or is credible to the attributes enumerated in the design basis threats." *Id.* Although its threat assessment at that time revealed that it was not realistic to assume a truck bomb would be used in the United States, the NRC stated that it would "propose appropriate changes to the design based threat" if the "domestic threat environment [were to] change significantly." *Id.* at 26,785-86.

Less than two years later, terrorists detonated explosives contained in a rented van in the underground garage of the World Trade Center in lower Manhattan. In the wake of the terrorists' proven capacity to use a truck bomb inside the United States, the NRC quickly revised the DBT rule to add protections against land-based vehicular bomb attacks. Final Rule, *Protection Against Malevolent Use of Vehicles at Nuclear Power Plants*, 59 Fed. Reg. 38,889 (Aug. 1, 1994). According to the NRC, the World Trade Center bombing "represented a significant change to the domestic threat environment" that "eroded the basis for concluding that vehicle bombs could be excluded from any consideration of the domestic threat environment." *Id.* at 38,890. As the NRC explained it, "[f]or the first time in the United States, a conspiracy with ties to Middle East extremists clearly demonstrated the capability and motivation to organize, plan, and successfully conduct a major vehicle bomb attack." *Id.*

It has long been known that an airborne attack on a nuclear power plant could be catastrophic. In the recent DBT rulemaking proceeding, the Nuclear Energy Institute ("NEI") candidly acknowledged that nuclear power plants were not designed to withstand the impact of a large commercial airliner. See 2/22/06 Comments of NEI to NRC in RIN 3150-AH60, at Enclosure 2, p. 10; *NRC: Nuclear Power Plants Not Protected Against Air Crashes*, Associated Press (Mar. 28, 2002); Director's Decision Under 10 C.F.R. § 2.206, at 12, *In the Matter of All Nuclear Power Reactor Licensees*, DD-02-04 (Nov. 1, 2002), available at <http://www.nrc.gov/reading-rm/doc-collections/petitions-2-206/directors-decision/2002/ml022890031.pdf>. A number of the nation's operating reactors were designed more than 40 years ago. For example Oyster Creek, Vermont Yankee, and Indian Point Unit 2 and Unit 3 were designed back in the 1960's. At various facilities, the spent fuel pools are cantilevered on the side of the reactor building several stories above the ground.

Even a small plane could cause serious problems. A 1974 peer-reviewed study by a General Electric engineer, for example, concluded that if a plane weighing more than

12,500 pounds — a tiny fraction of the weight of today's commercial airliners¹ — were to hit a reactor building in the right place, it would likely breach the containment structure and damage the reactor core and cooling systems. Ian B. Wall, *Probabilistic Assessment of Aircraft Risk for Nuclear Power Plants*, 15 Nuclear Safety 276 (1974) [hereinafter *GE Study*].

Researchers at the Argonne National Laboratory reached similar conclusions in a 1982 study conducted for the NRC. NRC, *Evaluation of Aircraft Crash Hazards Analyses for Nuclear Power Plants*, NUREG/CR-2859 (1982) [hereinafter *Argonne Study*]. The report explained that “[n]umerous systems are required in order to provide reactor shutdown and adequate long-term cooling of the core. Although many of these safety-related systems are well protected within hardened structures (containment system, auxiliary building), some are not.” *Id.* at 50. Thus, an aircraft crash that caused “rapid depressurization of the plant’s secondary cooling system” as well as loss of electrical power would likely set off an accident sequence resulting in “serious damage if not total meltdown” of the core. *Id.* at 51-52.

The *Argonne Study* also determined that a Boeing 707 aircraft — slightly smaller than some of today's commercial aircraft — hitting a nuclear power plant could produce vibrations exceeding those experienced during an earthquake. *See id.* at 70. This finding is significant because of a 1987 study commissioned by the NRC on the effects of earthquake forces on relays — electrical switches — at nuclear power plants. NRC, *Relay Chatter & Operator Response After a Large Earthquake*, NUREG/CR-4910 (1987) [hereinafter *Relay Chatter Study*]. This study demonstrated that the vibrations associated with an earthquake could cause the relays to switch from the opened to closed position, from the closed to the open position, or even to cycle back and forth between positions. The relay repositioning would cause operating equipment to stop and standby equipment to start. The study concluded that if an earthquake were strong enough to cause loss of offsite power and relay chattering, core damage almost certainly would result. *See id.* at 6-5. Thus, because an aircraft crashing into a nuclear plant structure produces vibrations similar to those of an earthquake, the crash would have a high likelihood of causing reactor core damage — even without considering the effect of fires, explosions, or penetration of the aircraft through the containment structure.

