Before the
UNITED STATES NUCLEAR REGULATORY COMMISSION
Rockville, Maryland 20555

In the Matter of	)	
	)	
PROPOSED AMENDMENTS TO 10 C.F.R. PART 73	)	
(Upgrading the Design Basis Threat	)	**DOCKET NO. PRM-73-12**
Regulations for Protection Against	)	
Terrorist Attacks on Nuclear Reactors)	)	
	)	

PETITION FOR RULEMAKING

Pursuant to 5 U.S.C. § 553(e) and 10 C.F.R. § 2.801, the Committee to Bridge the Gap ("CBG") petitions the U.S. Nuclear Regulatory Commission (the "Commission") to amend its regulations at 10 C.F.R. Part 73 to *upgrade the "design basis threat"* (the "DBT," or the magnitude of threat that the facility's security systems must be capable of defeating) and associated requirements for protection of domestic reactors from nuclear terrorism *to a level that encompasses, with a sufficient margin of safety, the terrorist capabilities evidenced by the attacks of September 11, 2001.* Specifically, Petitioners seek: (1) a revision of the threat basis to include (a) attack from the air by airplanes and jets, and (b) attacking forces--be they by land, water, or air— at least equal to the nineteen terrorists involved in the 9/11 attacks in numbers, capacity, ruthlessness, dedication, skills, planning, and willingness to die and create large numbers of casualties. Additionally, Petitioners propose that the security requirements in Part 73 be upgraded to provide high confidence in the ability of the security system to protect against the proposed upgraded 9/11-equivalent DBT. In particular, Petitioners propose requiring, under a time-urgent schedule, construction at reactor sites of shields consisting of I-beams and cabling

("Beamhenge") at stand-off distances from buildings and other assets important to safety at reactor sites so that airplanes or jets attempting to attack sensitive structures would instead crash into the surrounding Beamhenge shield, leaving intact the reactor, spent fuel pool, and support facilities, thus protecting the public from damage that could result in substantial radioactivity releases.

I. Urgency

The context in which this Rulemaking Proposal is made must be kept in mind: A terrorist attack that overwhelmed plant defenses could not only wreck a multi-billion dollar facility but also cause the release of radioactivity comparable to that in a severe nuclear accident, causing tens of thousands of prompt fatalities, tens if not hundreds of thousands of latent cancers and genetic effects, and hundreds of billions of dollars in property damage as a result of large areas of real estate which would be rendered uninhabitable and unusable for literally hundreds of years.

In the post-9/11 threat environment, these risks must be taken very seriously. The National Commission on Terrorist Attacks Upon the United States (the "9/11 Commission") recently revealed, for example, that the original 9/11 plot involved ten planes, some of which were to crash into nuclear power plants:

> As originally envisioned, the 9/11 plot involved even more extensive attacks than those carried out on September 11. KSM [Khalid Sheikh Mohammed, the alleged plot mastermind] maintains that his initial proposal involved hijacking ten planes to attack targets on both the East and West coasts of the United States. He claims that, in addition to the targets actually hit on 9/11, these hijacked planes were to be crashed into CIA and FBI headquarters, *unidentified nuclear power plants*, and the tallest buildings in California and Washington State.
>
> 9/11 Commission Staff Statement No. 16, "Outline of the 9/11 Plot"[1]

[1] See also The 9/11 Commission Report issued July 22, 2004 at p. 154.

The final report of the 9/11 Commission also discloses that as late as July 2001, the plotters were once again considering attacking a nuclear facility, in this case a specific one in New York: "During the Spain meeting, Atta also mentioned that he had considered targeting a nuclear facility he had seen during familiarization flights near New York—a target they referred to as 'electrical engineering.'"[2]

Furthermore, the terrorist risk appears to be increasing. The U.S. State Department's annual "Patterns of Global Terrorism" review, as issued in revised form on June 22, 2004, found a higher number of "significant" terrorist incidents last year than at any time since the U.S. government began issuing data twenty-two years ago. As the *Washington Post* reported the next day, "The revised figures show that more people were killed by terrorists last year than at any time since 1998, apart from 2001, when the Sept. 11 hijackings caused 2,973 deaths. Terrorist bombings and shootings left 3,646 people injured around the world -- more than in any year in the past six."

Additionally, the Justice Department and the Department of Homeland Security have repeatedly warned that al Qaeda is intent on new attacks on the American homeland and interested in attacks on nuclear plants. Attacking reactors would provide a spectacular quasi-

---

[2] Report of the 9/11 Commission, p. 245. The Report indicates that the idea was opposed by others involved in the plot because "unlike the approved targets [e.g., World Trade Center, Pentagon] they had not discussed it with senior al Qaeda leaders and therefore did not have the requisite blessing." The Report also indicates that the other pilots presumed that the airspace around the nuclear facility was restricted, making reconnaissance flights impossible and "increasing the likelihood that any plane would be shot down before impact." Although not entirely clear from the Report, it appears the plotters labored under the misimpression that there are no-fly zones around nuclear plants and that the U.S. has the capability of shooting down planes entering such zones, assuming such high-value targets would have such high-level protections. By now, in the wake of the wide publicity since 9/11 that such no-fly zones don't exist and that the U.S. has declined to put in place the capability of shooting down planes near nuclear plants, one must presume that al Qaeda knows this as well.

nuclear capability to such adversaries, and the importance of adequately protecting such facilities from such attack is absolutely critical. As recently as July 1, 2004, the FBI issued a bulletin to 18,000 law enforcement agencies nationwide warning that recent intelligence continues to show al Qaeda interest in attacking a range of facilities, including nuclear plants. Earlier that same week, Attorney General Ashcroft repeated his contention that al Qaeda was intent on striking again in the U.S. and was 75-90% ready to attack again.[3]

