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THE POTENTIAL TERRORIST THREAT TO
COMMERCIAL NUCLEAR FACILITIES

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THE POTENTIAL TERRORIST THREAT TO COMMERCIAL NUCLEAR FACILITIES*

INTRODUCTION

In recent years, increases both in the total volume of terrorist incidents worldwide and the casualties resulting from such incidents have prompted renewed concern that terrorists might attack a nuclear facility. Among the reasons cited to explain the likelihood of such an attack is that as terrorism has become more frequent, public attention is not so readily claimed as it once was. Terrorists, therefore, have been forced to undertake more spectacular and, unfortunately, bloodier deeds. Accordingly, actions involving nuclear material or weapons may have become more attractive to some terrorist groups. In addition, state-sponsorship of terrorism, that is, support of terrorist organizations by foreign governments, has also increased significantly, providing terrorists with far greater capabilities than they have had in the past, while eliminating some of their constraints.

As a result of these developments, in 1986 the Department of Energy (DOE) reviewed its adversary characterization and threat definition guidelines then in force and decided to place greater emphasis on guard weaponry, training, and tactical response exercises and to upgrade some physical security measures. The Nuclear Regulatory Commission (NRC) is now proposing to amend its physical protection and security personnel performance regulations to a level equivalent to the protection in place at comparable DOE fuel facilities.¹ I have been asked to address the question of whether the NRC's "design basis threat"¹ is realistic in

*Testimony presented before the House of Representatives Committee on Interior and Insular Affairs, Subcommittee on General Oversight and Investigations on March 9, 1988.

¹The "design basis threat" as it currently stands does not "recognize the possible use of land vehicles for the breaching of perimeter barriers and transporting adversary personnel and their equipment." Instead, it assumes that adversary personnel would enter the facility on foot in order to carry out an attack. See *Federal Register*, Vol. 52, No. 251, December 31, 1987, pp. 49418-49420.

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light of the current terrorist threat in the United States and whether this threat definition should be modified to include the use of vehicle (e.g., truck) bombs.

As you may know, The RAND Corporation has long been involved in research concerning the nuclear terrorism issue. During the 1970s, we assisted in the development of the DOE threat guidelines² and in 1986 RAND participated in the reassessment conducted by the DOE.³ During the past two years, we have been involved in a follow-on research effort to describe the spectrum of capabilities of individuals and groups that could be considered likely to attempt the takeover of a nuclear facility or theft and misuse of a nuclear weapon over the next 10-15 years. My testimony summarizes the results of RAND's recent work on this issue.⁴ The views I will express today, however, will be my own; they do not necessarily represent those of The RAND Corporation or any of its research sponsors.

IS THERE A TERRORIST THREAT TO NUCLEAR FACILITIES?

Because of the extreme consequences that might result from *any* nuclear-related act of terrorism, even the remotest likelihood of one cannot be dismissed as insignificant. In that respect, risk analysis of threats to nuclear facilities differs from other risk analyses: One is one too many.

²See Peter deLeon et al., *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs* (Santa Monica, CA: The RAND Corporation, R-2225-SL, February 1978); Gail Bass et al., *Motivations and Possible Actions of Potential Criminal Adversaries of U.S. Nuclear Programs* (Santa Monica, CA: The RAND Corporation, R-2554-SL, February 1980); and, Gail Bass et al., *The Appeal of Nuclear Crimes to the Spectrum of Potential Adversaries* (Santa Monica, CA: The RAND Corporation, R-2803-SL, February 1982).

³See Bruce Hoffman et al., *A Reassessment of Potential Adversaries to U.S. Nuclear Programs*, (Santa Monica, CA: The RAND Corporation, R-3363-DOE, March 1986); and, Bruce Hoffman, *Terrorism in the United States and the Potential Threat to Nuclear Facilities* (Santa Monica, CA: The RAND Corporation, R-3351-DOE, January 1986).

⁴See Peter deLeon, et al., *The Threat of Nuclear Terrorism: A Reexamination* (Santa Monica, CA: The RAND Corporation, N-2706, January 1988); and Bruce Hoffman, *Recent Trends and Future Prospects of Terrorism in the United States* (Santa Monica, CA: The RAND Corporation, R-3618, May 1988).