Other studies conducted by or for the NRC prior to September 11, 2001 also concluded that an aircraft hitting a nuclear power plant could cause a reactor meltdown, damage spent fuel pools, and lead to the release of radiation. A study of safety at the Indian Point Energy Center in New York, for example, determined that a core meltdown

¹ A fully loaded Boeing 767 weighs nearly 400,000 pounds. *See Boeing, Technical Characteristics—Boeing 767-200ER*, at http://www.boeing.com/commercial/767family/pf/pf_200prod.html. The A-380, Airbus's new superjumbo airliner, has a maximum takeoff weight of 1,235,000 pounds. *See Airbus, Aircraft Families/A380 Specifications*, at <http://www.airbus.com/en/aircraftfamilies/a380/a380/specifications.html>.

could occur if either of the control buildings at the Indian Point nuclear power plant were hit by even a light aircraft. See Power Auth. of the State of N.Y. & Consol. Edison Co., *Indian Point Probabilistic Safety Study*, at 7.6-3 to 7.6-6 (1982). And an NRC study of spent fuel pools at decommissioning nuclear power plants, the final results of which the NRC published in 2001, concluded that aircraft damage could affect the structural integrity of spent fuel pools — which contain highly radioactive uranium and plutonium and are located outside the reactor's protective containment shells — or the availability of nearby support systems. NRC, *Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants*, NUREG-1738, at § 3.5.2 (2001) [hereinafter *2001 NRC Spent Fuel Pool Study*]. The NRC further found that one of two crashes would damage the spent fuel pool enough to uncover the stored fuel, which could lead to serious consequences from a zirconium cladding fire. See *id.*

Despite the risks posed by an aircraft crash, prior to 9/11, the NRC found the risks acceptable because of the low probability that an aircraft would *accidentally* hit a nuclear power plant. See, e.g., *Indian Point Probabilistic Safety Study*, *supra*, at 7.6-6 (concluding that the probability of an accidental crash was sufficiently low as to “present no significant hazard”). The NRC did not consider — or considered it extremely unlikely — that anyone would deliberately crash an airplane into a nuclear power plant.

B. September 11, 2001, and Its Aftermath

On September 11, 2001, terrorists hijacked four jet airliners and crashed three of them into their intended targets. The impact of the fuel-laden planes caused explosions and large, long-lasting fires. Those explosions and fires destroyed a portion of the Pentagon in northern Virginia and caused the collapse of the World Trade Center towers and nearby buildings in New York City. See Nat'l Comm'n on Terrorist Attacks Upon the U.S. (“9/11 Commission”), *The 9/11 Commission Report* (2004).

Minutes before hitting the World Trade Center, two of the hijacked planes flew near or over Indian Point, a nuclear power plant located on the Hudson River twenty-four miles north of New York City. See *id.* at 32 (American Airlines 11, United Airlines 175). The wind direction at the time of the attacks was towards the southeast — that is, from Indian Point towards New York City. See *id.* at 285.

The 9/11 Commission's report revealed that Khalid Sheikh Mohammad, the mastermind of the 9/11 attacks, originally planned to hijack additional aircraft to crash into targets on both coasts, including nuclear power plants. *The 9/11 Commission Report* at 154. As late as July 2001, the terrorists were considering attacking a specific nuclear facility in New York, which one of the pilots “had seen during familiarization flights near New York.” *Id.* at 245. This was most likely Indian Point.