Yet, despite the facts that the original 9/11 plot considered attacking U.S. nuclear plants, that the terrorist risk has increased since 9/11, and that U.S. authorities warn that al Qaeda is planning even more spectacular and deadly attacks in the U.S., nearly three years after the 9/11 attacks, U.S. nuclear reactor facilities remain unprotected against air attacks or against ground attacks involving the 9/11 number of attackers. Something must be done promptly to protect these facilities – and the American public. Increased threats, however, can be countered by measures that can be implemented for modest cost but which will provide substantial protection against events with such potentially catastrophic consequences. The requested action is therefore necessary under the Atomic Energy Act of 1954, as amended, 42 U.S.C. § 2011, et. seq. (the "Act"), to assure the common defense and security and protect the health and safety of the public by deterring attacks on nuclear reactors and reducing their consequences.

Petitioners urge the Commission to adopt the requested measures on an expedited, emergency, urgency basis. Time is absolutely of the essence and the Commission needs

---

[3] "FBI's 4th Warning," CBS/AP, cbsnews.com, July 2, 2004. Note should also be taken that the intelligence community believes that once identified as targets, it is a pattern and *modus operandi* of al Qaeda to continue attempts against the same targets or kinds of target until the attacks are successful.

to be mindful of how great the need for immediate action truly is. Petitioners respectfully request that the Commission keep ever-present in its mind the extraordinary potential consequences of a successful terrorist attack on a U.S. nuclear plant as it evaluates the action requested by this Application.[4]

The catastrophic and tragic events of September 11, 2001, establish beyond any question: a) the intensity of motivation by terrorists to mount dramatic attacks to kill as many Americans as possible; b) the level of planning, organization, training and effectiveness sufficient to highjack four large airliners with the intent to crash them into targets they had selected; c) the single-mindedness of commitment by "martyrs" who are willing to die in pursuit of their objectives to kill as many Americans as possible, even if it means the end of their own lives; and d) the high level of capability, sophistication, and numbers of the terrorists. There can be no doubt that the action requested by this Application is of the highest urgency.

If the risks, motivation, opportunity and capability are beyond dispute, we believe the burden must fall on the Commission to show, beyond a reasonable doubt and to a moral certainty, that the protections the Commission currently has in place are sufficient to counter a 9/11-magnitude terrorist threat. The fact remains that America's nuclear facilities are vulnerable to an attack of 9/11 magnitude and, given the extraordinary potential consequences of a successful terrorist attack on a domestic reactor facility, the Commission needs to take immediate and sufficient action to effectively resolve the ongoing vulnerability.[5]

---

[4] In addition to the potential consequences, the Commission is asked to take note that some nuclear facilities could be protected by the Beamhenge approach in as little as ninety (90) days under some estimates.

[5] The NRC has previously taken the position that no action to protect nuclear plants against air attack is needed, that instead it will rely upon the efforts to screen passengers on commercial airlines. This is obviously insufficient given the potential consequences of a successful air attack on a reactor.

In assessing the mistakes that led to the inability to prevent the terrible events of September 11, 2001, the 9/11 Commission stated in its final report: "Across the government, there were failures of imagination, policy, capabilities and management .... The most important failure was one of imagination. We do not believe leaders understood the gravity of the threat."[6] There must not be a repeat failure of this sort, one that could result in destruction of a domestic nuclear plant and the release of vast quantities of radioactivity.

"Every expert with whom we spoke told us an attack of even greater magnitude is now possible and even probable," Thomas H. Kean, Chair of the 9/11 Commission, said at the press conference on July 22, 2004, in releasing the Commission's final report. "We do not have the luxury of time."[7]

II. The Interests of Petitioner and History of Issue

The Committee to Bridge the Gap has been active for a quarter of a century attempting to increase protections at nuclear facilities against the risk of nuclear terrorism. We here summarize briefly both the history of attempts to improve reactor security and CBG's involvement therein.

The current DBT regulation for nuclear power plants was promulgated in the 1974-6 period, with only one substantive modification in the ensuing thirty years (the truck bomb rule

---

[6] *9/11 Commission Report*, Executive Summary, p. 9

[7] quoted in "9/11 Report Assails Failures," *Los Angeles Times,* July 23, 2004

discussed below).[8] The DBT as established in 10 CFR §73.1(a)(1) in the mid-seventies sets forth that nuclear plant security need not be designed to protect against:

(a) more than one insider,

(b) more than "several" external attackers,

(c) attackers capable of operating as more than one team, i.e., capable of employing "effective team maneuvering tactics,"

(d) a group or individual utilizing weapons of greater sophistication than hand-held automatic weapons.

This original DBT also essentially required the attacks to be on foot, by not requiring protection from truck bombs, or attacks by boat or air.

A few years after the adoption of the DBT regulation, the Governor of California, acting as a representative of an interested state, contended in the Diablo Canyon Nuclear Power Plant operating license proceeding that a likely attacking group could include up to twelve individuals and the plant should be protected against such an attack. The NRC Staff and PG&E asserted that the DBT rules precluded requiring protection against more than *three* external attackers and *one* insider. The Appeal Board agreed, citing in detail the record of the Commission's adoption of the DBT rule.[9]

---

[8] Consideration of the original DBT rulemaking occurred in the mid-70s, with final adoption in early 1977.

[9] The original Appeal Board decision was published with some expurgations, but the Commission, in response to Freedom of Information Act requests, released the documents cited therein that made clear that the DBT was three external attackers. For a more detailed discussion of this matter, see "Nuclear Terrorism: A Growing Threat," A Report to the ACRS by Daniel Hirsch, Stephanie Murphy, and Bennett Ramberg, May 7, 1985.

