The Appeal of Nuclear Crimes to the Spectrum of Potential Adversaries

Gail Bass, Brian Jenkins, and Konrad Kellen
with the assistance of Geraldine Petty
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PREFACE

This research was sponsored by Sandia National Laboratories and represents the third phase of a Rand project on the potential threat to U.S. nuclear programs. The findings of the first two phases of the research were reported in R-2225-SL, Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs, February 1978, and R-2554-SL, Motivations and Possible Actions of Potential Criminal Adversaries of U.S. Nuclear Programs, February 1980. The present report examines the relative appeal of specific nuclear crimes to various potential adversaries.
SUMMARY

This report presents the findings of the third phase of a Rand research project on the potential threat of criminal adversaries to U.S. nuclear programs and facilities. The project’s central task is to analyze the attributes and motivations of such potential adversaries, and to determine the types of actions they would find most and least attractive. Such information may help officials responsible for nuclear security to design more effective systems for deterring and defending against nuclear crimes.

The report combines and builds upon the findings from the first two phases of the project, which were reported in two previous volumes: Attributes of Potential Adversaries of U.S. Nuclear Programs (R-2225-SL, February 1978) and Motivations and Possible Actions of Potential Criminal Adversaries of U.S. Nuclear Programs (R-2554-SL, February 1980).

An aim of this report is to set forth a method for rating the appeal of various nuclear crimes to different adversaries, and thereby provide a tool that nuclear security planners can use in monitoring the threat. For each type of adversary, we began with a set of actions that we had earlier deemed consistent with his motivations and rated each type of action as having either high, medium, or low appeal for that adversary. According to our definitions, high appeal means that the action is consistent with the adversary’s motivations, capabilities, and other attributes. Medium appeal means that the adversary might be willing and able to carry out (or at least attempt) this action, but that it is not consistent with his other attributes, or is not the type of crime he typically commits. Low appeal means that the adversary might be motivated to commit the action but would lack the means to carry it out.

These ratings are not assessments of the probability that a given incident will occur, or that any type of adversary will even choose to attempt a nuclear-related crime. Rather, these ratings reflect our judgments on the relative appeal of various actions for different adversaries if they decided to go into action.

We present appeal ratings for economically motivated criminals (both professional and amateur), political terrorists, antinuclear extremists, and hostile employees. The report also discusses psychotic adversaries and those acting for idiosyncratic reasons, but does not offer appeal ratings for them because of the unusual and often bizarre quality of such people’s mental processes (as when celestial voices order them to punish a sinful world).

Economic motivations might stimulate crimes by amateur criminals and opportunists who work inside nuclear facilities, where their special knowledge and access might allow them to circumvent or disable security systems. Such people could commit a wide range of crimes, possibly including theft of special nuclear materials (SNM).

Professional criminals do not appear to offer much of a threat, at least for now. They probably could carry out a variety of nuclear crimes, but none of them seem to hold great appeal for the professional. Only the theft of nuclear material offers the chance to make a "big score," but three powerful deterrents stand in the way: the physical risks (including possible exposure to radiation), the lack of ready mar-
kets for stolen nuclear material, and the possibility of severe punishment under the Atomic Energy Act, including life imprisonment or death. Should a lucrative black market in nuclear material develop in coming years, the other deterrents might not loom as large.

Threats of sabotage or nuclear threats were rated of high appeal to amateur criminals not working inside the nuclear community. Because we doubt that such adversaries could make good on their threats, however, they do not seem to represent a serious danger; but the potential for disruption and monetary loss from a well-executed hoax remains a concern.

For political terrorist groups, several criminal actions potentially hold high appeal, including sabotage, high-level standoff attack, and armed seizure of a nuclear facility. Terrorists have made such attacks against nuclear facilities in foreign countries, and against nonnuclear targets both in the United States and abroad. Incidents involving nuclear targets would assure terrorists of massive publicity and public alarm, which is their central aim. Terrorists are interested in fomenting terror, not large-scale destruction or bloodshed, which could permanently destroy their hopes of enlisting public sympathy for their cause and undoubtedly would impel outraged governments to launch massive manhunts against them.

At the present time, consequently, the most drastic and feared acts of nuclear terrorism—theft of strategic quantities of SNM and fabrication or detonation of a nuclear device—are rated as holding low appeal for political terrorists, both because of the serious technical challenges and the terrorists’ apparent moral and political aversion to large-scale destruction that has constrained their actions to date. Whether that situation will hold for the future, no one can say. The resources and sponsorship of a patron state could enable a terrorist group to surmount the technical problems; and changes in the political context in which the group operates, or the group’s continued failure to achieve its goals, might erode its self-imposed restraints.

It is possible that antinuclear extremists could also become a threat, although few serious crimes against U.S. nuclear programs have been attributed to them thus far. In Europe, antinuclear extremists have committed many more violent attacks against nuclear programs, primarily bombings, and in France a group recently fired a rocket-propelled grenade at a nuclear reactor. The European experience does not necessarily presage similar developments in the United States, because of the differences in political and social context. The European countries that have experienced the most antinuclear violence have also suffered high levels of overall political terrorism.

Should some extremist elements of the U.S. antinuclear movement decide to step up their protests to include criminal actions in the years ahead, high-appeal actions would include low-level sabotage and interference with the transport of nuclear fuels or wastes. Standoff attacks, sabotage endangering human lives, theft of small quantities of SNM, and mass occupation of a nuclear facility are rated as having only medium appeal because, although antinuclear extremists might be able to carry out such actions, the prospect of alienating current and potential supporters of the antinuclear movement should act as a deterrent. The future course of events will depend upon the outcome of the current debate over tactics
within the antinuclear movement, upon government and industry decisions about nuclear programs, and upon other developments in the political environment.

Hostile employees motivated by personal or labor-related grievances, like economically motivated employees of a criminal bent, represent a special danger to nuclear facilities because of their knowledge and inside access. A variety of crimes might be highly appealing to them, including low-level sabotage, sabotage endangering human lives, theft of small quantities of SNM, and armed seizure or mass occupation of a facility (or a critical area of the facility, such as a reactor control room).

It is also possible for employees to be coerced into cooperating with a criminal scheme by blackmail or threats of violence against themselves or their families. Professional criminals and agents of foreign governments are the adversaries most likely to make such attempts.

Although we did not compile appeal ratings for psychotic adversaries, it seems possible that a functional psychotic working at a nuclear facility, or an employee suffering a sudden psychotic break, would be capable of an armed takeover or sabotage endangering human lives. Individuals acting for idiosyncratic reasons might attempt a variety of schemes, from infiltrating a nuclear facility or tampering with its computer files, to designing and constructing an improvised nuclear device "just to prove it could be done."

The crimes considered in this report vary widely in the seriousness of their potential consequences. Certain relatively minor disruptive actions could be appealing to several types of adversaries, such as nuclear hoaxes, threats of sabotage, conventional bombings, and other forms of low-level sabotage at nuclear facilities. Such actions do not require extraordinary skills or abundant material resources; they have occurred numerous times in the past, and it seems likely that they will continue to occur.

Of perhaps greater concern, however, is the finding that there are several crimes that could have serious consequences for public safety and are of high appeal to one or more categories of adversaries. These are theft of SNM (in small or strategic quantities) by a criminal insider; armed seizure of a nuclear facility by political terrorists or hostile employees; and mass occupation of a nuclear facility by antinuclear extremists or hostile employees.

It is impossible to forecast which potential adversaries, if any, will act, what they will do, or when. Our analysis has achieved more modest objectives: It demonstrates that the combinations of potential adversaries and crimes against nuclear facilities probably exceed those facing any other type of installation, and it should enable security officials to plan their defenses with a clearer sense of what their adversaries might attempt.
ACKNOWLEDGMENTS

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We are also indebted to Mary Shannon for her preparation of the manuscript and to Janet DeLand and Will Harriss for their editorial assistance.
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Chapter 1
INTRODUCTION

This report presents the findings of a Rand project on the potential threat to U.S. nuclear programs and facilities. The project's central task is to analyze the attributes and motivations of potential criminal adversaries who might carry out malevolent actions against U.S. nuclear facilities, and to determine which types of actions would be most attractive to them. Such information may help officials responsible for nuclear security to design more effective systems for deterring and defending against nuclear crimes.

We use the term "nuclear programs and facilities" in its broadest sense, to include weapon fabrication facilities, civilian nuclear energy facilities and facilities in the fuel cycle, nuclear research facilities, facilities that fabricate fuel for naval reactors, and all transport of nuclear material. The term "nuclear crime" refers to malevolent criminal action against a nuclear facility or involving nuclear material or weapons. We exclude legitimate acts of protest from this category. We are most concerned with crimes that may cause serious damage or disruption, and especially with crimes that may directly or indirectly imperil public safety. We include among these crimes attack, seizure, or sabotage of a nuclear facility; threats against nuclear facility personnel or their kidnapping or assassination; theft of special nuclear material (SNM); release of radioactive materials; theft of a nuclear weapon; construction or detonation of an improvised nuclear device; and extortion involving nuclear materials or weapons.