Various strategies and motivations, which have remained consistent throughout the past decade, could lead terrorists into the nuclear domain. Terrorists might attack a nuclear facility either to gain publicity for themselves and their cause, to create a barricade-and-hostage situation involving facility employees for the purpose of blackmail, to steal strategic nuclear material for their use or for a patron state, or to sabotage or destroy the facility itself. Accordingly, broad distinctions can be made among acts designed primarily for demonstration or propaganda purposes, acts aimed at coercing concessions from authorities, and acts of outright destruction. These are not pure types, however, and a given terrorist crime may reflect elements of more than one strategy. All terrorist acts, for example, including acts of nuclear coercion or destruction, have propaganda--the swaying of public opinion--as one of the their aims.

Terrorists driven by opposition to nuclear power or nuclear weapons, or seeking to co-opt antinuclear sentiment for their own radical political agenda, might stage a "demonstration" action against a nuclear facility. Such actions as breaking down fences, shooting at a guard, phoning a bomb threat, or lobbing mortar rounds would, of course, interfere with the operations of the facility. But the main intent would be propaganda: to ridicule the plant authorities and, by implication, the government for inadequate security, and thus arouse public concern about nuclear safety. Such demonstration attacks by dedicated opponents, it should be noted, can probably never be prevented entirely.

At the other end of the scale of potential lethality would be scenarios in which terrorists take over a nuclear facility, threaten to explode a stolen nuclear device, or cause contamination with nuclear material unless specific demands are met. Such hypothetical schemes of nuclear coercion would indeed seem to offer terrorists much greater leverage to extract concessions from governments than have their--often successful--kidnappings, hijackings, and embassy takeovers in the past. Despite its popularity as a fictional theme, however, no such act of nuclear blackmail has occurred.

There appear to be several reasons why this has not occurred. First, the vast majority of terrorist organizations are not particularly innovative. Radical in their politics, they are conservative in their operations. They seem hesitant to recognize and take advantage of new situations, let alone create new opportunities. The internal dynamics and decision-making process within terrorist groups often work against any dramatic break from prior terrorist tactics and frequently inhibit sudden escalations in either those tactics or in the actual dimensions of group violence.

Second, the risks associated with stealing and then handling nuclear material would be tremendous, as would the technical expertise required. As with their motivations and strategies, terrorists' capabilities have not changed in the past decade. Terrorists are generally not knowledgeable in nuclear technology, whereas they have mastered the components of "conventional" terrorist attacks. Even if terrorists were willing to assume the risks and had the necessary expertise, nuclear coercion appears problematic for them for other reasons. Terrorists, like other blackmailers, are reluctant to mount threats that they are not prepared to fulfill if their demands are denied. Where terrorists have threatened to execute prominent hostages (for example, Italy's Red Brigades in the kidnapping of former Prime Minister Aldo Moro and West Germany's Red Army Faction in the abduction of wealthy industrialist Hanns Martin Schleyer), they have indeed killed these hostages--possibly with regret--when their demands were not met, for they had to guarantee the credibility of future threats they might make.

If the possibility of having to explode a nuclear device to substantiate a threat were not morally constraining, political and practical considerations would affect terrorists' decisions to put themselves in such a position. It has been argued that there are few realistic demands that terrorists could make (and hope to obtain) from threatening to explode a nuclear device. Such massive destruction could be expected to result in public revulsion, alienating any potential sympathizers to their cause, and trigger severe government measures to

eliminate the terrorists. Foremost is the point that, despite the large measure of accumulated death and destruction terrorists have caused throughout the past two decades, very rarely have they attempted indiscriminate killing on a massive scale. Indeed, as has been demonstrated repeatedly in the past, terrorist goals and objectives can be accomplished through less extreme and less destructive means utilizing the same "low tech" or "off the shelf high tech" weapons (dynamite or plastic explosives, submachine guns or assault weapons, mortars and rocket-propelled grenades, etc.) that they have traditionally relied upon.

Suppose that terrorists were somehow able to obtain a stolen nuclear weapon or acquire nuclear material for a crude device of their own and that the targeted government was willing to negotiate on the terrorists' demands. The authorities would undoubtedly demand the surrender of the nuclear potential as a quid pro quo, leaving the terrorists without a means of guaranteeing the government's delivery of its promised concessions. Indeed, terrorists who release human hostages are also potentially vulnerable to a government double-cross, but it would be easier to capture new hostages than to steal another nuclear device.