In the face of rising terrorist risks, CBG has worked for decades for significant upgrade of this longstanding "three-and-one" DBT (three external attackers possibly assisted by a single insider), in addition to other security improvements, including measures for non-power reactors.

For example, from 1979-1984, CBG was a party in the NRC relicensing proceeding regarding the UCLA research reactor, in which CBG alleged inadequate protections against radiological sabotage of the reactor and theft of its weapons-grade uranium. The 1984 Olympics were scheduled to be held at UCLA, concern about terrorism was high, and press reports identified the UCLA reactor—located a few hundred yards from where many of the Olympic events were to be held—as a likely target. However, it was the position of the reactor operator and the NRC staff that no protections against either sabotage or theft were required by NRC regulations, a stance that created significant concern among the public and elected officials. The Licensing Board agreed with CBG and ruled that such protections were indeed required. See 17 NRC 927, 18 NRC 802, and 19 NRC 1330.[10] The UCLA reactor was eventually permanently shut down prior to the Olympics, and the weapons-grade uranium subsequently removed from the site.

The revelations in the UCLA reactor case of inadequate security to protect highly enriched uranium (HEU) from theft or diversion for nuclear weapons purposes contributed to the Commission's decision to adopt new regulations to require conversion of research reactors from use of weapons-grade uranium to low-enriched uranium that could not be used to make a nuclear explosive if stolen or diverted. CBG, working closely with the Nuclear Control Institute (NCI),

---

[10] This precedent remained in place until the Commission in 1993 revised its regulations to exempt most research reactors from protection against terrorist attack. 59 FR 13699 This unfortunate regulation revision is one which the Commission should revisit in light of 9/11, and CBG may subsequently petition for rulemaking to that effect, but research reactors are not encompassed in the current petition for rulemaking.

played a significant role in the rulemaking proceeding.[11] This decision by the Commission to move toward ending the use of bomb-grade uranium in research and test reactors resulted in dozens of bombs-worth of HEU being removed from poorly protected locations, a significant non-proliferation and counter-terrorism step.[12]

In 1985, CBG began a two-decade long effort, much of it in cooperation with NCI, to have the NRC revise the Design Basis Threat regulations for nuclear power plants.[13] On May 7, 1985, CBG's President, Daniel Hirsch, then also serving as Director of the Stevenson Program on Nuclear Policy at the University of California at Santa Cruz, along with two colleagues, presented a report to and testified before the Safeguards and Security Subcommittee of the Advisory Committee on Reactor Safeguards, identifying serious deficiencies in the DBT and the need to upgrade it to reflect a growing risk. See "Nuclear Terrorism: A Growing Threat," by Daniel Hirsch, Stephanie Murphy, and Bennett Ramberg, May 7, 1985, Stevenson Program on Nuclear Policy, University of California at Santa Cruz, SNPN-85-F-1, Rev. 1. The report and testimony identified vulnerabilities of nuclear plants to truck bombs and urged revision of the DBT to include vehicular bombs. Also recommended was an upgrading of the "three-and-one" DBT. The study demonstrated that terrorist trends—e.g., dramatic increases in numbers and severity of terrorist incidents-- since the 1970s-era security regulations and DBT were

---

[11] "Limiting the Use of Highly Enriched Uranium in Domestically Licensed Research and Test Reactors" 49 FR 27769 (1984 Proposed Rule) and 51 FR 6514 (1986 Final Rule).

[12] However, the conversions have taken far longer than originally contemplated two decades ago, with a number of domestic research and test reactors still using HEU. Commission action to eliminate the last HEU at remaining reactors and to cease authorizing export of HEU is urgent in the post-9/11 environment, although that matter is also outside the scope of the current Petition.

[13] A more detailed summary of the joint CBG-NCI efforts in this regard can be found in "Publications & Documents on Prevention of Nuclear Terrorism 1984-2001," compiled by Sharon Tanzer, NCI Vice-President, and Steven Dolley, NCI Research Director, available in the "Nuclear Terrorism" section at www.nci.org.

promulgated had far outstripped and undermined the assumptions upon which those rules were based, necessitating that they be upgraded promptly.

Members of the ACRS Safeguard and Security Subcommittee declined to recommend adoption of the proposals, arguing that if the truck bomb risk and inadequate size of the DBT's presumed attacking force were remedied, there would still remain many other ways to successfully destroy a nuclear plant and that if NRC were to agree to our suggestions, it would have to address those other security vulnerabilities too, which it was apparently unwilling to do.[14] One of the ACRS members further stated, as an argument against enhancing protection against terrorist attack on reactors, that terrorists were not interested in killing more than a few people: "I find myself not knowing a case even in history in which terrorists have directed an attack whose purpose it is to kill thousands of uninvolved, if you might say, innocent people."[15] 9/11 would of course tragically demonstrate how wrong this assumption was.

Our recommendations for updating the DBT were followed in March 1986 in an article by the same authors in the *Bulletin of the Atomic Scientists*, entitled "Protecting Reactors from Terrorists," and in 1987 in a chapter by Daniel Hirsch in the book *Preventing Nuclear Terrorism* (eds. Paul Leventhal & Yonah Alexander, Lexington Books), entitled "The Truck Bomb and Insider Threats to Nuclear Facilities." In 1988, Daniel Hirsch and NCI once again urged that the NRC upgrade the DBT, at a hearing on "Threat of Sabotage and Terrorism to Commercial Nuclear Powerplants" held by the Subcommittee on General Oversight and Investigations of the House Committee on Interior and Insular Affairs on March 9. In June 1988, NRC again decided

---

[14] Transcript, In the Matter of the Advisory Committee on Reactor Safeguards, Subcommittee on Safeguards and Security, USNRC, May 7, 1985, pp. 72-3, 77-8, 96-7

[15] *ibid.*, p. 55

not to change the DBT nor to require long-range planning by licensees for protection against vehicular attacks.