Two previous volumes reported the results of the first two phases of this project. Attributes of Potential Adversaries of U.S. Nuclear Programs (R-2225-SL, February 1978) described the material and operational capabilities likely to be displayed by various categories of potential nuclear adversaries. In other words, it dealt with the how of possible nuclear crime. Motivations and Possible Actions of Potential Criminal Adversaries of U.S. Nuclear Programs (R-2554-SL, February 1980) dealt in turn with why people might attack nuclear facilities. Besides examining motivations, it offered judgments on the types of actions that would be consistent with the motivations of each type of adversary. It did not, however, consider whether these adversaries would have the capabilities to carry out any crimes they might contemplate.

This report integrates and builds upon its two predecessors. It combines the earlier independent analyses of adversary attributes and motivations to determine the relative appeal of specific actions to various adversaries. Before explaining

1 In the United States, responsibility for security of such facilities is divided between the Nuclear Regulatory Commission, which establishes security standards for licensed nuclear facilities (nuclear power reactors and fuel cycle facilities), and the Department of Energy, which is responsible for the security of government nuclear research facilities, nuclear weapons fabrication programs, and special nuclear material (SNM) wherever it may be.

2 The core research effort described here has been supplemented by in-depth analyses of related topics, such as the mindset of political terrorists. See, for example, Konrad Kellen, Terrorists—What Are They Like? How Some Terrorists Describe Their World and Actions, The Rand Corporation, N-1300-SL, November 1979.
exactly how this was done, we will very briefly review the research approach and several major findings of the two earlier studies.

REVIEW OF PHASE I: ATTRIBUTES

To understand potential criminal adversaries of nuclear programs, we have both examined data on past nuclear-related incidents in the United States and abroad and have also used what we term the analog approach. Since nuclear-related crimes have been few to date, we decided to expand our data base and analyze nonnuclear crimes that are analogous to possible future nuclear crimes in their operational requirements or motivations—hence, the analog approach.

Phase I of the research described such attributes of potential adversaries as their numbers, weapons, technical skill, and level of dedication. The study relied on analysis of past nuclear-related crimes as well as five types of analog incidents: task force crimes (sophisticated burglaries and armed robberies), terrorist assaults, industrial sabotage, symbolic bombings, and commando raids. Each type of analog action was selected because it resembled possible future nuclear crimes in some important way. For example, task force crimes have often necessitated penetration of sophisticated alarm systems and physical barriers akin to elements of the security systems that protect nuclear facilities. Industrial sabotage often involves inside assistance, another possible component of various nuclear crimes. Wartime commando raids were added to the four peacetime analog categories because none of these four provided cases of targets that were defended as heavily as some nuclear facilities.

For each type of analog incident, we constructed a composite summary of the adversary attributes and characteristics displayed in a "typical" case. For example, a representative terrorist assault involved three to six people with handguns, automatic weapons, and high explosives; a medium level of technical skills; a high level of dedication (reflected in willingness to risk capture or death); no inside assistance; and medium to high degrees of planning, ingenuity, and imagination. Table A.1 in the appendix presents composite summaries for all the analog categories.

Proceeding from our analysis of these categories, we constructed profiles of two composite adversaries that could serve as reference points for designers of nuclear security systems (see appendix Table A.2). The first, the composite "typical" adversary, represents the capabilities commonly displayed in the several hundred ordinary and political crimes studied. These capabilities being commonplace, it is essential that nuclear facilities at least be prepared to defend against adversaries who possess them.

The second composite adversary profile is an artificial construct representing the higher levels of resources and capabilities seen in the data base. Adversaries displaying high-level attributes across all categories were not seen in the peacetime incidents we studied. If the defense systems at nuclear facilities were designed to force an adversary to assemble such high levels of skills and resources in all areas, many potential adversaries might, in effect, be priced out of the market.

The first phase of the research concluded that physical resources—weapons, tools, transportation—did not seem to represent serious constraints to adversaries.
Most could and did assemble what they needed to assault their targets. The research also reached the important conclusion that the critical constraints seem to lie in the less tangible realm of human capabilities, such as imagination and ingenuity, criminal skills, technical knowledge, willingness to risk capture or death, and the accurate intelligence or privileged access often provided by insider confederates.

**REVIEW OF PHASE II: MOTIVATIONS**

Phase II of the research effort analyzed the motivations that might stimulate potential adversaries to attack nuclear facilities. We hypothesized that such motivations could be roughly divided into three categories: economic, ideological, and personal. An individual adversary could combine two or three types of motivation, of course, or a group of adversaries could include individuals each spurred by a single type; nonetheless, for most adversaries, we would expect one of these three types of motivation to predominate.

The earlier report (R-2554-SL) described eight classes of potential adversaries, reflecting the three dominant types of motivation:³

**Economic**

- Professional criminals
- Occasional or novice criminals or opportunists

**Ideological**

- Political terrorists
- Antinuclear extremists
- Philosophical or religious extremists

**Personal**

- Psychotics
- Individuals acting for idiosyncratic reasons
- Hostile employees

We described the probable motivations of each type of adversary and then determined which types of actions would be consistent with those motivations. We did not attempt, however, to determine the adversary's capability to carry out a given action. Appendix Table A.3 is a matrix of potential adversaries and possible actions that summarizes the findings of Phase II of the research. Perhaps the salient conclusion was that nuclear defenders must anticipate a surprisingly wide range of threats from an equally wide array of potential adversaries, whose possible actions could run the gamut from adolescent pranks to mass destruction. Appendix Table A.3 also shows which types of actions have already been committed by a given type of adversary, either in the United States or abroad, demonstrating

³ The study did not examine in detail the potential for nuclear crimes by agents of foreign governments in the United States, but this additional category of adversary is included in the summary motivations matrix, Table A.3 in the appendix.
that the presumed range of potential dangers to nuclear programs is by no means entirely hypothetical. Moreover, the data showed that nuclear-related criminal actions have been escalating in the past few years, in terms of both numbers and seriousness.

**ANALYTIC APPROACH FOR PHASE III**

The purpose of Phase III was to determine the relative appeal of various actions to each type of potential adversary—to distinguish those nuclear crimes that would hold more attraction from those that would hold less. We reasoned that, for most adversaries, the appeal of a crime is a function not merely of motivation but also of self-perceived capability to carry it off. Actions that seem to an adversary to be beyond his capabilities and resources—human and otherwise—would hold little appeal and therefore would probably not be attempted.

We expect that most adversaries' self-perceived capabilities are essentially realistic. Consequently, for the sake of simplicity, we drop the modifier "self-perceived" in the remainder of the report and refer merely to "capabilities." Accordingly, when we say that an adversary "has the capabilities" for a certain crime, we mean that he could probably make a credible attempt to carry it off. Whether or not he would succeed, of course, we cannot predict. Adversaries may overestimate their capabilities or underestimate what the task demands.

This reasoning may not hold for psychotics, who are incapable of rationally assessing their capabilities. Chapter 6 discusses the difficulties of rating the relative appeal of various actions to psychotics.

As our analysis proceeded, we recognized that we should take further attributes of the adversary into account, such as his preferred modus operandi and his willingness to take risks. We therefore had to consider three types of factors: motivations, capabilities, and these other attributes.

For each type of adversary, we began with that set of actions from Phase II that had been judged consistent with his motivations. We then rated each type of action as being of either high, medium, or low appeal for that adversary. High appeal means that the action is consistent with the adversary's motivations, capabilities, and other attributes. Medium appeal means that, in our judgment, this adversary would have the motivations and capabilities to carry out (or at least to attempt) this action, but that such an action is not consistent with his other attributes, or is not the type of crime he typically commits. Low appeal means that the adversary, though motivated to commit a given action, would be constrained from doing so by lack of capabilities. Table 1 depicts the criteria we used in assigning our ratings.

These ratings are not assessments of the probability that a given incident will occur. They are not based on intelligence reports or other analyses of specific adversary groups. They do not predict the likelihood that any such group (or individual) will choose to engage in nuclear-related crimes at all. Rather, these ratings reflect our judgments as to the relative appeal various actions would hold for different adversaries if they should decide to act against nuclear facilities or programs.
Table 1
Criteria for Rating Relative Appeal of Actions

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Capabilities</th>
<th>Other Attributes</th>
<th>Appeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>+</td>
<td>+</td>
<td>High</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>-</td>
<td>Medium</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
<td>?</td>
<td>Low</td>
</tr>
</tbody>
</table>

NOTE: + = action consistent with adversary; - = action not consistent; ? = where capabilities are lacking, the action's consistency with other attributes has not been determined.

Medium appeal is perhaps the most fluid rating. It suggests that an adversary has the motivations and capabilities to attempt a given action, but that the action does not fit with his other attributes or established modus operandi. Since criminals have been known to change their patterns of action, however, for both internal and environmental reasons (e.g., entry of organized crime into drug trafficking), an action with medium appeal at present could develop higher appeal, and therefore present a greater threat, in the future.

When we are dealing with a generic type of adversary, the range of capabilities among its members may vary enormously. For example, some professional criminals are vastly more proficient than others. A positive judgment about an adversary’s capabilities for a specific crime means that our analysis of past actions (either nuclear-related or analogous nonnuclear crimes) by such adversaries revealed the kind of capabilities assumed necessary for that crime. Thus, it is plausible to infer that at least some adversaries of this type could muster the capabilities to attempt nuclear-related crime. In doubtful cases, we thought it safer to err on the side of overestimating rather than underestimating the adversary’s capabilities. We leaned toward conceding him those capabilities if he had the motivation and other relevant attributes, unless we were confident that he would reject the crime as beyond his capabilities.