In the years since 9/11, the federal government has repeatedly acknowledged that there is a credible threat of intentional attacks on nuclear power plants, including the specific threat of an aircraft attack. For instance:

- On January 23, 2002, the NRC issued an alert to the nation's nuclear power plants warning of the potential for an attack by terrorists who planned to crash a hijacked airliner into a nuclear facility. Kenneth R. Bazinet & Richard Sisk, *Plant Attacks Feared*, N.Y. Daily News (Feb. 1, 2002), at 5, available at 2002 WL 3165383.
- In his 2002 State of the Union address, President Bush stated that "diagrams of American nuclear power plants" had been found in Afghanistan, suggesting that Al-Qaeda may have been planning attacks on those facilities. *The President's State of the Union Address* (Jan. 29, 2002), available at <http://www.whitehouse.gov/news/releases/2002/01/20020129-11.html>.
- On May 14, 2002, Gordon Johndroe, a spokesman for the Office of Homeland Security, noted that "we know that Al-Qaeda has been gathering information and looking at nuclear facilities and other critical infrastructure as potential targets." Bill Gertz, *Security Boosted at Nuke Facilities*, Wash. Times (May 14, 2002), available at <http://www.ohiocitizen.org/campaigns/electric/pre2003/boosted.htm>.
- On May 24, 2002, the NRC reported that the nation's nuclear power plants had been placed on heightened alert as a result of information gained by the intelligence community. *Wide-Ranging New Terror Alerts*, CBS News.com (May 26, 2002), available at <http://www.cbsnews.com/stories/2002/05/24/attack/main510054.shtml>.
- On November 15, 2002, the FBI sent a bulletin to law enforcement agencies, warning them that Al-Qaeda's "highest priority targets remain within the aviation, petroleum, and nuclear sectors." *Text of FBI Terror Warning*, CBSNews.com (Nov. 15, 2002), available at <http://www.cbsnews.com/stories/2002/11/15/attack/main529501.shtml>.
- On May 1, 2003, the FBI issued a Threat Communication warning the nuclear plant operators to remain vigilant about suspicious activity that could signal a potential terrorist attack. *FBI Warns of Nuke Plant Danger*, CBS News.com (May 1, 2003), available at <http://www.cbsnews.com/stories/2003/09/04/attack/main571556.shtml>.
- On September 4, 2003, the United States General Accounting Office ("GAO") issued a report noting that the nation's commercial nuclear power plants are possible terrorist targets and criticizing the NRC's oversight and regulation of nuclear power plant security. GAO, *Nuclear Regulatory Commission: Oversight of Security at Commercial*

Nuclear Power Plants Needs to Be Strengthened, GAO-03-752 (2003); see also GAO, Testimony Before the Subcomm. on Nat'l Security, Emerging Threats, & Int'l Relations, House Comm. on Gov't Reform, *Nuclear Power Plants Have Upgraded Security, But the NRC Needs to Improve Its Process for Revising the DBT*, GAO-06-555T, at 1 (2006) [hereinafter "2006 GAO Testimony"] (stating that, "[a]ccording to the [NRC] . . . , there continues to be a general credible threat of a terrorist attack on the nation's commercial nuclear power plants, in particular by al Qaeda and like-minded Islamic terrorist groups").

- On July 1, 2004, the FBI issued a bulletin to 18,000 law enforcement agencies nationwide warning that recent intelligence continued to show al-Qaeda's interest in attacking a range of facilities, including nuclear plants. *FBI's 4th Warning*, CBSNews.com (July 2, 2004), available at <http://www.cbsnews.com/stories/2004/07/08/national/printable628204.shtml>.
- The Nuclear Regulatory Commission has ranked Indian Point "in terms of potential human consequences as the No. 1 site in the nation," said Robert Stephan, Homeland Security's assistant secretary for infrastructure protection. Greg Clary, *New Focus on Indian Pt.*, The Journal News March 23, 2006.
- In July 2007, the National Intelligence Estimate determined "We judge the US Homeland will face a persistent and evolving terrorist threat over the next three years." Director of National Intelligence, *The Terrorist Threat to the US Homeland*, July 17, 2007 National Intelligence Estimate (unclassified and publicly-released portion) (available at the White House web site: <http://www.whitehouse.gov/news/releases/2007/07/20070717-2.html>).
- On September 27, 2007, as part of this proceeding, the NRC stated "The Commission believes that it is prudent for nuclear power plant designers to take into account the potential effects of the impact of a large, commercial aircraft." 72 Fed. Reg. 56,288 (October 3, 2007).