Terrorist actions, of course, are not always explicitly coercive, threatening dire consequences unless their demands are met. Terrorists often carry out bombings, assassinations, and other acts of destruction with no specific prior threat or demands, against targets representing what the terrorists consider "enemy" governments or hated institutions. Sometimes random attacks precede the issuing of demands, as was the case in the bombing rampage in Paris during September 1986 by followers of imprisoned Lebanese terrorist leader Georges Ibrahim Abdullah, seeking his release. And sometimes outright destruction is itself coercive. Witness the 1983 truck-bombing of the U.S. Marine barracks in Beirut which, by killing 241 Marines, achieved the terrorists' goal of the withdrawal of the United States from Lebanon. Terrorists could use nuclear weapons in the way that they have used these traditional bombs or they could target a nuclear facility for a serious attack. But these actions would be as unlikely as the use of nuclear weapons for explicit

coercion. Again, the difficulties these weapons would introduce would severely hinder terrorists from achieving goals that they have been able to accomplish through traditional means.

In short, "going nuclear" presents even highly committed terrorists with serious operational and political problems. This is further evinced by the fact that to date there has been no serious incident of nuclear terrorism either in this country or abroad. With the exception of two minor incidents, in which terrorists temporarily occupied nonoperational nuclear plants in Spain and Argentina, terrorists have not attacked nuclear facilities, stolen nuclear weapons or weapon-grade nuclear material, nor even committed credible nuclear hoaxes. What few nuclear crimes appear in the public record have been for personal economic gain or might be considered "nuclear mischief." Even violent demonstrations against nuclear power plants or weapons here or abroad have not led to acts of nuclear terrorism. The constraints, both self-imposed and external, against terrorists' "going nuclear" thus have apparently been stronger than the attractions towards such involvement.

While serious acts of nuclear terrorism remain unlikely, certain configurations of groups and conflict situations, however, would seem more likely than others to give rise to a major nuclear incident. For example, ethnic/religious fanaticism could more easily allow terrorists to overcome the psychological barriers to mass murder than could a radical political agenda. The increased resources of state-sponsored terrorists (and the concomitant use by states of terrorists as instruments of national policy) could provide terrorists with the incentives, capabilities, and resources they previously lacked for undertaking ambitious operations in the nuclear domain. Hence, a terrorist group of religious zealots, with state support, in the context of ongoing violence (e.g., Lebanon, the Iran-Iraq War), could see the acquisition of a nuclear capability as a viable option.

THE TERRORIST THREAT IN THE UNITED STATES TO NUCLEAR FACILITIES

No terrorist group in this country has yet attacked a nuclear facility, nor do we have hard evidence of any group actually contemplating such an attack. Puerto Rican terrorists, however, have twice threatened to attack commercial nuclear energy facilities and on one occasion warned that they would detonate several radioactive devices.⁵ It cannot be assumed, however, that U.S.-based terrorist groups have never seriously considered attacking a nuclear facility or system or that they may not consider doing so in the future. In November 1984 police and federal agents raided a Cleveland safehouse used by the radical leftist terrorist group, the United Freedom Front/Sam Melville-Jonathan Jackson Unit, and found the name of a nuclear weapons research laboratory in New York on a list of potential targets.⁶ In addition, it should be noted that, in November 1987 a bomb hidden beneath a car exploded in the parking lot of the Sandia National Laboratory facility adjacent to the Department of Energy Lawrence Livermore Laboratories in Livermore, California.

Accordingly, one problem in assessing the terrorist threat posed to nuclear facilities and systems is that, in the absence of actual terrorist incidents against such targets, evaluations must be based on the historical record of conceptually similar actions carried out by known terrorist groups in the United States. The historical background, motivation, modus operandi, targeting patterns, and mindsets of the known U.S. terrorist groups must be examined in order to determine which

⁵In 1979, the FALN (*Fuerzas Armadas de Liberacion Nacional*, or Armed Forces of the National Liberation) threatened to blow up New York's Indian Point nuclear energy facility. The following year, during the takeover of the Dominican Republic's embassy in Bogota, Colombia by M-19, a left-wing Colombian group, the FALN, showing "revolutionary solidarity," warned the United States: "You must remember...that you have never experienced war in your vitals and that you have many nuclear reactors." In addition, in 1975, a Puerto Rican group (believed to be the FALN) warned it would detonate 100 bombs, of which 25 were alleged to contain radioactive material.

