

Nuclear Information and Resource Service
1424 16th Street NW Suite 404
Washington, DC 20036
Tel. 202 328 0002 <http://www.nirs.org>

January 24, 2005

Annette L. Vietti-Cook
Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555
Submitted by email: SECY@nrc.gov and FAX 301 415 1101

**Comments In Support of Committee to Bridge the Gap's Proposed Rulemaking to
Enhance the Design Basis Threat for Nuclear Power Stations (PRM-73-12)**

Dear Secretary Vietti-Cook:

On behalf of Nuclear Information and Resource Service (NIRS) I am writing in support of Committee to Bridge the Gap's Petition for Rulemaking 73-12 (PRM-73-12), which would further upgrade the Design Basis Threat (DBT) to address what our constituency perceives as inadequate protection against terrorism potentially directed at U.S. commercial nuclear power stations.

The requested revision of the DBT by PRM-73-12 would not be unprecedented. Since it was first issued in 1977, the DBT for commercial nuclear power reactors has been revised twice, each time to reflect the increased threat from terrorism. The first revision came following the first bombing of the World Trade Center and the vehicle intrusion of the Three Mile Island nuclear power station in 1993. Following the September 11, 2001 terrorist attacks, the United States Nuclear Regulatory Commission (NRC) advised that nuclear power station operators go to their highest level of security for what they had up to date contemplated and prepared for. NRC again issued a revised DBT in April 2003 requiring nuclear power station operators to develop and implement by October 2004 new security plans setting out how their nuclear sites will be protected against the threat defined in a new "upgraded" DBT. The new DBT reflected a marginal increase in the size of a potential terrorist force, its weapons and modes of deployment. NRC issued a series of advisories and orders to licensed operators to make certain security enhancements---such as installing additional physical barriers (i.e. Jersey barriers, guard towers), increasing on-site patrols, and enacting further restrictions to site access---with the intent that these measures could be completed quickly until a more comprehensive analysis of the terrorist could be completed. NRC additionally improved its force-on-force exercises or Operational Safeguard Response Evaluations (OSRE) by planning to conduct the mock assault exercises every 3 years rather than as previously conducted every 8 years. NRC currently claims that these force-on-force evaluations are more realistic than previously conducted and therefore adequate. NRC currently claims that

this new DBT is the largest “reasonable threat” against which a regulated private guard force need be expected to defend against.

Acknowledging these agency efforts, NIRS is increasingly concerned that NRC’s new and “upgraded” DBT does not yet measure up to the equivalent of a clear and present danger already demonstrated on September 11, 2001 in the successful attacks on the World Trade Center and the Pentagon. On that day, the United States homeland was attacked by four coordinated teams totaling nineteen well-trained and suicidal adversaries. It is our concern that the current “upgraded” DBT does not require nuclear power station operators to contemplate, prepare or evaluate its security preparations and response capability to this level of attack. For example, the “upgraded” DBT still does not require preparations to defend against or respond to aircraft attacks nor emplace effective defensive barrier systems to prevent sabotage of vulnerable reactor cooling water intake systems (intake and discharge pipes, dams, etc.) from attack by a water borne force.

Because of the very large and growing inventories of irradiated fuel and other dangerous nuclear fission products located onsite in the reactor core, in a variety of irradiated fuel storage pond designs and densely packed configurations and onsite Independent Spent Fuel Storage Installations (ISFSI), commercial nuclear power facilities are now acknowledged as potential pre-deployed weapons of mass destruction. If just one of the nation’s nuclear power stations was successfully attacked by malevolent forces whether it be by foreign or domestic paramilitary operations, insurgent movements, terrorists, or an otherwise deranged or disturbed individual, it would result in unacceptable consequences.

It is therefore increasingly unacceptable to the American public and for that matter our international neighbors (Canada and Mexico) who constitute at-risk populations for NRC and the U.S. government to further ignore both the existing threat to structural and programmatic vulnerabilities in nuclear power station security systems.