The Federal Emergency Management Agency, another federal agency responsible for assessing terrorist threats and for assuring the safety and security of the public, has taken actions signifying that it considers an aircraft attack on a nuclear power plant to be a credible threat. For instance, during a June 2004 exercise to assess emergency preparedness at Indian Point, the agency simulated a suicide attack by a large cargo jet. Fed. Emergency Mgmt. Agency, *Final Exercise Report: Indian Point Energy Center*, at 101-02 (Oct. 25, 2004).

Post-9/11 scientific studies confirm that nuclear plants remain vulnerable to airborne attacks that could have catastrophic results. In 2005, the National Academy of Sciences released a report from a study it conducted at the request of Congress, with the sponsorship of the NRC and the Department of Homeland Security, of the security risks posed by the storage of spent fuel at nuclear plant sites. See Nat'l Acad. of Scis., *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report* (2006) [hereinafter *NAS Study*]. Based upon information provided by the NRC, the National Academy of Sciences judged that "attacks with civilian aircraft remain a credible threat." *Id.* at 30. It noted that terrorists might choose to attack spent fuel pools because they are "less well protected structurally than reactor cores" and "typically contain inventories of medium- and long-lived radionuclides that are several times greater than those contained in individual reactor cores." *Id.* at 36. The National Academy of Sciences concluded that the storage pools are susceptible to fire and radiological release from a wide range of conditions, including intentional attacks with large civilian aircraft. *Id.* at 49, 57. Similarly, the German Reactor Safety Organization, a scientific-technical research group that works primarily for nuclear regulators in Germany, found that large jetliners crashing into nuclear facilities under a variety of scenarios could cause uncontrollable situations and the release of radiation. German Reactor Safety Org., *Protection of German Nuclear Power Plants Against the Background of the Terrorist Attacks in the U.S. on Sept. 11, 2001* (Nov. 27, 2002) [hereinafter *GRS Study*], translation available at <http://www.greenpeace.org/raw/content/international/press/reports/protection-of-german-nuclear-p.2.pdf>.

The terrorist attacks of 9/11 caused nearly 3,000 deaths. *The 9/11 Commission Report* at 311. In comparison, a 2004 study by the Union of Concerned Scientists concluded that a major release of radiation from the Indian Point nuclear power plant could kill as many as 44,000 people within a week and more than 500,000 people over time. See Edwin Lyman, *Chernobyl on the Hudson? The Health & Economic Impacts of a Terrorist Attack at the Indian Point Nuclear Plant* 23 (2004).

C. The NRC's DBT Rulemaking Proceeding

Following the attacks of 9/11, the NRC's regulation of security at nuclear facilities came under public scrutiny. In 2003, without notice or opportunity for public comment, the NRC issued three orders revising the DBTs for nuclear power reactors (the "DBT Orders"). *All Operating Power Reactor Licensees; Order Modifying Licenses (Effective Immediately)*, 68 Fed. Reg. 24,517 (May 7, 2003). While the details of the revised DBTs were not revealed publicly, they did not include air-based threats.

In 2004, the NRC commenced a rulemaking proceeding in response to another administrative petition filed by CBG. See *Petition for Rulemaking; Notice of Receipt*, 69 Fed. Reg. 64,690 (Nov. 8, 2004) (NRC Docket No. PRM 73-12). The petition requested that the NRC amend its DBT regulations to protect against the terrorist capabilities evidenced by the attacks of 9/11, including air attacks. It referenced the 2002 *GRS Study*, which concluded that reactors could not withstand impacts from large commercial aircraft like those that occurred on 9/11. See *CBG Petition* at 25. The petition also discussed findings by the 9/11 Commission and articles in the *Bulletin of Atomic Scientists* regarding the

growing threat of nuclear terrorism, and an analysis prepared by the Union of Concerned Scientists (“UCS”) regarding the vulnerability of spent fuel pools to air attack. *See id.* at 2-18, 25.