An adversary’s capabilities obviously depend in part on the defensive capacity of the target facility. Since we have not performed analyses of the defense systems at nuclear facilities, we do not know precisely what capabilities would be required to succeed in a particular nuclear-related criminal mission. Moreover, at this point, we are treating all U.S. nuclear facilities as potential targets, rather than differentiating among types of facilities or considering specific facilities within each type. Because those defensive capacities vary, the capabilities required to execute a specific type of crime, such as theft or sabotage, would also vary depending on the target selected. Officials at a specific facility may be aware of factors that warrant adjustment of our appeal ratings to fit their case. An aim of this report is to demonstrate a process for rating the appeal of various nuclear crimes to different adversaries, and thereby provide a tool to assist nuclear security planners in their continuous monitoring of a dynamic threat.
DEFINITIONS OF ACTIONS

Below we define some of the crimes considered in this report. Crimes not defined here are used in their common parlance meanings.

**Theft.** We distinguish three categories of theft:

1. Theft of non-SNM; e.g., equipment, conventional explosives, unenriched uranium.
2. Theft of SNM in quantities too small to fabricate a nuclear weapon.
3. Theft of SNM in strategic quantities; e.g., a nuclear weapon, a nuclear weapon component, or enough enriched nuclear material to fabricate a weapon.

**Sabotage.** We distinguish three levels of sabotage:

1. Low-level sabotage: vandalism or action intended to temporarily disrupt operations or disable a facility, but not intended to endanger human lives or cause radioactive release.
2. Sabotage endangering human lives, but not intended to produce radioactive release.
3. High-level sabotage: intended to produce radioactive release and thereby endanger public safety.

**Standoff Attack.** An attack launched from outside the facility that does not involve physically entering the facility grounds. We distinguish two levels:

1. Low-level: e.g., pistol or rifle fire directed against nuclear facilities or transport vehicles.
2. High-level: e.g., use of crew-served weapons (mortars or rocket-propelled grenade launchers), aerial bombing, or use of remotely piloted aircraft or vehicles carrying explosives.

**Armed Seizure of a Nuclear Facility.** A group may use armed force in assaulting and attempting to occupy a nuclear facility.

**Mass Occupation of a Nuclear Facility.** A crowd may attempt to occupy a nuclear facility through force of numbers rather than arms.

**Fake Diversion.** Adversaries may create a false appearance that nuclear material is missing by manipulating records, altering the identity of containers, or concealing material within a facility (for extortion, coercion, or disruption).

**Attempted Sale of Nuclear Material.** Adversaries may attempt the illegal sale of either genuine or bogus nuclear material. A bogus deal is referred to as a "scam."

**Disclosure of Classified Information.** People may make unauthorized disclosure of classified information for financial gain, to aid adversaries, or to influence the public debate.

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4 These definitions differ from those used in R-2554-SL. These classifications are based on the *intent* of the crime. Of course, an adversary might not intend to cause radioactive release but do so accidentally or intend to do so but fail.
Misuse of Facility. People may make unauthorized use of a nuclear facility (e.g., to process stolen material).

Kidnapping or Violence Against Persons. Adversaries may kidnap or commit violence against nuclear industry officials or employees (or families) for coercion or intimidation.

ORGANIZATION OF THE REPORT

Each of the next four chapters discusses the appeal of various nuclear crimes to a different set of potential adversaries. Chapter 2 considers professional criminals, occasional criminals, or opportunists who might engage in nuclear crime for economic gain. Chapters 3 and 4 deal, respectively, with political terrorists and antinuclear extremists, two examples of ideologically motivated adversaries. Chapter 5 examines a special category of potential adversaries, employees of nuclear industries motivated by job-related grievances or labor-management strife. Chapter 6 briefly discusses two categories of adversaries for whom we have not rated the appeal of various crimes: psychotics and individuals acting for idiosyncratic reasons. Chapter 7 presents the conclusions of the study. It also contains summary matrices reflecting the relative appeal of nuclear crimes to various types of adversaries.

5 Employee adversaries motivated by economic gain are discussed in Chap. 2. Chapter 6 considers employees who might commit hostile actions as a result of mental disturbance.
Chapter 2

CRIMINALS AS POTENTIAL ADVERSARIES TO U.S. NUCLEAR PROGRAMS

INTRODUCTION

This chapter examines the potential threat of crimes against nuclear facilities by persons or groups motivated by economic gain. The next two sections review materials contained in the earlier reports: the first describes economically motivated nuclear crimes that have already occurred in the United States and abroad; the second analyzes the incentives and disincentives confronting criminals who might contemplate nuclear crime for profit. Next come the ratings of the appeal of various potential crimes, first for professional criminals, and then for occasional criminals or opportunists, distinguishing between those who are insiders at nuclear facilities and those who are not.

ECONOMICALLY MOTIVATED NUCLEAR CRIMES

The concern with economically motivated nuclear crimes is not new. As long ago as 1967, members of the Ad Hoc Advisory Panel on Safeguarding Special Nuclear Material, the so-called Lumb Panel, recommended:

Safeguards programs should also be designed in recognition of the problem of terrorist or criminal groups clandestinely acquiring nuclear weapons or materials useful therein. Although such illegal groups are more likely to steal finished components or weapons than divert materials from peaceful programs, criminal organizations may be attracted to divert such materials if a black market develops, as it is likely to. It should be recognized that political and social restraints would not influence ... criminal groups. ... As a world commercial market, and perhaps a black market, developed for special nuclear materials, they may develop financial incentives (to criminal elements, or not responsible corporate organizations) working contrary to the objectives of safeguards programs. ... Every effort should be made to insure timely notification of the opening of black markets in the world for special nuclear materials. It is not clear that such markets exist today, although the panel understands that a “fence” was involved in the recent theft of fuel elements (containing natural uranium) from the Bradwell Reactor in England.¹

The incident referred to by the Lumb Panel was the theft, in November 1966, of twenty natural uranium fuel elements from the Bradwell nuclear power station in Great Britain, carried out by two men (one an employee at the plant) who offered the rods for money and were later arrested; the fuel elements were recovered.

Since the Lumb Panel issued its report, a number of economically motivated nuclear crimes have occurred, some of which may foreshadow future criminal

schemes. In April 1974, a uranium-smuggling operation in India was exposed. Complete details of the incident are not available, but it appears that natural uranium was being removed from a plant in Bihar, smuggled to Nepal, and then secretly shipped to Hong Kong, where Chinese or Pakistani agents reportedly took delivery. It is suspected that as much as $2.5 million worth of uranium may have been involved. The operation was uncovered when five participants were arrested in India and 3.5 kilograms of uranium were recovered.

In the United States, in February 1979, FBI officials arrested two Albuquerque men near El Paso and seized 5000 pounds of semi-refined uranium ore, or "yellowcake," believed to have been stolen from a New Mexico uranium mill. This seizure followed a confiscation three months earlier of one ton of yellowcake from a self-service storage shed in Albuquerque.

We know of no nuclear black market that has developed in the intervening 13 years since the Lumb Report; however, in the past few years there have been several reports of attempted illicit international sales of uranium that subsequently appeared to be cases of attempted fraud. One case occurred in March 1978, when the FBI reported it was investigating an attempted sale of 239 pounds of black market uranium—supposedly sufficiently enriched for use in weapons—by a European businessman to a U.S. corporation. Later reports indicated that the mineral was a form of depleted uranium that had little commercial value and no potential use in an atomic weapon.

Should traffic in low-grade uranium develop, illicit possessors would also need to find a way of processing it. An incident in 1971 is worth noting in this regard. The president of Hydro-Jet Services, Inc., in Texas, reported that he had been offered a bribe of $50,000 a month for the use of his company's equipment in processing half a million pounds of stolen yellowcake. An investigation failed to disclose the theft of any yellowcake or any clue to its existence, and no inventory discrepancies were revealed.

Criminals could also benefit from the theft of nuclear material by extorting money from the government or ransoming it to the company from which it was stolen. Several dozen hoax extortions involving monetary demands and claimed possession of nuclear material or devices have occurred in the United States in the last decade. One such extortion threat, in January 1979, was genuine: A subcontractor employee at the General Electric Fuel Processing Plant in Wilmington, North Carolina, stole two five-gallon drums containing some 150 pounds of uranium oxide and demanded $100,000 from the company for their return. He was apprehended by the FBI before the deadline for complying with his demands. In this case, a dual motive was present. In addition to economic gain, the man seems to have been seeking revenge for an early termination from his job at the plant.

Finally, there was the rather bizarre nuclear-related theft plot that was exposed in the fall of 1978, when the FBI arrested two men for conspiring to steal a nuclear submarine and sell it to the Mafia for $150 million.\(^2\) Government prosecutors subsequently concluded that the men had intended to do no more than abscond with the $300,000 in front money to be put up by the buyers.