For example, the densely populated Chicago, Illinois area is surrounded by 6 nuclear power stations (Dresden 2 & 3, LaSalle 1 & 2 and Quad Cities 1 & 2 where thousands of tons of irradiated used nuclear fuel, or high-level radioactive waste, are literally stored in poorly protected roof top storage ponds vulnerable to penetration by aircraft or other means available to terrorists. NRC’s own publicly available report identifies that a successful drain down of the protective cooling water in any one of these nuclear waste storage ponds would result in a zircoloy fuel fire inflicting tens of thousands of cancer deaths out to 500 miles.¹

The U.S. nuclear power industry has long been identified as unwilling to expend sufficient capital on security resulting in deficiencies in its terrorist response capabilities. These deficiencies are amply documented in the Differing Professional Opinion (DPO) of Captain David Orrick, Ret. (USN), Security Specialist, Nuclear Reactor Regulation, U.S. NRC, who directed the agency’s Operational Safeguards Response Evaluations (OSRE).

¹ “Technical Study of Spent Fuel Pool Accident Risks at Decommissioned Nuclear Power Plants,” U.S. Nuclear Regulatory Commission, January 18, 2001.

He states that from 1991 to 1999 government contractors conducting force-on-force evaluations with 6 months advance notice provided to tested nuclear utilities along with pre-evaluation table-top exercises identifying the exact set of specific scenarios to be conducted the next day still resulted in 47% of the nuclear power stations identified with “significant weaknesses” where the mock attack force reached onsite target sets resulting in simulated core damage. As Captain Orrick framed it, “‘Significant’ here means that a real attack would have put the reactor in jeopardy with the potential for core damage and a radiological release, i.e. and American Chernobyl.”²

Even these force-on-force evaluations were unrealistically limited to a very small attacking force, on foot, utilizing one passive insider (providing only information). The DBT for these mock attacks was limited to ground based assault and excluding assaults from the water or air. Weapons systems available to the mock terrorists for exercises were unrealistically limited. Security around irradiated fuel storage ponds and nuclear waste storage casks was not evaluated. Vehicles used either in support or as truck bombs were limited in size to Sport Utility Vehicles, despite evidence that larger vehicles could be successfully wielded against nuclear power stations as exemplified in the devastating April 19, 1995 domestic bombing of the Murrah Federal Building in Oklahoma City, Oklahoma.³

In the post-September 11th world, enhanced security for potential targets of terrorist attack in the U.S. is essential and to ignore the consequences by failing to contemplate and evaluate facilities for such an attack by substantially raising the security bar is unacceptable. Few facilities in this country can match the potential harm arising from such an attack on nuclear reactors, their irradiated fuel storage ponds located outside primary containment and onsite or any subsequent away-from-reactor Independent Spent Fuel Storage Installations where high level radioactive waste canisters are tightly congregated on above ground tarmacs.

Terrorist attacks using hijacked, stolen, rented or privately owned aircraft are of increasing concern to national security if these aircraft are directed against nuclear power stations. While NRC will claim that the responsibility for prevention of aircraft diversion as a weapon against a nuclear site is outside its jurisdiction, more appropriately taken up by other federal agencies and that strides have been made to increase commercial airline security, significant challenges remain for airport perimeter security and access controls as well as security concerns related to air cargo and general aviation.⁴ Commercial, general aviation and privately owned aircraft remain vulnerable to being diverted for use

² <http://www.nirs.org/reactorwatch/security/osrenrdocument.pdf> , “Differing Professional Opinion Regarding NRC’s Reduction in Effectiveness and Efficiency in the ‘Staff Recommendations’ of the Follow-on OSRE Program for Nuclear Power Plants,” Captain David Orrick, Ret. (USN), Security Specialist, Nuclear Reactor Regulation, US NRC, February 03, 1999, p. 3.

³ <http://edition.cnn.com/US/OKC/bombing.html>

⁴ “Aviation Security: Improvements Still Needed in Federal Aviation Security Efforts,” (GAO-04-0592T), Government Accountability Office, March 30, 2004 and “Aviation Security: Further Steps Needed to Strengthen the Security of Commercial Airport Perimeter and Access Controls,” (GAO-04-728), Government Accountability Office, June 04, 2004.

as delivery systems for large inventories of combustible aviation fuel and/or explosives (i.e. C4 high velocity plastic explosive).

NIRS argues that reactor infrastructure, security preparedness and force-on-force response capability evaluations squarely fall within the NRC's responsibility in this regard.

Reactor building structures have long been identified as structurally vulnerable and inadequately analyzed for aircraft penetration. NRC and the nuclear industry have historically compensated for this vulnerability in licensing proceeding by characterizing the risks associated with accidental aircraft collision as remote and reasonably within acceptably low probability.

The fact that aircraft have now been used, not once but in four coordinated events, to deliberately inflict mass casualties in the United States requires that these previously acknowledged vulnerabilities be mitigated rather than factored away.