The *CBG Petition* asked the NRC to require nuclear power plant licensees to construct passive barriers against air attacks so that the plants would be able to withstand an attack from a fully loaded jet. *See id.* at 24-26. The petition requested that the NRC consider requiring the installation of an external network of steel I-beams, cables, or mesh. *See id.* at 25; *see also* Daniel Hirsh, et al., *NRC’s Dirty Little Secret: The Nuclear Regulatory Commission Is Still Unwilling to Respond to Serious Security Issues*, Bulletin of the Atomic Scientists, at 46-47 (May/June 2003). These structural defenses would shred an aircraft short of its intended target and thereby significantly reduce the penetration power of an attacking aircraft and the associated fire and explosion hazards.² In this manner, the structural defenses would shield the reactors, spent fuel pools, and critical support buildings. CBG estimated that the cost of such a barrier would be minimal compared to the initial construction costs for the power plant. *See CBG Petition* at 26. On March 19, 2007, the NRC issued its final rule amending the DBT regulation. 72 Fed. Reg. 12,705. While the NRC revised the DBT in some respects, it did not include air craft threats within Part 73.1.³

II. SPECIFIC COMMENTS ON THE PROPOSED AIRCRAFT IMPACTS ASSESSMENT RULE

This proposed rule would revise 10 C.F.R. Part 52 to require applicants for new standard design certifications that do not reference a standard design approval; new standard design approvals; combined licenses that do not reference a standard design certification, standard design approval, or manufactured reactor; and new manufacturing licenses that do not reference a standard design certification or standard design approval to assess aircraft impact assessments and describe the design features and other means to avoid or mitigate, to the extent practicable, the effects of an aircraft impact with reduced reliance on operator actions. Proposed Rule, *Consideration of Aircraft Impacts for New Nuclear Power Reactor Designs*, 72 Fed. Reg., 56,287, 56,288 (Oct. 3, 2007). The NRC has specifically exempted the four new reactor designs that it has pre-approved⁴ and the

² An illustration of such an external protection system is contained in an animated clip submitted by CBG to the NRC and is also *available at* <http://www.committeetobridgethegap.org/beamhenge.html>.

³ The State of New York and others have challenged the DBT rule’s exclusion of air-based threats.

⁴ The four NRC pre-approved reactor designs are: the U.S. Advanced Boiling Water Reactor (“ABWR”) design, the System80+ design, the AP600 design, and the AP1000 design. None of these reactor models has yet been constructed in the United States. 72 Fed. Reg. at

nation's 104 existing nuclear reactors from the rule. *Id.* at 56,290.

A. The NRC Must Apply the Proposed Aircraft Impacts Assessment Rule to All Currently Operating Power Reactors to Ensure Adequate Protection of Public Health and Safety

In the proposed rule, the NRC states that it is not applying the aircraft impact assessment requirement to currently operating nuclear power reactors because the NRC has determined that the existing designs of such plants, along with currently-applicable security requirements – including the DBT rules that exclude air-based threats – provide an adequate level of protection to public health and safety against aircraft impacts. *See* 72 Fed. Reg. 56,290. These current requirements direct licensees of existing power reactors to implement certain unspecified readily available “mitigation measures” to address “losses of large areas of a (reactor) plant due to fires and explosions.” *Id.* Neither the recently promulgated DBT regulations nor the proposed rule require nuclear power plant licensees to construct any passive defensive barriers against air-based threats or conduct any analysis of their design or ability to withstand an aircraft crash.

The exemption from the proposed rule is inconsistent with evidence before the NRC regarding the vulnerability of nuclear reactors and spent fuel pools to attacks using explosive devices, including aircraft and vehicle and waterborne bombs. This evidence compelled the NRC to revise the DBT regulation to require licensees to protect against vehicular and waterborne bomb attacks. *See* 72 Fed. Reg. at 12,717. Similarly, requiring licensees of currently operating power reactors to consider, analyze, and protect against all air-based threats, and the large, long-lasting explosions and fires caused by the crash of a large, commercial aircraft, is necessary to ensure adequate protection of the public health and safety. The NRC's exclusion of airborne threats from the DBT rule, as well as its exclusion of currently operating power reactors from the aircraft impacts assessment rule, is arbitrary and capricious.

The NRC's conclusion that mitigation measures will provide adequate protection for currently operating power reactors also ignores evidence from numerous studies, some of which are cited above, demonstrating the vulnerability of nuclear power reactors and spent fuel pools to aircraft attacks and other types of attacks using explosive devices. Instead, the NRC based its determination that these measures were sufficient to ensure adequate protection on “detailed, site-specific engineering studies of a *limited number* of nuclear power plants.” 72 Fed. Reg. at 56,291 [emphasis added]. The NRC has not explained how the results of any of the prior studies cited here or by other commenters can be reconciled with these “limited number” of engineering studies. In the absence of any reasonable explanation, the NRC's decision to treat air-based attacks as a “beyond-design-basis event” and exclude existing nuclear power reactors and spent fuel facilities from the aircraft impacts assessment rule is arbitrary and capricious.