On January 11, 1991, CBG and NCI submitted to the Commission a Petition for Rulemaking and Request for Emergency Action, requesting that the NRC upgrade the DBT to include explosives-laden vehicles and "a larger number of attackers using more sophisticated weapons than presently contemplated." The Petition stated, "Current trends in terrorism indicate that the present design basis threat is not realistic." In particular, we requested the DBT be upgraded to *20 external attackers* (tragically ironic in light of the subsequent 9/11 number of attackers) from the three then presumed in the regulation, that the attackers be presumed to act in coordinated teams, something precluded from the existing DBT regulations, and that protections against truck bombs be required.[16] See 56 FR 3228, January 29, 1991. The Commission rejected the Petition, arguing in part that it was not realistic to assume a truck bomb would be used in the United States nor that there could be attackers in numbers larger than three or in more than one team. 56 FR 26782, June 11, 1991.

Declining to drop the matter, on September 4, 1991, CBG and NCI submitted a Request for Action to institute an individual plant examination program to evaluate the margin of nuclear power reactors to withstand safeguards events beyond the current design basis. On December 31, 1991, that petition was also denied, with the NRC pointing out that its regulations "do not require licensees to design safety systems to be resistant to various acts of sabotage."

The first World Trade Center truck bomb attack, in 1993, coupled with the TMI intrusion event earlier the same year, undercut the Commission presumption about the lack of a domestic truck bomb threat, which had formed a key basis for its denial of the CBG-NCI 1991 truckbomb

[16] The 1991 Petition noted in a footnote that there is also a potential threat from an airplane, but that the Petition wasn't seeking its inclusion in the DBT at that time.

rulemaking petition. (As discussed below, the second World Trade Center attack, on 9/11/2001, has similarly eliminated the presumption that 20 attackers is an unreasonable assumption.)

The TMI intrusion event—in which an intruder drove a station wagon through the main gate, crashed through fences into the "protected area" of the plant, and into the turbine building, where he remained for hours—revealed the vulnerability of nuclear plants to vehicular attacks. Twelve days after the TMI incident, CBG and NCI requested that the NRC reopen our Petition for Rulemaking.[17]

The importance of such a reassessment was tragically reinforced a few days later when the World Trade Center was bombed. As the NRC subsequently stated, in responding to our February 19, 1993, request to reopen the DBT rulemaking to require protection against truck bombs, "On February 26, 1993, 7 days after the date of your letter, the World Trade Center in New York City was bombed using a van to transport the explosive material."[18]

The TMI incident, followed a couple of weeks later by the World Trade Center bombing, led the Commission to agree in early March to our request to reconsider the DBT upgrades we had proposed and which it had previously denied.[19] The Commission decided to undertake its review in two phases, beginning with consideration of adding protections against vehicular attacks, to be followed by consideration of upgrading the portions of the DBT that deal with numbers and characteristics of attackers.

---

[17] "Request to Reopen Petition for Rulemaking and Request for Action," Daniel Hirsch (CBG) and Paul Leventhal (NCI) to then Chairman Ivan Sellin, February 19, 1993.

[18] April 6, 1993, Letter to Hirsch and Leventhal from Thomas E. Murley, Director, Office of Nuclear Reactor Regulation.

[19] See March 1, 1993, memorandum "Design Basis Threat" from Samuel J. Chilk, Secretary of the Commission, to James M. Taylor, Executive Director for Operations; and memorandum "Design Basis Threat Reevaluation – Proposed Action Plan," March 11, 1993, from James M. Taylor to the Chairman and Members of the Commission.

In late 1993, the NRC proposed revisions to the DBT to include protections against land vehicles. CBG and NCI actively participated in that rulemaking.[20] In 1994, those rule changes were formally adopted.[21] In the ensuing decade, however, no rulemaking has been initiated regarding Phase II of the promised DBT revision – upgrading the numbers and capabilities of the presumed attacking force. Nor has there been any rulemaking to consider protections against attacks involving other than land vehicles, e.g., attacks from the air. This Petition for Rulemaking attempts to remedy that situation.

On April 19, 1995, another devastating truck bomb attack occurred in the U.S., destroying the federal building in Oklahoma City. The size of the explosive was reportedly larger than that used at the World Trade Center. On November 6, 1995, CBG and NCI wrote to then-Commission Chair Shirley Jackson expressing concern that the recently adopted truck bomb rule might not contemplate a bomb as large as the Oklahoma City explosive and urging prompt action to assure that the Commission wasn't "fighting the last war" instead of establishing requirements based on the magnitude of prospective future threats.

On August 25, 1998, CBG and NCI again wrote to NRC Chair Jackson expressing concern about adequacy of protections of domestic nuclear plants, following al Qaeda bombings of American targets in Kenya and Tanzania and U.S. retaliation in Sudan and Afghanistan. The letter called for placing plants on maximum security and upgrading long-term security measures.

---

[20] See, e.g., "Considerations Related to Reassessment of the Design Basis Threat for Radiological Sabotage," by Steven Sholly, Senior Consultant, MHB Technical Associates, presented on behalf of CBG and NCI, at NRC Public Meeting on the Design Basis Threat, Rockville, MD., May 10, 1993.

[21] 58 FR 58804-7, "Proposed Rule: Protection Against Malevolent Use of Vehicles at Nuclear Power Plants," November 4, 1993; 59 FR 38889-38900, Final Rule, August 1, 1994.