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\(^2\) Lasslo K. Domjan, "Submariners Hatched a Plot that Just Won't Float," Los Angeles Times, October 14, 1979, Sec. VIII, pp. 4-6.
NUCLEAR CRIME FOR PROFIT: ATTRACTIONS AND DETERRENTS

A number of factors may induce criminals, professional or amateur, to try to steal nuclear commodities. There is the potentially large monetary payoff—through sale, ransom, or extortion—possibly the biggest of "big scores." There is the possibility of bargaining for immunity from prosecution. Such a grandiose theft would also hold the psychological allure of excitement and challenge, along with the likelihood of fame in criminal circles. Given the antisocial orientation of professional criminals, they might derive special pleasure from possession of nuclear materials or weapons—the ultimate symbols of power—that could put society and particularly government officials at their mercy. In short, a successful theft of nuclear materials or devices could entail the entire spectrum of motives that drive criminal activities.

At the same time, several countervailing factors should act as deterrents against nuclear crime. Tight security at nuclear facilities means that, unless criminals were to use deception or have insider assistance, stealing nuclear materials or weapons would almost certainly subject them to the risk of armed confrontation. Those who commit high-value thefts typically minimize the physical risks, avoiding shoot-outs with security guards or police whenever possible. Besides the difficulty of penetrating a nuclear facility, the career criminal may fear exposure to radiation (for good reason), and may also harbor less realistic fears absorbed from the mass media. These fears may make nuclear theft seem too risky. Moreover, law enforcement efforts to apprehend nuclear criminals would be unusually intense, and the Atomic Energy Act provides for stiff punishment, including death or life imprisonment, for certain crimes in the nuclear domain.

Another obstacle might be the mutual lack of contact between criminals and illicit buyers of stolen nuclear commodities. For either side to enter negotiations with the other would entail suspicion and risk.

Furthermore, the professional criminal involved in nuclear theft may be "fingered" by informers—perhaps even in advance of the crime. Ordinarily, the career criminal counts on his friends and acquaintances to support and protect him, but he may find himself abandoned and betrayed by such associates if he commits a nuclear crime that threatens to bring too much "heat" on the criminal world in general. The Atomic Weapons and Special Nuclear Materials Rewards Act provides for a $500,000 reward for information concerning the illegal acquisition, manufacture, importing, or exporting of SNM or an atomic weapon.

In nuclear theft, then, the professional criminal would be operating with more uncertainties than usual, and the more doubts there are, the less likely he is to go through with it. Most criminals, although they recognize that they might be caught "someday," go into each crime fully expecting not to be caught. Cause and effect are a bit difficult to separate here. If he has planned carefully, understood and dealt with the risks, and eliminated the unknowns, the criminal is correct that he is not very likely to be caught. If he foresees too many uncertainties, however, as he might in the case of a nuclear theft, he might decide to abandon the attempt.

Still another unknown applies to nuclear theft. The "ordinary" criminal knows that even if caught for an "ordinary" crime, he has a good chance of going scot-free or receiving a light sentence through plea-bargaining. He has no such assurance
in a case of nuclear theft. The prosecution would involve federal agencies, and criminals do not like to tangle with "the feds." There are few precedents to consult about prosecution and punishment. While the average career criminal may vary the types of his crimes through the years, they are usually roughly similar and he has a fairly good knowledge of the penalties. The "transfer of learning" employed in the usual variations is not likely to obtain in the nuclear area, and this uncertainty might itself be a dissuasive factor.

THE APPEAL OF NUCLEAR-RELATED CRIMES TO PROFESSIONAL CRIMINALS

By "professional criminal," we mean a person whose main source of livelihood is criminal activity. This research focuses on those who carry out high-value crimes. This group may include a spectrum of types, ranging from "organized crime," the Mafia, with national and international connections; through sophisticated thieves who operate independently or in small groups not linked to organized crime; to small-time criminals who, like the perpetrators of the Brinks robbery, occasionally attempt a "big score."

Although their profiles therefore may vary, analysis of some 120 high-value crimes yields a sense of the attributes professional criminals bring to their jobs. The high-value crimes studied entailed extensive and careful planning. They were often conducted by groups of criminals (sometimes as many as 20) who nonetheless maintained secrecy. They were well armed and well equipped, often recruited for their specialized technical skills. Some specialists traveled great distances to work on a particular job. These criminals tried to minimize physical risks and violence. Though they sometimes came to their targets heavily armed and used a show of force to coerce compliance with their demands, they rarely became involved in shoot-outs with authorities.

Over 30 percent of the high-value nonnuclear crimes in our sample involved insiders, some of whom acted on their own, but most of whom were recruited by outside, professional criminals. Thus, we have reason to believe that employees in nuclear facilities could also be enlisted by outsiders to assist in crimes, persuaded either through bribery or coercion. Professional criminals with insider assistance would clearly be in a better position to carry out crimes than those without it.

It is generally assumed that professional criminals, because of prior criminal records, could not themselves obtain positions within nuclear programs. However, the two nuclear industry employees who stole yellowcake in New Mexico had prior criminal records at the time they were hired. Furthermore, a truly successful professional criminal may have no criminal record, or may have a record of arrests but no convictions. Arrest information might not be available in the clearance process. Alternatively, a professional criminal might be hired under an alias. In sum, it is conceivable that professional criminals could become insiders at nuclear facilities.

Based on our understanding of the way professional criminals work, we draw inferences about their potential interest and capabilities in the domain of nuclear crime. Table 2 shows the appeal ratings we have assigned to the various crimes that professional criminals might consider. Except where noted otherwise, these ratings assume that the professionals are operating without the assistance of insiders.
Table 2
The Appeal of Nuclear-Related Crimes to Professional Criminals

<table>
<thead>
<tr>
<th>High Appeal</th>
<th>Medium Appeal</th>
<th>Low Appeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Threaten or carry out sabotage in connection with extortion</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Theft of non-SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theft of small quantities of SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Theft of strategic quantities of SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threaten or engage in kidnapping or violence in connection with extortion or coercion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuclear threats in connection with extortion or coercion</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sale or attempted sale of nuclear material</td>
<td></td>
</tr>
</tbody>
</table>

High-Appeal Crimes: None

The existence of other types of crime that are lucrative, less risky, and more reliable leads us to conclude that, to the professional criminal, no nuclear crime holds high appeal at present.

Medium-Appeal Crimes

1. Threaten or engage in sabotage in connection with extortion. This was rated medium rather than high appeal because crime in the nuclear domain is terra incognita for criminals, and such crimes would be likely to result in great pressure from law enforcement agencies. Also, while there are protection rackets at the lower level, we have not seen any meaningful analogs in the form of large-scale extortion against energy installations by professional criminals. Several caveats are in order, however. First, extortion is a notoriously underreported crime. There may be a great deal of extortion against energy companies and energy facilities by professional criminals that has not surfaced simply because it went unreported. The second caveat is that we do know of some cases where political terrorists have run “protection operations” against large facilities; professional criminals might do likewise. Examples of such operations include reported Viet Cong extortion operations against Shell Oil and Michelin Rubber plantations in Vietnam, and acts carried out by the Basque Separatists in Northern Spain. Finally, incidents of extraordinary extortion have increased recently in America, as witness the bombing of Harvey’s Casino in Stateline, Nevada, and the actions directed against a refinery in Edmonton, Canada.

2. Theft of non-SNM. While the theft of non-SNM, e.g., equipment, explosives, unenriched uranium, would be the easiest category of theft to accomplish, it
is doubtful that the payoffs would warrant the investment and risk to professional criminals of entering the nuclear domain. Perhaps just as important, yellowcake or low-enriched uranium might be difficult to sell within the nuclear industry and would also have limited marketability outside the nuclear industry. In short, the lack of a ready market might deter the would-be thief.

3. **Theft of small quantities of SNM.** This is theft of SNM in quantities too small to fabricate a nuclear weapon. We are unaware of a market for sub-strategic quantities of SNM. Criminals would incur the same risks here as in stealing strategic amounts of SNM, with smaller potential payoff.

4. **Theft of strategic quantities of SNM.** SNM in strategic quantities (e.g., a nuclear weapon, a nuclear weapon component, or enriched nuclear material sufficient to fabricate a weapon), once stolen, could be sold or even ransomed back to its original owner. Alternatively, a theft might be commissioned. At present, we know of no ready marketplace for stolen SNM. An additional important deterrent to this type of crime is that it would likely confront the thieves with very heavily defended targets. This might be less true for SNM in transit, as opposed to that stored in stationary facilities, but even the security of the truck convoy used to transport large quantities of SNM would pose substantial physical risks for would-be thieves.

Nonetheless, because of the large potential payoff, this might be the most attractive of all nuclear crimes for true professional criminals. To commit this type of crime, we would expect them to try to minimize the risks through the use of insiders, who might be bribed or coerced; to be willing to travel to a target that was judged to be the most vulnerable facility; to plan carefully; and to try to minimize the possibility of armed confrontation.

There have been press reports in recent years that Libyan leader Moammar Qaddafi has expressed interest in acquiring a stolen nuclear weapon. If professional criminals were commissioned by a foreign government to conduct such a theft, they might have access to greater technical and logistical resources than those normally at their disposal, as well as provisions for refuge after the crime had been committed. The payoff would undoubtedly be sizable. Such circumstances could balance the risks sufficiently to move theft of strategic quantities of SNM into the high-appeal category.

5. **Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion.** We cannot see the utility of such an operation to professional criminals unless it were in support of a larger operation, for example, an extortionist threat. Otherwise, the nuclear connection of any individual threatened or kidnapped would be likely to be incidental. In other words, professional criminals might go after a nuclear executive, not because of his involvement in nuclear programs but because he commanded large resources.