⁶Federal investigators, however, subsequently determined that the laboratory was not a target under "active" consideration.

of these groups are more or less *likely* than others to attack a nuclear facility.

Based on this assessment of terrorist trends in the United States, the threat posed by terrorist groups in this country to U.S. nuclear programs or facilities cannot be considered high at this time. The general pattern and characteristics of terrorism in the United States supports this argument. Bombing accounts for the vast majority of incidents (47 percent) between 1983 and 1986.⁷ Terrorists' reliance on bombing in this country is not surprising given that bombings annually account for approximately 50 percent of all terrorist attacks committed throughout the world. Although some of the devices are more sophisticated than others (involving elaborate timing mechanisms or designs which trigger explosions when the device is tampered with or otherwise affected), the fact remains that they are generally not particularly innovative in explosive content or construction and most often make use of commercially purchased or stolen dynamite or plastic explosives somehow procured or stolen from military stockpiles.

Moreover, terrorist activity in this country has primarily consisted of symbolic bombings designed to call attention to political causes. That is, while actual bombs or weapons are indeed used, and damage and destruction is often accomplished, the purpose of the attacks is largely to draw attention--albeit, in a dramatic and extreme fashion--to the terrorists and their causes.⁸ The infliction of mass, indiscriminate casualties--as a nuclear terrorist act could potentially cause--would be a significant and dramatic deviation from past terrorist modus operandi. This is further demonstrated by the small number of persons killed by terrorists in the United States.⁹ The majority of terrorist operations are directed against structures--government

⁷Armed attacks/acts of arson are the second most common tactic (accounting for 32 percent of the incidents during this time period).

⁸At the same time, this tendency towards symbolic bombings makes a less serious nuclear incident, e.g., an attack on a facility staged purely for demonstration or propaganda purposes, even more likely.

⁹Terrorists in this country killed only three people in 1986, three in 1985, one in 1984, and eight in 1983 compared to the approximately 19,000 homicides annually recorded in the United States.

offices, military installations, business, airline or tourist concerns, and the like--and not against people.

Finally, terrorists in the United States have consistently avoided attacking *defended* sites. Although some terrorist operations have evinced greater sophistication than others (i.e., in the type of weapons used, the meticulous and detailed planning involved, and the commando-like execution of the attacks), the fact remains that few, if any, have been mounted against defended, much less *well*-defended, targets. This point is of particular relevance to the NRC's proposed security amendments. Terrorists intent on attacking a nuclear facility would presumably be more likely to target a less well-defended nuclear facility, such as an NRC site, compared to the better defended DOE one. Moreover, if the terrorists' intention were simply to create a "nuclear incident," they may not necessarily distinguish between a commercial or military target.

This is not to say that the threat from domestic terrorist groups is negligible. Rather, that based on past *modus operandi*, targeting, motivation, and mindset, there is no indication that any of the terrorist groups currently active in the United States is likely to venture into the nuclear domain in the near future.

Ethnic/emigre groups--such as Puerto Rican separatists, Jewish extremists, anti-Castro Cubans, and Armenian militants--would probably have neither the motivation nor the inclination to attack a nuclear facility unless they were hired by an outside patron-state or intent on blackmail. Islamic terrorist elements in this country would seem the most likely group in this category to become state-sponsored. They have close ties to radical Palestinian terrorist organizations and to Middle Eastern countries such as Libya and Iran.

Leftist groups might be expected to attack facilities to attract attention to ecological issues or to dramatize the alleged dangers of nuclear reactors (a fear heightened since the 1986 incident at Chernobyl). But given the paucity of incidents committed by left-wing terrorist organizations since 1984 as a result of the arrest and imprisonment of nearly all their members and the difficulty that these groups have had in attracting new recruits and spawning successor

generations, it is unlikely that this terrorist movement will pose any significant threat in the near future.

However, trends in the terrorist activities of other terrorist groups in this country are cause for concern and need to be considered in relation to the possibility of operations directed against nuclear facilities. In what appears to be an emerging trend, ideologically-motivated terrorism--by groups espousing a variety of white supremacist and anti-federalist beliefs, as in the case of the right-wing extremists, or in opposition to specific, contentious issues, such as the anti-abortion militants--has supplanted the often parochial, ethnic-centered causes that previously fueled domestic terrorist activity. Throughout the past decade, ethnic-separatist or emigre terrorist organizations committed by far the vast majority of terrorist acts in the United States. They were responsible for more 75 percent of all terrorism in this country between 1974 and 1984. However, during 1985 and 1986 this percentage declined considerably as only 32 percent of all terrorist incidents were carried out by ethnic-separatist or emigre groups. By comparison, right-wing and anti-abortion terrorists were responsible for more than half (53 percent) of all terrorist incidents that occurred in the United States during 1985 and 1986.