In its response (December 21, 1998) the NRC again declined to take the requested steps to upgrade security requirements.

On November 3, 1998, CBG disclosed the Commission's decision to terminate, over the objections of a number of its security specialists, the Operational Safeguards Response Evaluation (OSRE) program, the NRC's only counter-terrorism program. Also disclosed was the high rate of failure in OSRE tests, despite half a year of advance notice of when the force-on-force test would occur and the enlargement of the guard force just for the OSRE test. The disclosures in the press resulted in an outcry from the public and elected officials that led the Commission to reinstate the program.

On December 23, 1999, in the midst of widespread concern that there might be terrorist attacks in the U.S. during the upcoming millennium celebrations, CBG and NCI wrote NRC Chair Meserve expressing concern that the Commission had issued a December 21 advisory to nuclear plant operators saying that there was no need for it to order increased security precautions in anticipation of a possible millennium terrorist attack. The CBG-NCI letter noted, "Given the unique devastation that would result from the release of the intensely radioactive contents of the core of a one-billion-watt nuclear power plant in the event of a meltdown caused by sabotage, it is inexplicable that the only major Federal agency not increasing security against terrorists during the millennial period is the NRC." The Commission's position was that it would get specific advance notice of any planned attack on a particular reactor and in the absence of such specific warning, no increased protections were required. However, it turned out a terrorist had indeed planned a millennial attack, on the Los Angeles airport, and it was

foiled, not by advance intelligence, but by a fortuitous customs inspection at the U.S.-Canada border that by chance found explosives being brought into this country by the terrorist.

On February 7, 2000, representatives of CBG and NCI met with NRC Chairman Meserve at NRC headquarters, to urge him to make a high priority of upgrading the DBT and associated security regulations. However, the Commission continued to take no such action, again asserting there was no intelligence regarding a specific threat to a specific reactor in the U.S.

On September 11, 2001, four jumbo jets were hijacked by 19 al Qaeda terrorists who had planned their attacks for years, including learning how to fly such jets. Three of the four planes succeeded in crashing into their intended targets – the World Trade Center and the Pentagon – causing thousands of deaths. It has now been disclosed by the 9/11 Commission, as discussed earlier, that the original plan involved ten planes, some of which were to be targeted at domestic nuclear power plants. One of the 9/11 planes flew over the Indian Point reactor on its way to its terrible end.

The NRC, in response to press inquiries, asserted there was no risk from such air attacks to reactors because containments were supposedly designed to withstand the impact of a fully loaded jumbo jet of the size used in the 9/11 attacks. A couple of days later that statement had to be withdrawn and the Commission acknowledged that nuclear plants were not in fact designed to withstand such impacts.

On September 14, 2001, CBG and NCI wrote Chairman Meserve, urging a series of immediate emergency security steps at reactors and the adoption of the long-recommended permanent upgrades to the DBT. On September 21, Chairman Meserve replied for the Commission; the reply was at best noncommittal. Having exhausted its efforts – extending over

many years – to get the NRC to significantly upgrade the DBT, the two organizations held a press conference at the National Press Club on September 25, to publicly urge prompt action to resolve the continuing vulnerabilities.[22]

Legislation was subsequently introduced by Congressman Markey and others to require the NRC to upgrade the DBT to include numbers and capabilities of attackers equal to or greater than that witnessed on September 11. NRC and the industry opposed the legislation.

On October 11, 2001, CBG's Daniel Hirsch wrote, at the request of the *Los Angeles Times*, an Op Ed article calling for the NRC to finally upgrade significantly the DBT and in the meantime to arrange for the posting of the National Guard at U.S. reactors. In the January/February 2002 issue of the *Bulletin of the Atomic Scientists,* he detailed the long history of problems with the quarter-century-old "three-and-one" DBT and the failure of the Commission to bring it up to 9/11 levels.

In the May/June 2003 edition of the *Bulletin of the Atomic Scientists,* CBG's Daniel Hirsch, NCI's Edwin Lyman, and Dave Lochbaum from the Union of Concerned Scientists further identified the continuing failure to act to bring security up to levels consistent with 9/11 threats. In the same edition, CBG's Joel Hirsch proposed his "Beamhenge" concept, discussed further below, of construction of I-beam shields at standoff distances from sensitive reactor structures to provide physical protection against air attacks. The Beamhenge approach has a number of tremendous advantages including 1) its likely extremely low price (estimated to be as low as 0.25% of the construction price of some of these facilities) and 2) its relatively fast deployment (estimated to be as little as 90 days for some facilities).

---

[22] The transcript of the press conference and the written statements released by CBG and NCI are available at www.nci.org ("Nuclear Terrorism" link, section on "Are Reactors Adequately Protected Against Attack?")

Shortly thereafter, NRC issued secret "orders" that purportedly alter the DBT without revising the still-current DBT regulations in the Code of Federal Regulations. While the alterations are not public, the Commission has been frank that they do not require protection against the numbers of attackers found on 9/11, nor against air attack.[23] Whatever the legality of the secret orders, worked out behind closed doors with the regulated community but excluding the public from any aspect of the policymaking—a matter now challenged in court—it is clear that upgrades remain urgently in order to bring the threat basis up to 9/11 levels. We hereby petition for that to be done promptly. The long pattern described above, extending over decades, of the Commission being "behind the curve" in protecting reactors against terrorism must end, and end quickly, before there is a disastrous event.