6. **Nuclear threats in connection with extortion or coercion.** Professional criminals certainly have the capabilities to mount nuclear hoax threats (i.e., without the capacity to carry out the threat), but acquiring the nuclear resources for a genuine threat would pose many obstacles. Moreover, making such a threat, whether genuine or hoax, would bring intense attention from federal law enforcement, something professional criminals try to avoid. At the same time, we note that extraordinary extortion cases, such as the 1980 bombing at Harvey's Casino at Stateline, Nevada, have been on the increase of late.
7. *Sale or attempted sale of nuclear material.* Here, professional criminals would be acting as intermediaries—"fences"—for thieves who have acquired nuclear material or insiders seeking to divert it for a profit. Organized crime might conceivably act as an intermediary in selling SNM. On the other hand, the ordinary professional criminal, as distinguished from organized crime, would likely be baffled by an offer to purchase—or act as a "fence" for—nuclear material, since it is not something ordinarily traded.

**Low-Appeal Crimes: None**

In sum, none of the actions postulated in our earlier report were eliminated on the basis of capabilities. It is likely that professional criminals possess or could acquire the necessary capabilities to attempt, though not necessarily bring off, the actions described above. At the same time, there are a number of disincentives to deter professional criminals from entering the nuclear domain. Therefore, all of the actions were rated as holding medium appeal.

**THE APPEAL OF NUCLEAR-RELATED CRIMES TO OCCASIONAL CRIMINALS OR OPPORTUNISTS: OUTSIDERS**

We distinguish between occasional criminals or opportunists who are *insiders* at nuclear facilities and those who are *outsiders*, because their capabilities would be quite different. Table 3 shows the appeal ratings for *outsiders*.

**High-Appeal Crimes**

1. *Threaten sabotage in connection with extortion.* Threatening sabotage as part of an extortion scheme warrants a rating of high appeal, since anyone can threaten and since extortion is a common amateur crime. We can point to many examples outside of the nuclear domain, such as threats made to bomb energy facilities or threats to poison food at supermarkets unless the extortionist is paid a large sum of money. Outsiders are unlikely, however, to have the capability to accomplish the threatened sabotage.

2. *Nuclear threats in connection with extortion.* Among the numerous nuclear threats to date, some appear to have been issued by amateur criminals hoping to

<table>
<thead>
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<th>Table 3</th>
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<tr>
<td>The Appeal of Nuclear-Related Crimes to Occasional Criminals or Opportunists: Outsiders</td>
</tr>
<tr>
<td>High Appeal</td>
</tr>
<tr>
<td>Threats of sabotage in connection with extortion</td>
</tr>
<tr>
<td>Nuclear threats in connection with extortion</td>
</tr>
<tr>
<td>Threats against persons (in connection with thefts)</td>
</tr>
</tbody>
</table>
extort money; thus, this crime seems to hold high appeal. Again, however, future nuclear threats from amateur criminal outsiders are likely to be hoaxes, as they have been in the past, because of the difficulty of acquiring the nuclear capability to make good on such a threat.

Medium-Appeal Crimes

1. Theft of non-SNM. Low-level theft is an extremely common crime, often carried out by amateur criminals.

2. Theft of small quantities of SNM. An outsider opportunist would not normally have access to SNM, though this would vary with the level of security at a given facility. Under some circumstances, it is conceivable that an outsider might come across some nuclear material, grab it, and run.

3. Threats against persons in nuclear programs. This does not fall within the normal domain of the novice or amateur outside criminal, but the capability cannot be ruled out. Persons connected with nuclear programs might be threatened by such criminals to gain their cooperation in some nuclear-related criminal scheme.

Low-Appeal Crimes

1. Theft of strategic quantities of SNM. Occasional or opportunist criminals would not possess the capabilities to accomplish this.

2. Theft of information. Lacking the insider’s access to information, the outsider occasional criminal or opportunist would be unable to steal sensitive or classified information.

Note that we have not rated fake diversion, disclosure of classified information, and misuse of a facility. Though they appeared in our earlier matrix as consistent with the motivations of occasional criminals or opportunists, all are crimes that we associate with insiders. Their appeal will therefore be rated in the next section on insiders.

THE APPEAL OF NUCLEAR-RELATED CRIMES TO OCCASIONAL CRIMINALS OR OPPORTUNISTS: INSIDERS

Table 4 rates the appeal of various crimes to occasional criminals or opportunists operating as insiders at nuclear facilities. By insiders, we mean people with legitimate and regular access to the facility, not those who enter the facility by stealth, force, or deception to commit a crime.

High-Appeal Crimes

1. Threatened or actual sabotage, theft of non-SNM, and theft of small quantities of SNM. These might all be high-appeal crimes. Theft of strategic quantities of SNM might also have high appeal and be feasible, though difficult, for several employees who have access to SNM and collaborate. (Such crimes could be carried

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3 An outsider who managed to penetrate a facility's computer system conceivably could alter records to fake a diversion as part of an extortion scheme. The possibility seems remote however.
out more easily by high-level employees, although it is unlikely that even they could manage to steal a nuclear weapon.)

2. **Theft of information.** Industrial espionage is an extremely common crime by insiders.

3. **Misuse of facility.** Insiders involved in illegal trafficking in nuclear material might use the facility without authorization to process such material.

4. **Faking a diversion.** There are a number of precedents in other industries for crimes involving the manipulation of computer records.

5. **Disclosure of classified information** and **nuclear threats** could also have high appeal.

Note that the theft of SNM, in small or strategic quantities, is rated as being of higher appeal to the amateur insider criminal than it is to professional criminals operating as outsiders. Not only are insiders more aware of the vulnerabilities in security systems and therefore better able to exploit them, but they also may be in a better position than professional criminals to know how to go about marketing stolen nuclear material.

In sum, all of the crimes that fit the motivations of insiders were rated as having potentially high appeal, because we believe that some insider or insiders would have the capabilities to commit any of these actions and, if of criminal bent, might be motivated to do so. Moreover, crimes like those listed above are commonly committed by insiders in nonnuclear industries. Those crimes that could be carried out covertly, and that would not require the perpetrator(s) to confront guards or other security barriers, would seem to hold the most potential appeal to insiders. **Because of their access to and knowledge of the facility and its security systems, insiders appear to be the most potentially dangerous adversaries to nuclear programs.**

**CONCLUSIONS**

The preceding analysis suggests that, insofar as economically motivated criminal adversaries are concerned, the primary threat to nuclear programs is posed by
those working inside the nuclear community. While professional criminals were
deemed to have the capabilities to carry out a variety of nuclear crimes, no crime
in the nuclear domain seems at this point to hold great appeal for the professional.
This assessment is based in part on the physical risk-taking required to carry out
nuclear theft, and in part on the lack of ready markets for stolen nuclear material.
Should a lucrative black market in nuclear material develop in coming years, one
important deterrent would disappear and nuclear crime could become more appealing
to professional criminals.

The only crimes rated of high appeal to outsiders were threats of sabotage or
nuclear threats to the nonprofessional outsider. Since we doubt that such adversaries
have the capabilities to inflict much damage on nuclear facilities, they do not seem
to represent a serious actual threat. However, the potential for disruption and
monetary loss from a well-executed hoax threat remains a concern.
Chapter 3

POLITICAL TERRORISTS AS POTENTIAL ADVERSARIES
TO U.S. NUCLEAR PROGRAMS

A variety of motivations might cause political terrorists to attempt nuclear
crimes. Leftist radicals view nuclear programs as symbols of a corrupt, militarist,
capitalist state; hence, they may engage in violent actions against nuclear targets
as a way to rally opponents of civilian or military nuclear programs to their cause.
European terrorist groups clearly have identified the antinuclear movement as a
source of possible supporters and have conducted actions calculated to appeal to the
more extreme members of that movement. In Spain and France, respectively, Basque
and Breton separatist groups have attacked nuclear power plants; in West Germany,
members of the Revolutionary Cells have attacked persons charged with maintaining
the security of nuclear facilities just after violent confrontations between antinu-
clear demonstrators and police; in Italy, a Red Brigades document reportedly urged
attacks on nuclear power plants to exploit antinuclear sentiments in the country.

Thus, one type of terrorist action might include threats against or sabotage of
civilian nuclear facilities under construction or in operation; threats or actions
against executives or security officials at nuclear facilities, particularly where there
may have been violent confrontations between antinuclear demonstrators and police
or security personnel; operations on behalf of persons jailed for antinuclear activi-
ties; and armed occupations, thefts, or other actions calculated to demonstrate that
nuclear programs are exposed to danger, or that security and safety measures are
inadequate, and thereby to undermine public confidence in the nuclear industry and
the government. The common intent of these actions would be to make a political
statement about nuclear-related issues.

In a second type of action, terrorists might use a nuclear scheme for its coercive
power, hoping to stir up widespread alarm that could increase their leverage in
making demands on the government. Nuclear extortion could involve political de-
mands (e.g., specific changes in foreign policy, release of all "political prisoners") or
demands for vast amounts of money to finance the terrorists’ operations. Coercive
actions might involve theft of a nuclear weapon or SNM for threatened use in an
explosive or dispersal device, or the fabrication of a credible hoax threat.