For example, a now suppressed Argonne National Laboratory report to the NRC released in 1982 identifies that the agency has not adequately evaluated the effect of aircraft penetration of the reactor containment. The report states, "'Based on the review of past [NRC] licensing experience, it appears that fire and explosion hazards have been treated with much less care than the direct aircraft impact and the resulting structural response. Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated."⁵

NRC has repeatedly claimed that the containments systems for nuclear power stations are uniformly robust and that the agency maintains confidence that aircraft will not penetration any containment or significantly damage reactor safety systems including the control room or onsite irradiated fuel storage structures. NRC has consistently characterized all reactor containment structures as the same monolithic and indestructible structure.

In fact, NRC's generic treatment of reactor containment systems seriously misinforms the general public. As stated earlier in these comments, NRC has acknowledged and documented the structural vulnerability of the elevated nuclear waste storage ponds located on the top of 32 General Electric Mark I & II Boiling Water Reactor (GE BWR) buildings containing more than 16,000 metric tons of irradiated fuel. NRC's own assessments of this structural vulnerability state, "Mark-I and Mark-II secondary containments generally do not appear to have any significant structures that might reduce the likelihood of aircraft penetration, although a crash into 1 of 4 sides of a BWR secondary containment may be less likely to penetrate because other structures are in the way of the aircraft."⁶

⁵ "Nuclear Plants' Vulnerability Raised Attack Concern 1982 Report on Danger of Jet Crashes Into Reactors Was Open to Public, Despite Terrorism Fears," Washington Post, October 25, 2001, p. A04.

⁶ "Technical Study of Spent Fuel Pool Accident Risks at Decommissioned Nuclear Power Plants," U.S. Nuclear Regulatory Commission, January 18, 2001, Section 3.5.2, Aircraft Crashes, p.3-23.

Consequently, contrary to NRC's depiction of a uniformity in the robustness of reactor containment and building designs, in fact there is a significant variation in the degree of risk associated with aircraft penetration and core damage frequencies such as in the case of the GE BWR Mark I, II, & III or the Westinghouse Ice Condenser Pressurized Water Reactor, where in all cases, the smaller, lighter-weight containments were designed and constructed with economic considerations rather than security concepts originally in mind.

PRM-73-12 cites numerous examples of al Qaeda's documented strategy to target U.S. nuclear power stations for producing casualties en masse and severe economic dislocation. It is reasonable to believe that al Qaeda is not the only terrorist or insurgent organization that has or will consider nuclear power stations as pre-deployed weapons of mass destruction and targets of opportunity.

Terrorist and radical insurgent movements continue to be documented as planning to exploit vulnerabilities in nuclear power security.

On November 23, 2004, the New York Times published an article "CIA Says Iran, Qaeda Pursued Nuclear Weapons" which states: "In addition, we are alert to the very real possibility that al Qaeda or other terrorist groups might also try to launch conventional attacks against the chemical or nuclear industrial infrastructure of the United States to cause panic and economic disruption," the CIA report said.⁷ The article underscores the nature of our nuclear security emergency and the urgency for thorough security mitigation measures and appropriate enforcement action for upgrading nuclear security. We remain concerned that NRC does not yet require industry to affect comprehensive and meaningful security measures under a still inadequate DBT including structural changes nor has the agency taken appropriate enforcement action in response to identified security and structural vulnerabilities conveyed through generic communications and Orders.

Additionally, NIRS points to "Bin Laden Expert Steps Forward," CBS News "60 Minutes," Nov. 14, 2004. Specifically, the CBS News interview with Michael Scheuer, former CIA specialist on Osama Bin Laden, publicly identified an intercepted May 2003 "fatwa" or Islamic decree from Saudi sheik Hamid bin Fahd to Osama bin Laden justifying the use of "nuclear weapons of some dimension" against Americans, including a nuclear weapon, a dirty bomb, or some kind of radiological device.⁸ The tremendous and horrible inventories of radiation contained within irradiated fuel storage ponds located near major U.S. population centers such as Washington, DC, New York City, Chicago, Detroit, Philadelphia and Boston must be contemplated as potential targets given the identified fatwa that require prompt and comprehensive regulatory enforcement action.

⁷ "CIA Says Iran, Qaeda Pursued Nuclear Weapons," New York Times, November 23, 2004.