The Commission should consider this Petition somewhat analogous to the memorandum transmitted to National Security Advisor Condoleezza Rice from White House terrorism official Richard Clarke a few days before 9/11, warning that an event of those proportions was possible and that responsible officials would have much to account for if they didn't take all reasonable steps to prevent it. He wrote on September 4, 2001, after years of frustration in trying to get the threat taken seriously at top levels of government, that the "real question" was "are we serious about dealing with the al Qida threat? ... Is al Qida a big deal? ... *Decision makers should imagine themselves on a future day [they have] not succeeded in stopping al Qida attacks and*

---

[23] See, e.g., NRC statements cited by Edwin Lyman in "Nuclear Plant Protection and the Homeland Security Mandate," 44th Annual Meeting of the Institute of Nuclear Materials Management, Phoenix, AZ, July 2003.

hundreds of Americans lay dead in several countries, including the US ... What would those decision makers wish that they had done earlier? That future day could happen at any time."[24]

CBG has tried for twenty-five years to get the Commission to fix the vulnerabilities of nuclear facilities to terrorist attack, and can only urge the Commission in the strongest possible terms to finally act, and act now, before there is a successful terrorist attack on a U.S. nuclear plant that could release catastrophic amounts of radioactivity. We can only warn and implore now: "Imagine a few weeks after a successful terrorist attack on a nuclear plant, with thousands of Americans dead from radiation sickness, and tens of thousands destined to die subsequently from radiation-induced cancer, and ask yourselves what you could have done earlier."

III. Lessons from Historical Review of the Issue—Too Little, Too Late

The above review of Petitioner's quarter-century of efforts to get the Commission to take effective action in light of the rising terrorist threat, and the resistance to taking those steps, suggests certain lessons.

The Commission's DBT regulations remained essentially unchanged, with one exception, for nearly thirty years, despite dramatic increases in terrorist incidents, casualties, and capabilities. Decades of warnings about the increasing risk yielded no response to change the regulations.

The exception is the truck bomb rule, but that took a decade of warnings by CBG and NCI, and rejection of our rulemaking petition, before events – the World Trade Center truck bombing and the TMI intrusion event – overtook Commission denials and compelled it to

[24] NSC memo, Clarke to Rice," Observations at the Principals Meeting on Al Qida," Sept.4, 2001 (text italicized here is underlined in the original), as cited at p. 212 in *The 9/11 Commission Report,* issued July 22, 2004.

provide some protection for reactors against truck bombs. Even then, questions persisted as to whether the Commission remained "behind the curve" on that issue, protecting against smaller truck bombs than were possible and indeed subsequently occurred in the U.S. (Oklahoma City).

The Governor of the State of California in the early 1980s argued in the Diablo Canyon licensing case that it was credible that there could be a dozen attackers and security should be designed to deal with such an assault. NRC ruled that the maximum attacking force that could occur was one fourth that size. In the early 1990s, CBG and NCI petitioned the NRC to increase the DBT regulations to an attacking force of twenty, in multiple teams. NRC again ruled that attacks of more than three individuals in one team were non-credible and that nuclear plants need not have security to deal with attacks of greater magnitude. It need not be said, of course, that 9/11 involved 19 attackers in 4 teams.

Even with that minimal DBT, nearly 50% of nuclear plants failed OSRE tests, in which the 3 mock terrorists were able to simulate destruction of at least one target set, sufficient to cause serious core damage, despite half a year advance warning to the plant's security of precisely when the mock attack would occur. The Commission's response to the failures revealed by OSRE was to shut it down, only reinstated after CBG disclosed the termination.

The Commission's rationales for the minimal DBT have repeatedly over the years been contradicted by subsequent events. It was argued that there were "moral restraints" on terrorists so that they would only undertake symbolic actions involving a few deaths and were uninterested in large numbers of casualties. The various large-scale terrorist events over the last two decades, culminating in the 9/11 tragedy, have demonstrated that assumption to be completely unrealistic.

Similarly, the Commission argued it would get advance intelligence of any threat to a specific nuclear plant so that compensatory security measures could be put in place prior to any

attack. 9/11 and a host of other surprises demonstrate that one cannot rely on prior warning of an impending attack on specific targets.

The Commission relied on an additional assumption for establishing its minimalist DBT: intelligence information that there were no known groups "having the combination of motivation, skill, and resources to attack either a fuel facility or a nuclear power reactor."[25] This has clearly been shown not to be true, but the DBT has not been amended to encompass the magnitude of threat we now know exists – attacking groups of a score or more, in multiple coordinated teams; planning for years, even to the extent of learning to fly jumbo jets; willingness to die and to take massive casualties along with them; ability to use creative techniques and significant technological assets (again, such as planes); and so on.

The Commission has been "fighting the last war" in its approach to upgrading security rather than anticipating threats in advance and providing necessary precautions. No truck bomb protections were required at nuclear plants until a truck bomb finally was used against a major U.S. target, the World Trade Center, despite a decade of our warnings about such a risk. And even when events do overtake the Commission's rules and the underlying assumptions, as in the case of 9/11, the rules do not change – 10 CFR 73 still has the same DBT and still requires no protection against planes or more than a few ground attackers. Even the secret orders issued recently, of questionable legality, are conceded to not protect against a 9/11-magnitude size attacking force nor to require protections against air assault. That must change, now, before a successful attack on a reactor occurs.

---

[25] 42 FR 10836. For a more detailed discussion of some of the outmoded assumptions relied upon for the DBT rule, see Hirsch et al. "Nuclear Terrorism: A Growing Threat" *op cit.*

IV. Secrecy Concerns

Petitioner recognizes that certain detailed aspects of security precautions at nuclear power plants should not be made public. This Petition for Rulemaking contemplates no such disclosures.