56,290, n.2; 10 C.F.R. Part 52, Appendices A-D.

B. The NRC Must Not Exclude Currently Approved Design Certifications from the Proposed Aircraft Impacts Assessment Rule

The NRC proposes to exclude four currently approved standard design certifications from the aircraft impacts assessment rule based upon its determination that the rule is "an enhancement beyond what is necessary for adequate protection." 72 Fed. Reg. at 56,290. None of these reactors has yet been constructed in the United States, and therefore, the NRC could require prospective changes to these designs before any concrete is mixed for these construction projects. Requiring licensees of currently operating power reactors and any future plants to assess the impacts of and to protect against all air-based threats, including the impact of a large, commercial aircraft, is necessary to ensure adequate protection of the public health and safety. Thus, the NRC's exclusion of the four certified but unbuilt standard designs from the proposed rule is inconsistent with the NRC's statutory mandate.

Pursuant to 10 C.F.R. § 52.63(a)(1), the NRC is authorized to impose new requirements on a currently approved standard design certification to assure adequate protection of the public health and safety or the common defense and security. The NRC must impose the new aircraft impacts assessment requirements on these already-certified standard designs to ensure adequate protection of the public health and safety.

The NRC should not exclude the four currently approved standard design certifications from the proposed rule, even if the NRC persists in concluding that it is not necessary to ensure adequate protection to require these certified designs to conduct an aircraft impacts assessment. The NRC explicitly acknowledges that inclusion of design features, functional capabilities, or strategies in a plant design to avoid or mitigate the effects of an aircraft impact based on an aircraft impact assessment would enhance the overall safety and security of a reactor. 72 Fed. Reg. at 56,290. It would be imprudent for the NRC to allow a new reactor to be built with less than the most current, up-to-date safety and security information and technology, including design features that can avoid or mitigate the effects of an aircraft attack, including those discussed in NUREG/CR-1345, "Nuclear Power Plant Design Concepts for Sabotage Protection," Vols. 1 & 2 (January 1981), which the NRC appears to have ignored when certifying the four exempted designs.

At the very least the NRC should impose the new rule upon renewal of any design certification pursuant to 10 C.F.R. § 52.59. Under 10 C.F.R. § 52.59, the NRC may impose additional requirements upon renewal of a design certification based on a determination that there is a substantial increase in overall protection of the public health and safety to be derived from the new requirements and indirect costs of implementation of those requirements are justified in view of this increased protection. The NRC has already determined in the proposed rule that an aircraft impacts assessment would provide an enhanced level of protection beyond that provided by existing requirements. 72 Fed. Reg. at 56,290.

C. The NRC Should Expand the Scope of the Required Aircraft Impacts Assessment to Require Consideration of Methods to Prevent an Aircraft from Impacting the Plant

As currently drafted, the proposed rule would require applicants for new standard design certifications to describe and evaluate design features, functional capabilities, and strategies to avoid or mitigate the effects of an aircraft impact. However, the rule does not appear to require applicants to have designers evaluate features, capabilities, and strategies to prevent an aircraft from striking a nuclear reactor or spent fuel pool in the first instance, such as by installing passive physical barriers. Licensees of existing power plants, as well as applicants for the construction of new plants, should be required to evaluate methods to avoid an aircraft impact, such as the installation of an external network or steel I-beams, cables, or mesh. These structural defenses would shield the reactors, spent fuel pools, and critical support buildings and would significantly reduce the penetration power of an attacking aircraft and the associated fire and explosion hazards. The cost of such barriers would be minimal compared to the overall construction costs for a nuclear power plant.

D. The NRC Should Include Smaller Jet Aircraft and General Aviation Aircraft Within the Scope of the Proposed Rule

The *GE Study* and the *Indian Point Probabilistic Study* recognize that small aircraft can cause significant damage to a nuclear power station. Since the time that those studies were prepared smaller jets and general aviation aircraft have become increasingly powerful and can travel at higher speeds. It would be arbitrary and capricious to knowingly exclude such potential threats from the scope of the proposed rule.