The most concerted terrorist campaign against nuclear programs has been
waged by the Basque separatist group Euzkadi Ta Azkatasuna (Basque Homeland
and Liberty), or ETA, against the reactors under construction at Lemoniz and other
nuclear facilities in Spain. There have been numerous bombings, both at the nuclear
plants and at companies that build them or supply equipment to them. ETA’s tactics
have also included threats of execution against the president of Iberduero, the
Spanish utility company constructing Lemoniz, kidnappings, and most recently, a
murder. In June 1979 they kidnapped and held for four days a Ministry of Industry
official involved in the Spanish government’s nuclear program. In February 1981,
ETA kidnapped and killed the chief engineer at Lemoniz when Iberduero refused to
comply with their demands to halt the reactor’s construction.
One of the ETA guerrillas' most ambitious raids to date was a bombing and kidnapping at the Equipos Nucleares (Nuclear Instruments) factory in Maliano, close to the airport in Santander. The factory was repairing a component for a nuclear power plant at Lemoniz. During the night of November 11, 1979, five guerrillas armed with pistols, submachine guns, and a hand grenade used 50 kilos of plastic explosives to blow up one end of the main factory building. The terrorists entered through the main door, rounded up all ten guards on duty, set the charges, and kidnapped the employees, who were later released close to the provincial border. The explosion caused an estimated $6 million in property damage but missed the generator that the guerrillas said was their prime target.

With the possible exception of the bombing of the visitors' center at the Trojan nuclear power plant in Rainier, Oregon, in 1977, credit for which was claimed by the "Environmental Assault Unit" of the New World Liberation Front (NWLF), there appear to have been no actual nuclear-related crimes by political terrorists in the United States.¹ A few threats have been received, but no evidence of preparations to carry them out. For example, on December 31, 1975, the American Broadcasting Company received a letter that purported to be from the Armed Forces for Puerto Rican National Liberation (FALN). It threatened the detonation of 100 bombs (25 of them made with nuclear materials) in New York City on New Year's Eve. No specific demands were made—the bombs were simply to be "protesting for American fairness."

A communique was received by a newspaper in 1980 in Bogotá, Colombia, stating that armed action would be taken in the United States if any military action were taken to end the occupation of the Dominican Embassy in Bogotá, then under terrorist siege. The announcement was jointly issued by the Colombian 19 April Movement (M-19), the Armed Forces for the Liberation of Puerto Rico (PAL) and the Dominican 14 June Movement (M-14). The communique said: "You must remember, U.S. gentlemen, that you have never experienced war in your vitals and that you have many nuclear reactors."

Rating the relative appeal of nuclear crimes to terrorist groups is problematic for a number of reasons. First, there is a wide range of capability among terrorist groups. Some of these groups could carry out actions requiring resources and technical skills far beyond the reach of other terrorist groups. Also, while recent research on terrorism has increased our understanding of the phenomenon, there is still much we do not know about how terrorists choose their actions and targets.

The high level of dedication often exhibited by political terrorists, that is, their willingness to risk capture or death, suggests that they might not be deterred from attacking nuclear facilities by the armed guards and physical defenses that would be likely to keep away less committed adversaries (e.g., the professional criminal). The potential for capturing headlines through an attack on the nuclear domain, especially as "conventional" kidnappings, hostage seizures, and assassinations become less newsworthy, might appeal to some terrorists. Yet, in contemplating any action that might cause massive casualties, the possibility of alienating supporters and sympathizers (real or imagined) and provoking severe repression would weigh

¹It is not known whether the Trojan bombing was in fact ordered by the NWLF leadership, or whether the so-called Environmental Assault Unit represented a splinter group operating independently or possibly a group unconnected with the NWLF which used the name to attract greater attention to the action and at the same time displace blame.
seriously in the balance. Most of the major terrorist attacks against nuclear facilities to date, even by the Basques, have been against reactors under construction. Comparable attacks against fueled and operating reactors would represent a significant escalation; still, changes in the political context could erode the apparent self-imposed moral and political constraints under which terrorists have operated to date.

Finally, since this report's concern is the potential threat to nuclear facilities and programs in the United States, one might ask whether it is justifiable to extrapolate from the experience of other countries where terrorists have attacked nuclear targets. After all, the United States has seen little terrorist violence against nuclear targets thus far; in fact, it has seen little political terrorism at all, although U.S. personnel and facilities have frequently been attacked by terrorists abroad.

For several reasons, nonetheless, we have used our international data base to rate the appeal of nuclear crimes to political terrorists. First, one cannot confidently rule out the possibility that domestic terrorist activity in the United States may increase. Should political terrorist groups become more active and decide to target nuclear facilities, their actions might well parallel those observed in Europe. Sophisticated weapons, such as rocket-propelled grenades, are now available to terrorist groups everywhere; consequently, if changes in the U.S. political environment were to spawn more violent domestic terrorist groups, they probably could muster the capabilities for actions such as high-level standoff attacks, should they choose to do so. Moreover, there is the possibility, although remote at present, that one of the better organized foreign terrorist groups might decide to stage a nuclear crime in the United States.

With these considerations in mind, we turn to the appeal ratings of specific nuclear crimes for political terrorists, as presented in Table 5.

Table 5
The Appeal of Nuclear-Related Crimes to Political Terrorists

<table>
<thead>
<tr>
<th>High Appeal</th>
<th>Medium Appeal</th>
<th>Low Appeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-level standoff</td>
<td>High-level sabotage</td>
<td>Theft of strategic quantities of SNM</td>
</tr>
<tr>
<td>Low-level sabotage</td>
<td>with radioactive release</td>
<td>Fabrication or detonation of nuclear device</td>
</tr>
<tr>
<td>Sabotage endangering human lives</td>
<td>Dispersal of nuclear material</td>
<td></td>
</tr>
<tr>
<td>Kidnapping and violence against persons</td>
<td>Theft of non-SNM</td>
<td></td>
</tr>
<tr>
<td>Armed seizure of a facility</td>
<td>Theft of small quantities of SNM</td>
<td></td>
</tr>
<tr>
<td>Nuclear threats</td>
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</tbody>
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THE APPEAL OF NUCLEAR-RELATED CRIMES TO POLITICAL TERRORISTS

High-Appeal Crimes

1. **High-level standoff attack.** Terrorists abroad have used such weapons as rocket-propelled grenades on a number of occasions for high-level standoff attacks, including a January 18, 1982, attack on the breeder reactor being constructed at Creys-Malville, France (see Chap. 4). In 1964, anti-Castro Cubans fired a mortar shell at the United Nations headquarters as Ché Guevara addressed the General Assembly. Such standoff attacks against nuclear facilities in the United States would certainly be feasible.

2. **Low-level sabotage.** Low-level sabotage by political terrorists has been frequent in Europe. Within the United States, the bombing at the Trojan nuclear power plant would qualify as low-level sabotage.

3. **Sabotage endangering human lives.** Terrorists have killed workers while sabotaging a nuclear plant under construction in Spain. Such violence, which stops short of endangering public safety, may hold high appeal to some terrorists.

4. **Kidnapping and violence against persons.** Basque terrorists in Spain kidnapped and killed a nuclear industry official in an effort to halt the construction at Lemoniz and sent death threats to 33 Iberduero technicians for the same purpose. While there is no tradition of political kidnappings in the United States (Patricia Hearst is the notable exception), should U.S. terrorist groups target the nuclear industry at some time in the future, such actions against personnel could appeal to them as being dramatic, feasible, and relatively safe.

5. **Armed seizure of a facility.** Armed seizure, along with the taking of hostages, is rated as having high appeal because terrorists often use human lives as a lever, as they have done repeatedly by hijacking airplanes and seizing nonnuclear facilities. Higher capabilities would undoubtedly be required to seize and hold a nuclear installation than, for example, an embassy, but it may be within the power of some terrorist groups. There is a single precedent in this area. In 1973, members of a leftist urban guerrilla group in Argentina occupied the nuclear power plant under construction at Atucha. They overpowered the guards and stole weapons, but made no demands and did not attempt to enter the reactor area or damage the facility.

6. **Nuclear threats.** Nuclear threats in connection with extortion or coercion are rated as having high appeal. Threats are easy to make, and a terrorist group with an impressive history of violence might exploit its record to lend credibility to a nuclear hoax aimed at extracting political concessions. It would, of course, have to weigh the potential damage to its credibility if the government refused its demands and called its bluff.

Medium-Appeal Crimes

1. **High-level sabotage with radioactive release.** This action is thought to have only medium appeal because of technical difficulties and self-imposed ideological or moral constraints against causing mass casualties. However, it might be within the technical capacity of the most sophisticated terrorist groups.
2. Dispersal of nuclear material. While the technical requirements for dispersal would be less than those for high-level sabotage with radioactive release, similar political and moral constraints would make it of only medium appeal.

3. Theft of non-SNM or small quantities of SNM. These are rated as having medium appeal because although political terrorists do, of course, commit thefts to finance their operations, they probably can find more attractive targets than nuclear facilities for their purpose. Small quantities of SNM might be desired, however, for use in extortion schemes or for limited dispersal.