Whatever the Commission ends up deciding is an appropriate margin of safety *above* the numbers of attackers involved in 9/11 (nineteen), were the Petition to be granted, should arguably be kept secret. All that this Petition proposes is that the DBT be set at a number and capability that equals 9/11 numbers and capabilities, *plus* an unspecified margin of safety. As such it is entirely appropriate for public rulemaking. Should the Commission continue to decline to require protection at nuclear plants against a 9/11 magnitude adversary, that should be a matter of public debate. Should the Commission consent to upgrading the Design Basis Threat to a level at least equal to 9/11 capabilities and numbers, the precise level above that 9/11 threat need not be made public.[26] Similarly, there is nothing sensitive about proposing a policy that requires protection of reactors against air attack and suggesting physical barriers at standoff distances (Beamhenge) to provide that protection.

[26] We note that this is the process historically used by the Commission in security rulemakings. For example, the Commission adopted—after petitions by CBG and NCI—amendments to the DBT and security requirements in Part 73 that required protection against vehicular bombs. Some detailed features of the implementation of security plan modifications were kept secret, but the fundamental requirements for protecting against truck bombs were included in the public rulemaking. Likewise, what is proposed in this Petition is that the DBT be similarly modified to require protection against air attacks, as it was previously for land vehicles; that stand-off barriers be required, as they were for truck bombs; and that the DBT characteristics regarding numbers and capabilities of attackers be increased to some unspecified level *above* the nineteen of 9/11.

We recognize that the Commission had adopted Orders post-9/11 that purportedly somewhat enhance the DBT, although the Commission has been frank that the secret Orders do not contemplate a DBT comparable to the numbers and capabilities employed on 9/11. We also recognize that the legality of those Orders has been challenged in court as violating the Administrative Procedure Act requirement of notice-and-comment rulemaking, as the Orders were worked out in closed-door sessions between the regulators and the regulated community, with the public excluded from all aspects of the process. Given the fact that the longstanding DBT enshrined in 10 CFR 73.1 remains unaltered in the Code of Federal Regulations, and the case law interpreting that regulation similarly has not been disturbed, there is serious question whether the secret Orders have any effect in revising the DBT. In any event, it appears clear from numerous Commission statements and actions that neither the existing DBT in the regulations nor any modified DBT which may exist in the secret Orders – irrespective of the legality of the latter – contemplate protections against air attacks or against ground attacks in numbers and sophistication equivalent to what was seen on 9/11.[27] In response to the court challenge, NRC has in fact encouraged submission of public Petitions for Rulemaking to revise the DBT, which we do hereby.

[27] When we refer to 9/11 threat levels, we are of course referring to 19 terrorists in 4 teams. It would be misleading were regulators to refer instead merely to the numbers in each team (4-5 terrorists) as the 9/11 threat level.

V. Proposed Changes to NRC Security Requirements for Protection of Nuclear Power Plants from Terrorist Attack

1. *Amend the Design Basis Threat Rule at 10 CFR §73.1(a)(1) to Encompass Attacking Forces Equal to Those of 9/11, Plus a Margin of Safety, in Numbers, Teams, Capabilities, Planning, Willingness to Die, and Other Characteristics.*

The DBT should be changed to include at least 19 attackers, plus a margin of safety above that level.[28] It should contemplate multiple coordinated teams. The attackers should be presumed to use a full range of potential weapons of which a group such as al Qaeda would be capable, include shaped charges, shoulder-fired rockets, mortars, anti-tank weapons, large quantities of explosives, etc. The explosives, weapons, and equipment need not be limited to hand-carried items, as the current 10 CFR §73.1(1)(i)(D) presumes. They should be presumed to be ruthless, highly motivated, willing and even intent on dying, very creative, thorough, with long planning and preparation.

The DBT should include a minimum of three insiders, in addition to the >19 external attackers, rather than the current 1 insider assumed at 10 CFR §73.1(1)(i)(B) and (ii). The insiders should be presumed to play both a passive role (e.g., supplying information) and active capacity (e.g., directly participating in a coordinated attack or separate sabotage actions). The land vehicle should not be limited to a four-wheel drive car or truck, as is now the case at 10

---

[28] As indicated above, the Commission has purported to amend the DBT by issuing secret Orders, without amending the DBT regulation, but has conceded that the DBT in the Orders does not encompass a 9/11-level threat. Recently, the General Accounting Office found that the Department of Energy's post-9/11 updated DBT – presumably more rigorous than the NRC's – is generally smaller than the threat the U.S. intelligence community has formally concluded exists now. "While the May 2003 DBT [DOE revision] identifies a larger terrorist threat than did the previous DBT, the threat identified in the new DBT in most cases is less than the threat identified in the intelligence community's Postulated Threat, on which the DBT has been traditionally based." GAO-04-623, April 2004. *NUCLEAR SECURITY: DOE Needs to Resolve Significant Issues Before It Fully Meets the New Design Basis Threat.* If the DOE DBT is less than the threat assumed by the intelligence community, that is even more true for the NRC's DBT -- which is certainly no greater than DOE's and generally presumed to be smaller.

CFR §73.1(i)(E) and (iii) but include the full range of trucks and other vehicles that a group like al Qaeda might employ for such an attack.

The DBT should also include attacks not merely by foot or by land vehicle (e.g., vehicle bombs), but by boat and by air. The air attack DBT should include a fully loaded jumbo jet of maximum size in commercial service and full fuel tanks, but also include more maneuverable smaller planes and helicopters. It should consider explosives potentially present in the aircraft as well as the mass of the plane and the effect of its fuel when igniting. The DBT should protect both against direct impact of the aircraft on sensitive facilities at the nuclear plant but also against use of the aircraft or helicopter for dropping explosives on those facilities. And the air attack DBT should consider coordination of such an attack with assistance from insiders at the plant and/or external attackers (i.e., damage to systems from the air attack coupled with failure of backup systems due to coordinated action on the ground)

2. *Amend the Enabling Regulations at 10 CFR Part 73 and Associated Requirements to Mandate Security Plans, Systems, Inspections, and Force-on-Force Exercises Protect Against the Amended DBT.*

Security plans and physical systems implementing those plans, inspections and force-on-force OSRE exercises must be upgraded to conform to the new DBT proposed above. They must demonstrate high confidence to be able to repel a 9/11-level assault.