⁸ "Bin Laden Expert Steps Forward," CBS News "60 Minutes," Nov. 14, 2004, "<http://www.cbsnews.com/stories/2004/11/12/60minutes/main655407.shtml>

Enactment and enforcement of PRM-73-12 mitigates the identified structural vulnerabilities. It would require construction, on a time-urgent basis, of "Beamhenge" shields, consisting of steel I-beams and cabling at stand-off distances from sensitive reactor structures and effectively place a shield in front of the reactor, spent fuel pool, or critical support buildings from an incoming aircraft. This would reasonably and significantly reduce the core damage frequency from aircraft attack intent on using a reactor as a pre-deployed weapon of mass destruction. Such structurally enhanced defenses around all nuclear power stations could either prevent or significantly reduce the penetration power of an attacking aircraft and the associated fire and explosion hazards identified in the aforementioned Argonne report as well as the Mark I & II structural vulnerability of the elevated irradiated fuel storage ponds identified in NRC's own study.

An increasingly safety and security conscious public expects NRC to prioritize and require the optimization of the commercial nuclear power security infrastructure in the course of the agency upholding its mandate for the protection the public's health and safety. While the agency makes the claim that it has upgraded security and enhanced the DBT at nuclear power stations, it remains our concern, today, more than three years after the events of September 11, 2001, that the agency has not required nor enforced structural enhancements specifically designed to reduce core damage frequency or the vulnerability of the irradiated fuel pools or congregated dry storage casks in the event of an aircraft attack.

As stated, PRM-73-12 would also require NRC to upgrade the DBT to contemplate, prepare for and evaluate on-site response capability sufficient to overwhelm the number of attackers evidenced on September 11th plus establish an additional margin of safety. NIRS remains concerned that the current "upgraded" DBT regulations continue to evaluate force-on-force response capabilities against only small group of ground attackers that is not equivalent to the sophistication, capability and physical numbers of attackers that were coordinated in four teams as successfully directed against homeland targets on September 11, 2001.

It is unreasonable and indefensible for NRC to set its regulatory bar for security preparedness and evaluations at nuclear power stations below the level of adversary coordination and ferocity already demonstrated on September 11th.

In conjunction with this petition and in view of the identified clear and present danger, NIRS is concerned with the agency's apparent lack of regard towards more timely inspections of a so-called "upgraded" DBT and in context of the necessary upgrades yet to be made. The agency needs to have a more vigorous enforcement policy towards industry security upgrades. The implementation of an upgraded DBT to include the "Beamhenge" design and requirements for force-on-force evaluations that contemplate an equivalent to the September 11th attacks must be accompanied by a timely implementation program under more rigorous enforcement to uphold the "time urgent" basis of this petition.

The Government Accountability Office (GAO) in testimony before Congress in September 2004 documents concerns for more “time urgent” implementation and a significantly more rigorous enforcement policy. GAO concluded that NRC’s review of licensees’ new security plans under the “upgraded” DBT was rushed and “largely a paper review.”⁹ GAO further concluded “NRC is largely relying on force-on-force exercises it conducts to test plans, but these exercises will not be conducted at all facilities for 3 years... Moreover, if NRC needs to revise its DBT further as the terrorist threat is better defined, it will need longer to make and test all the necessary enhancements.”¹⁰ GAO also cited that NRC reviewers were not visiting nuclear sites to obtain details about security plans and view how those plans purported to interface with the site’s physical layout. NRC did not request to review licensee documents upon which compliance with the revised DBT was based on. GAO further found that NRC “is not following up to verify all violations it found in previous inspections have been corrected and is not taking steps to make ‘lessons-learned’ from inspections available to other regional offices and nuclear power plants, as we (GAO) had recommended.”¹¹

NIRS strongly supports the Petition for Rulemaking and requests NRC take prompt regulatory and rigorous enforcement action for the time urgent implementation of the above stated actions as appropriate security measures for commercial nuclear power stations in light of the clear and present danger to the public health and safety.

Sincerely,

Paul Gunter, Director
Reactor Watchdog Project

⁹ “Preliminary Observations on Efforts to Improve Security at Nuclear Power Plants,” (GAO-04-1064T), Government Accountability Office, Statement of Jim Wells, Director, National Resources and Environment, Testimony Before the Subcommittee on National Security, Emerging Threats, and International Relations, Committee on Government Reform, House of Representatives, U.S. Congress, September 14, 2004, p.4.

¹⁰ Ibid, “What GAO Found”

¹¹ Ibid., p.5