The implications of this trend so far as the likelihood of some act of terrorism being committed by right-wing terrorists against a nuclear facility must be considered speculative rather than definitive. There is, admittedly, no indication that any of the members of right-wing terrorist groups possess the requisite technical capabilities to build a nuclear device of their own or to surmount the defense mechanisms even if they were able to acquire a nuclear weapon. Nor, it should be emphasized, is there any evidence that any of the right-wing groups has *seriously* considered staging an attack to obtain one.

However, given that the members of these groups are considerably more skilled with weapons than other terrorists in this country; that they possess large stockpiles of sophisticated armaments, are well-trained in guerrilla warfare, survival techniques and outdoor living; and have an apocalyptic vision of the future driven by an overriding religious imperative--as opposed to the more neatly defined political

aims of the other types of terrorist groups active in this country-- the right-wing extremists would be the most likely terrorist adversary in the United States to attack a nuclear facility or system.

CONCLUSION

To date there has been no serious incident of nuclear terrorism. The constraints, both self-imposed and external, against terrorists "going nuclear" have apparently been stronger than the theoretical attractions toward such involvement. Moreover, the threat to U.S. nuclear facilities posed by terrorist groups in this country cannot be considered high at this time. This conclusion, however, should not be taken to imply that there is no need for the NRC to amend its physical protection and security personnel performance regulations to a level equivalent to that of comparable DOE facilities. This fact alone, that the DOE has upgraded its security procedures, suggests that the NRC should do so as well.

As previously noted, in pursuit of their variegated objectives terrorists might not necessarily make any distinction between targeting a commercial nuclear facility or a military one. In fact, the commercial facility could be the more attractive target if it were were considered by the terrorists to be the less well-defended site. Indeed, past experience of international terrorist tactics has repeatedly shown that increased security at one type of potential target does not negate the terrorist threat, but merely displaces the threat onto a "softer" target. In this respect, the proposed amendments to the "design basis threat" are certainly appropriate.

So far as its relevance to the possible use by terrorists of vehicle bombs, the incident previously recounted at the Sandia facility in Livermore speaks for itself. Although it remains unlikely that terrorists would deliberately seek to destroy a power reactor because of the potentially catastrophic consequences that would follow, less severe types of adversarial actions against nuclear facilities, where the purpose is primarily for demonstration or propaganda purposes, are quite possible.

By the same token, it seems self-evident that the NRC's "design basis threat" should be amended to include land vehicle use by potential adversaries. In each of the six adversary attributes and characteristics (encompassing terrorist assault, robbery, burglary, bombing, sabotage, and commando raid) identified in a previous RAND study of potential threats to domestic nuclear facilities,¹⁰ use of land vehicles figured prominently as a likely mode of transport to the intended target. Another RAND study, which assessed the outcome of a selected sample of raids executed by small organized military forces or irregular paramilitary groups (e.g., guerrilla and terrorist organizations), found that land vehicles had the highest rate of success of all the vehicle types used by raiding parties to travel to and from their targets.¹¹ Surely, the most efficacious and least obtrusive means of reaching NRC sites such as those in semi-rural areas like Uncasville, Connecticut; Erwin, Tennessee; Lynchburg, Virginia; or in a relatively distant suburb such as La Jolla, California, would be by land vehicle.

A defense that would preclude every possible attack for any possible motive is not even theoretically conceivable. Those charged with the security of nuclear facilities--both commercial and military--must be satisfied with doing the best they can, on the basis of the best and most complete available knowledge of all potential adversaries. The situation confronting the defenders is one of constant flux: Technology continues to improve, motivations change, new groups arise, old groups vanish, new modes of terrorism produce new risks, and the sensitivities of public opinion change in unpredictable ways. The defense must therefore be dynamic, to respond as effectively as possible under the most difficult circumstances.

¹⁰deLeon et al., *Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs*, pp. 43-49.

¹¹See Bruce Hoffman, *Commando Raids: 1946-1983* (Santa Monica, CA: The RAND Corporation, N-2316-USDP, October 1985), pp. 14-17.