3. *Require Prompt Construction of Shields from Air Attack – "Beamhenge" – at Standoff Distances from Key Support Structures at Nuclear Plants.*

Nuclear power plants were not designed to be able to withstand the attack by a fully loaded jumbo jet nor the intentional use of airplanes for terrorist purposes. A study commissioned by

the German government found that its nuclear plants are vulnerable to such an attack:

> A report the government had commissioned after the Sept. 11, 2001 terrorist attacks in the United States in which the German Society for Power Plant Safety concluded that none of Germany's 18 operating nuclear plants was sufficiently protected against an air crash intended to penetrate into a reactor and provoke a devastating dispersal of radioactivity. According to the report, Germany's oldest nuclear plants are the most accident-prone, meaning that even the crash of a small jetliner could cause a major nuclear disaster, while it would take "the targeted crash of a large airplane" to blow up one of the newer plants.[29]

Conversely, the U.S. nuclear industry has commissioned a study by an industry group to argue against such vulnerability. However, that study presumes a slower approaching speed for the attacking plane than is reasonable, and fails to consider potential effects of attacks on structures other than containment or attacks coordinated with ground attacks or insider assistance.

As the Union of Concerned Scientists has pointed out,[30] there are numerous soft targets outside of containment essential to safety of a nuclear reactor and attacking them could be very serious. Additionally, the spent fuel pools are of substantial concern, holding multiple cores and very large inventories of long-lived radioactivity.

We have proposed construction of shields composed of I-beams with steel or other cabling and netting between them at standoff distances around the key structures at nuclear plants. Attacking planes would thus crash into the shield rather than the reactor structures, leaving the sensitive reactor facilities intact. The Beamhenge concept may also provide some

---

[29] *Frankfurter Allgemeine Zeitung,* Jan. 9, 2004. See also "Fake fog could defend nuclear plants," *New Scientist,* January 12, 2004. An English translation of excerpts of the German study "Protection of German nuclear power plants against the background of the terrorist attacks in the USA on 11 September 2001" is at www.greenpeace.org.br/nuclear/pdf/crash_nukes.pdf.

[30] Union of Concerned Scientists, "Nuclear Reactor Air Defenses" http://www.ucsusa.org/clean_energy/nuclear_safety/page.cfm?pageID=1155

measure of protection against such weapons as shoulder-launched rockets, causing them to detonate before reaching their intended target.

I-beams are relatively inexpensive, and their installation can be done quickly and with modest expenditures. We estimate Beamhenge shields could be constructed for a fraction of one percent of the original construction cost of the nuclear plant. A more detailed discussion of the Beamhenge concept proposed here is found in Joel Hirsch, "Beamhenge," *The Bulletin of the Atomic Scientists,* May/June 2003, pp. 46-7; that discussion is incorporate herein by reference. With such a low price and relative ease of deployment, we believe the burden is on the Commission to justify why implementation of the Beamhenge approach should not be mandated immediately. This Petition requests that such shields against air attack be required to be promptly constructed at the nation's nuclear plants, on a time urgent basis. Time is not with us in terms of protecting reactors from attack.

VI. Conclusion

For a quarter of a century CBG has urged, and at times implored, the Commission to upgrade the protections of U.S. nuclear plants against terrorist attacks. The horrendous events of 9/11 must end any complacency in that regard. It is inexplicable that nearly three years after that terrible tragedy, the NRC still does not require protection of American reactors against the number and sophistication of attackers we saw on that awful day, nor does it require protection against air attack. That must change, quickly, or we run the risk of a catastrophe beyond comparison in the annals of terrorism.

As 9/11 Commissioner James R. Thompson, former governor of Illinois, said at the press conference releasing the final 9/11 Report[31]:

> Everyone was caught unawares by Sept. 11, the president, the Congress, the American people, law enforcement agencies. Blame, if there's blame, has to be spread all across the board because the American people never demanded more or better. But now we've been warned, specifically warned. And now we've been told by everyone, from the president of the United States on down, it's going to happen again. And if it happens, and we haven't moved, then the American people are entitled to make very fundamental judgments about that.

9/11 Commissioner Thompson continued, "Our reform recommendations are urgent .... If something bad happens while these recommendations are sitting there, the American people will quickly fix political responsibility for failure -- and that responsibility may last for generations."[32] The same is absolutely the case for the NRC regarding the recommendations here to finally bring reactor security requirements up to levels consistent with the post-9/11 threat environment. Failure to do so can result in a successful terrorist attack that releases radioactive contamination over wide areas lasting for generations. We therefore urge, in the strongest possible terms, that the Nuclear Regulatory Commission act *now* to require reactors to be protected from a 9/11 magnitude of terrorist act, before it is too late.

Respectfully submitted,

Committee to Bridge the Gap
1637 Butler Avenue, Suite 203
Los Angeles, California 90025
(310) 478-0829

Daniel Hirsch
President

Joel Hirsch
Attorney for CBG

July 23, 2004

---

[31] As quoted in "Swift Action on Advice From the 9/11 Commission Is Unlikely," *New York Times,* July 23, 2004.
[32] quoted in "9/11 Report Calls for a Sweeping Overhaul of Intelligence," *New York Times*, July 23, 2004.