E. The National Environmental Policy Act Requires the NRC to Prepare an Environmental Impact Statement for the Proposed Aircraft Impacts Assessment Rule

The National Environmental Policy Act, 42 U.S.C. § 4321 *et seq.*, requires the NRC to prepare an environmental impact statement ("EIS") studying the effects of its rulemaking, including how its rulemaking affects the risk of terrorism. The proposed rule is a "major federal action" that may have a significant effect on the environment because it bears directly on the degree to which public health and the environment will be protected against the impacts of aircraft attacks. The NRC's decision as to whether to require licensees of currently operating plants and newly constructed plants to protect against air-based threats impacts the chances of a successful terrorist attack that causes radiological contamination. Thus, the NRC is required to prepare an EIS examining the environmental impacts of its rulemaking, including its exclusion of currently operating power reactors and currently approved standard design certifications, and considering alternatives to the proposed rule that would reduce those impacts.

Last year, a unanimous Ninth Circuit panel ruled that the NRC must examine the environmental impacts resulting from the storage of spent fuel in large metal cylinders

known as “dry casks.”⁵ *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016 (9th Cir. June 2, 2006). That case involved an application by Pacific Gas & Electric Co. for a NRC license to construct and operate an interim dry cask spent fuel storage installation at the Diablo Canyon nuclear power plant located in San Luis Obispo, California. When the NRC issued the license, a non-governmental organization filed a petition under the Atomic Energy Act and the NEPA that sought to compel the NRC to examine the environmental impacts caused by the continued storage of spent nuclear fuel in the proposed dry cask storage facility. The circuit ruled that the NRC’s decision to categorically exclude the potential impacts caused by an attack on the dry cask storage facility from any NEPA analysis was irrational given the NRC’s recognition (elsewhere) of the possibility of such intentional actions. 449 F.3d at 1030-31. Earlier this year, the United States Supreme Court denied PG&E’s petition for certiorari. 127 S.Ct. 1124 (Jan. 16, 2007).

Following the *San Luis Obispo* ruling (and the denial of certiorari), the NRC announced in the Oyster Creek (NJ) relicensing proceeding that it will follow that ruling only within the Ninth Circuit and would not apply it elsewhere in the nation. The risks of terrorism are neither speculative nor theoretical. The NRC has an affirmative duty under NEPA and the Council on Environmental Quality regulations interpreting and implementing NEPA to carry out NEPA’s mandate for full public disclosure of reasonably foreseeable environmental effects that may result from federal actions or approvals. The NRC should reconsider its ill-advised refusal to carry out NEPA’s mandate and instead consider and analyze all the reasonably foreseeable significant risks that will affect the environment. The NRC should implement the Ninth Circuit U.S. Court of Appeals’ decision in *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016. There is no reason why states and citizens outside the Ninth Circuit should receive less protection under the nation’s laws.

III. CONCLUSION

Before 9/11, there were warning signs of an impending terrorist strike within the United States. At that time, however, key decision makers never imagined that terrorists would use aircraft in such a destructive manner. Since then, responsible government officials from the President on down have recognized that terrorists continue to seek to cause widespread death and destruction. The same officials have expressly and repeatedly warned that terrorists are targeting nuclear facilities. In those circumstances, the NRC’s decision to exclude the 104 existing nuclear reactors and the 4 pre-approved reactor models from the proposed rule is arbitrary. It is folly to impose requirements necessary to fend off potential terrorist attacks only on new plants that won’t be built for another 10-20 years, but to leave vulnerable to attack the existing fleet of 104 reactors.

⁵ Given the delays with the proposed Yucca Mountain facility, the NRC has approved the interim storage of radioactive spent fuel in such casks after the fuel has sufficiently cooled in storage pools. Like the cooling pools, dry cask storage facilities are located outside the containment shells that surround nuclear reactors.

From: "Morgan Costello" <Morgan.Costello@oag.state.ny.us>
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Subject: RIN 3150-A119 New York State's Comments Regarding Proposed Rulemaking to Amend 10 CFR Part 52

Please see attached cover letter and comments.

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