Low-Appeal Crimes

1. Theft of strategic quantities of SNM. The theft of SNM in strategic quantities, or of a nuclear weapon, may be the dream of some political terrorists because of the potential leverage it would accord them. But stealing a weapon or sufficient SNM to build one would require attacking very heavily defended targets and would present other serious technical problems. At the present time, such an action would so tax the capabilities of most terrorist groups as to be of low appeal to them. If, however, they had the resources and support of a patron state at their disposal, such a theft might hold greater appeal.

2. Fabrication or detonation of a nuclear device. Technical obstacles, as well as the political and moral constraints described above, limit the appeal of such actions for terrorist groups in the current political environment.

CONCLUSIONS

In sum, a variety of criminal actions, including sabotage, high-level standoff attack, and armed seizure of a nuclear facility, potentially hold high appeal for political terrorist groups. Terrorists have perpetrated such attacks both in the United States and abroad, though not in every case against nuclear targets. Incidents involving nuclear targets would assure terrorists of massive publicity and public alarm, important considerations in their planning of actions.

At the present time, however, the most drastic and feared acts of nuclear terrorism—stealth of strategic quantities of SNM and fabrication or detonation of a nuclear device—are rated as having low appeal, both because of the serious technical challenges involved and the apparent moral and political constraints against mass destruction that have limited terrorist actions to date. The resources and support of a patron state could, however, allow a terrorist group to surmount the technical problems; and changes in the political context, or desperation within a group over continued failure to achieve its goals, could potentially erode the self-imposed restraints.
Chapter 4

THE POTENTIAL FOR CRIMINAL ACTIONS BY ANTINUCLEAR EXTREMISTS

THE ATTRIBUTES OF ANTINUCLEAR EXTREMISTS

When we speak of antinuclear extremists as potential criminal adversaries of U.S. nuclear programs, we mean individuals or groups so committed in their opposition to nuclear programs that they would be willing to undertake criminal actions to further their cause. Ascribing attributes to this class of potential adversaries necessitates some speculation, as to date there are few examples in the United States of such criminal antinuclear behavior. Outside of misdemeanor trespassing during demonstrations at nuclear facilities, the record of criminal actions by antinuclear extremists is sparse. Domestically, we can point to a few cases of low-level sabotage apparently motivated by antinuclear sentiments; other countries, such as Germany, provide some precedents for more serious antinuclear crimes.

We begin with the assumption that the antinuclear extremist shares the basic attributes of antinuclear activists generally. In fact, we tend to envision the potentially criminal antinuclear extremist as an activist who has become frustrated with the campaign to stop nuclear programs through conventional legal channels and is therefore willing to escalate to criminal actions. Like antinuclear activists generally, however, he is likely to be relatively well educated, concerned with building a political constituency for the antinuclear position, and reluctant to imperil public safety. He is likely to view any action as part of a continuing crusade, rather than a one-time effort, and to be concerned with exploiting the publicity potential of his crime. Sam Lovejoy, a folk hero of the antinuclear movement since his 1974 toppling of a 500-foot meteorological tower at a planned nuclear power plant site at Montague, Massachusetts, has reported that he conceived his action as providing him with "two levels of theatre"—the tower toppling itself and his subsequent trial, which would serve as a forum for his antinuclear views.¹

The antinuclear extremist is likely to be surrounded by people who share his world view and could reinforce his sense that the urgency of the struggle justifies even extreme and possibly dangerous actions. It is plausible that a group of like-thinking people could conspire to commit a criminal act and might possess (or could acquire) the technical know-how and organizational skills to carry it out. It is also conceivable that they could recruit assistance from sympathetic employees of a nuclear plant, or alternatively (although less likely because of the time it would take) could themselves seek employment within a plant in preparation for some future antinuclear criminal scheme.

We do not assign a high likelihood to any of these scenarios, insofar as, at least at present, we perceive most antinuclear activists as sensitive to the possibility that

¹ Los Angeles Times, November 18, 1979.
criminal actions would do more to jeopardize their cause than to advance it. Willingness to undertake extreme actions could increase, however, if the antinuclear movement suffered serious political defeats, in response to highly visible and unpopular government decisions in support of nuclear programs, or in the wake of a major nuclear accident.

Moreover, as we observed in our earlier report, any widely publicized protest movement that grows in size may attract some extreme and irrational people who are drawn to the movement by the prospect of publicity, adventure, excitement, danger, and action. If such individuals attach themselves to the antinuclear movement, they might prove uncontrollable and commit violent acts not condoned by others in the movement.

Before turning to the ratings of the appeal of various actions to antinuclear extremists, in the following two sections we address two aspects of our analysis that underlie the appeals ratings. The first traces recent developments in the U.S. antinuclear movement. Much of the discussion deals with recent debates within that movement about appropriate tactics. Although most antinuclear protesters cannot be called extremists, we believe it is vital to follow the course of the antinuclear movement in order to understand the context from which antinuclear crimes might emerge.

The second section deals with precedents for violent antinuclear actions outside the United States, emphasizing incidents that have occurred (or that have come to our attention) since we wrote our previous report on this subject. Next come the ratings of the appeal of various potential crimes, followed by some conclusions.

**TRENDS IN THE U.S. ANTINUCLEAR MOVEMENT**

The late 1970s were a period of "antinuclear proliferation" in the United States. One source estimates that there are about one thousand local groups organized around the nation to fight nuclear power. As one activist commented, "Every group has a little different angle. People get concerned about new issues. Existing groups are not quite what they want to work through so new groups are formed."

In July 1976, the Nuclear Regulatory Commission granted a construction permit for a nuclear power plant at Seabrook, New Hampshire. Six days later, New England antinuclear groups joined to form the Clamshell Alliance to oppose Seabrook by "direct action." Since then, numerous antinuclear alliances elsewhere in the country have patterned themselves after Clamshell: Catfish (Alabama), Abalone (California), Cactus (Colorado, New Mexico, Nevada), Prairie (Illinois), Sunflower (Kansas), Paddlwheel (Kentucky), Oystershell (Louisiana), Headwaters (Montana), Northern Sun (Minnesota), Shad (New York), Lone Star (Texas), Crabsheel (Washington). A prominent movement organizer describes these alliances as "very decentralized, very localized, with very, very different capabilities in terms of resources, sophistication and size. They’re the shock troops of the movement."

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4 Carol Jensen, Concerned Clergy and Laity in New York, quoted in Los Angeles Times, November 18, 1979.

An important trend for the last several years has been the effort to merge the campaign against nuclear power with that against nuclear weapons. This represents a sometimes uneasy alliance. Some opponents of nuclear power plants believe that U.S. national security requires further development and deployment of nuclear weapon systems. Moreover, some who oppose nuclear power on environmental, economic, or safety grounds find themselves uncomfortable with aspects of the broader social and political agenda brought to the antinuclear movement by some antiwar and antiweapons activists. Conversely, some foes of the nuclear weapons race have in the past supported peaceful uses of the atom. Recently, emphasis has increasingly been placed on issues likely to link the concerns of the two sides: for example, nuclear waste disposal and the potential for diversion of fissionable material from the world's civilian plutonium economy to weapon programs in Third World states.

In the spring of 1977, Mobilization for Survival, representing a large number of peace organizations, antinuclear power groups, and other citizen groups was formed in an attempt to forge a national coalition out of the diffuse elements of the antinuclear movement. A member of the Mobilization's national coordinating committee describes its inception this way:

The name and four major goals were agreed on, though some had wanted to focus on nuclear disarmament, some on nuclear reactors, some on conversion of war industry to meet human needs. To be an effective coalition, they concluded the Mobilization's ultimate goals would have to include all of these. There were also those who wanted the Mobilization to be mainly a national clearinghouse of information, while others wanted it to initiate mass direct actions. As it turned out, the Mobilization has done both.\(^7\)

In slogan form, the Mobilization's four goals are as follows: "Zero Nuclear Weapons—Stop the Arms Race—Ban Nuclear Power—Meet Human Needs."

For the most part, the U.S. antinuclear movement has been avowedly and actually nonviolent. Protests at nuclear facilities have tended to follow a common model. Demonstrators are organized into affinity groups of ten to twenty people who are trained together (in nonviolent techniques, risks of arrest, and nuclear-related issues) and who stay together during the demonstration. According to press reports, leaders attempt to keep law enforcement officials informed of their plans, discourage the use of drugs and alcohol, and maintain an image of discipline and high moral purpose.\(^8\) Leaders of the movement have stressed the need to avoid violent confrontations that would lead the general public to view the antinuclear position as extremist.

In the last few years, rumblings of discord have been heard within the antinuclear movement over methods. The controversy has been headlined both in the

\(^6\) Joseph Shattan, in an acerbic piece entitled "The No-Nuke Wind Ensemble," The American Spectator, Vol. 13, No. 3, March 1960, reveals the early pro-nuclear record of American leftists. According to Shattan, during the 1950s and early 1960s the American left "was among the staunchest supporters of peaceful nuclear power." He describes Tom Hayden's "Port Huron Statement," drafted for Students for a Democratic Society (SDS) in 1962, as "a veritable paean to the peaceful atom." Shattan continues about the Port Huron Statement: "With nuclear energy, it declared, 'whole cities can easily be powered, yet the dominant nation-states seem more likely to unleash destruction.' Envisioning 'the industrialization of the world,' it said that 'atomic power plants must spring up to make electrical energy available,' and it lambasted the American political establishment for its short-sighted preoccupation with the military uses of atomic power."


general press\textsuperscript{9} and in movement periodicals.\textsuperscript{10} The dispute first surfaced when cracks began to appear in New England’s Clamshell Alliance over strategies for the campaign to halt the Seabrook power plant. In October 1979, the Coalition for Direct Action at Seabrook, a Boston affiliate that splintered from the Clamshell, sponsored an attempt to occupy the Seabrook site using such illegal tactics as cutting fences, slashing the tires of police vehicles, and actively resisting arrest. While the Coalition still claimed to be committed to the philosophy of nonviolence, its endorsement and use of such tactics aroused opposition from more moderate elements of the Clamshell Alliance who denounced the planned occupation as “adventurism” that was potentially dangerous to both the movement and the protesters themselves.\textsuperscript{11} Moderate protesters staged a sympathy vigil across from the main gate to the construction site.

The attempted October occupation by approximately 1500 demonstrators failed. Attempts to cut through fences surrounding the partly completed plant were stopped by state police, National Guardsmen, and local police. Nineteen people were arrested, and several demonstrators were injured during an unsuccessful attempt to block police vans transporting those under arrest.

Several months later, in January 1980, it was reported that the Clamshell Alliance, at an unpublicized conference attended by about 150 New England antinuclear activists, had “endorsed almost all types of protests against nuclear power plants, presumably including the destruction of property” but drawing the line at violence against people.\textsuperscript{12} The adoption of this policy was regarded as victory for the more militant wing, which wanted to move beyond the movement’s traditional civil disobedience and symbolic protests. One participant commented: “It’s a concession by the people who didn’t want to cut fences.”

On Memorial Day weekend 1980, the Coalition for Direct Action staged another attempted occupation of the Seabrook construction site. During a day-long series of assaults that grew in intensity, an estimated 1300 demonstrators wearing goggles and carrying plywood shields were repelled by state troopers, National Guardsmen, and police using Mace, pepper gas, clubs, and water hoses. Protesters succeeded in temporarily barricading two gates and removing several sections of fence around the 120-acre site. Four persons were arrested and eleven, including one state policeman, were reported injured.

There were fewer participants than at previous Seabrook demonstrations, but they were reported to be more aggressive and decisive in their intents than during the previous October’s direct action. Protesters reportedly had studied occupation tactics used in Germany and by the demonstrators who overran the Narita airport in Tokyo. Training in the use of wire cutters and grappling hooks was given at practice sessions in Boston. New Hampshire’s Attorney General stated, “This group is better disciplined, it’s better organized and they seem to be better able to coordinate their efforts around the site.”\textsuperscript{13}

\textsuperscript{12} Associated Press, January 8, 1980.
\textsuperscript{13} This account of the demonstration is based on coverage in the \textit{Boston Sunday Globe}, May 25, 1980.
The clashes at Seabrook have sparked controversy about the future direction of the antinuclear movement. A member of the Coalition for Direct Action at Seabrook said, "We failed in our immediate goal to occupy the site, but part of our goal was to build a direct action movement against nuclear power, and we feel we've been successful in taking another giant step in achieving that goal." A spokesman for the Nuclear Information and Resource Service in Washington, D.C., disagreed with this assessment, arguing that the Seabrook action would have little influence on the 1000 or so antinuclear groups throughout the country. "There is definitely a faction that views direct action as the only way to address nuclear power... I think, however, that the majority does not look upon it as the thing that's going to make or break nuclear's future."

Does the precedent of a violent confrontation suggest the possibility that moderates will shy away from future demonstrations, giving way to smaller groups of more militant activists? A Harvard graduate student who participated in the Memorial Day demonstration at Seabrook raised this issue in an interview with the press. He claimed that he and other members of the Coalition for Direct Action at Seabrook are committed to nonviolence, but he admitted that this position is becoming more difficult because their numbers are decreasing and that fact may push them to use other tactics, such as sabotage. "We hope it doesn't happen because if we begin to rely on sabotage, we will have to go underground. That's the way they are pushing us. They want the public to think we're nothing but terrorists."

Interestingly, Sam Lovejoy, who initiated the era of direct antinuclear action by toppling the meteorological tower six years earlier, was critical of the direct-action efforts at Seabrook. Lovejoy, a founder of the Clamshell Alliance, described it as

...a broadening of the movement and not necessarily to good ends. In my opinion, they set back the movement by acting in an intemperate and aggressive manner. It's frustration, which is the product of youth, and I know because I was young and I went through the exact same change in the antinuclear... The antiwar movement kept fighting the war, getting frustrated and ended up flipping out, smashing things, trashing, and confrontation politics escalated.

Asked if he predicted a similar trend for the antinuclear movement, Lovejoy responded, "If the government doesn't do something, I think from past experience there is an obvious answer. I hope and pray not, but I think it's there staring us in the face."

After the 1979 and 1980 demonstrations at Seabrook, the Clamshell Alliance was sued on behalf of all New Hampshire taxpayers by a candidate for the state's Democratic senatorial nomination. The suit aimed to recover the costs incurred by the state during the two attempted occupations. No one representing Clamshell or its subsidiaries appeared in court at the preliminary hearing, so the plaintiff was granted a default judgment of $200,000. A leading antinuclear activist told Nucleonics Week that the judgment against the Clamshell Alliance "increases the risk of the development of an underground movement that is likely to be violent and under no group control. The court's action inevitably increases the likelihood of terrorism."

16 Los Angeles Times, November 18, 1979.
17 Nucleonics Week, October 9, 1980. Nucleonics Week reported that, in part because of the court judgment, "the Clamshell Alliance has disappeared... Former members who believed in court actions
It is difficult to assess the validity of such predictions, and it is also unclear to what extent developments in New England will influence or be mirrored by trends elsewhere in the country. As the first of the antinuclear alliances and scene of the first major sit-in demonstrations back in 1977, New England and Seabrook have served as models for other parts of the nation. An antinuclear activist in the Three Mile Island vicinity told Nucleonics Week, "There's a struggle in Pennsylvania right now about 'direct action' versus the use of peaceful tactics," suggesting that such debates may be occurring within the antinuclear movement in other regions.

In September 1981, after the Nuclear Regulatory Commission issued a low-power operating license to Pacific Gas and Electric for its Diablo Canyon nuclear power station in California, the Abalone Alliance staged a two-week-long demonstration at the plant site. More than 1800 protesters, who were attempting to prevent workers from entering the site to load fuel elements into the core, were arrested, more than at any previous such demonstration.\(^13\) (While the antinuclear blockade failed to close the facility, the NRC suspended Diablo Canyon's operating license on November 19, 1981, because of the discovery of design and calculating errors related to the plant's earthquake safety.\(^14\))

The recent history of mass political protests in the United States and abroad has shown that small numbers of radicals can provoke violence even when the organizers and most of those present intend an orderly and peaceful demonstration. In addition, moderates within the antinuclear movement are particularly apprehensive about the potentially alienating effects of violent protests at a time when they see the movement attracting increasing numbers of sympathizers.\(^15\)

A final consideration about near-term trends in the antinuclear movement is the possible effect of the change of administration in Washington. The Reagan administration is generally perceived as more sympathetic to the nuclear power industry than the previous administration.\(^21\) It supports the revival of the nuclear breeder reactor program and is expected to streamline the nuclear regulatory process, actions opposed by antinuclear groups.

\(^{13}\) and public education as the way to stir government and the citizenry against nuclear power have dispersed, some of them going to other antinuclear organizations in the New England region. Antinuclear leadership in New Hampshire has devolved upon the Coalition for Direct Action at Seabrook (CDAS), an organization made up of former Clamshell members and others who believe that "direct action"—blockades, attempted occupations and other such tactics—against nuclear power plants is more useful to the antinuclear cause.

Six months later, however, on April 9, 1981, Nucleonics Week reported that according to the Clamshell's Boston chapter, the coalition is "very much alive." The Clamshell source said, "We've just ignored the suit, and nothing's happened. We have no intention of doing anything."

\(^{14}\) Los Angeles Times, September 29, 1981.


\(^{21}\) There is some public opinion survey evidence to support the contention that there is a much larger potential constituency to be organized by the antinuclear movement. The ABC News-Harris Survey reported on June 21, 1979, several months after the accident at Three Mile Island, that of 1498 adults polled nationwide, 78 percent reported that they "would not participate in peaceful protests against the use of nuclear power for electricity," while 18 percent said they would participate in such protests. Extrapolating from the 18 percent who expressed willingness to join in such demonstrations, the pollsters went on to say in their report: "This means that close to 28 million adults say they are prepared to join such demonstrations, which is approximately the same as the number of people who said they would join demonstrations against the Vietnam War in 1966 and 1967. So the number of potential demonstrators to be mobilized by opponents of nuclear power is far higher than the number who have participated in protests up to now." (ABC News-Harris Survey, Vol. 1, No. 76, June 21, 1979.)

Perhaps even more salient in this context than the administration’s policies on civilian nuclear power is its commitment to strengthening the U.S. nuclear arsenal, including development of the neutron bomb. One observer has suggested that, given the continuing economic problems of the nuclear power industry and the harder-line defense policies of the present administration, the Diablo Canyon demonstration could be "the swan song for the 10-year-old environmental campaign against nuclear power, as attention shifts away from local confrontations over the construction of power plants, and into a growing national movement protesting the proliferation of nuclear weapons." 22 Whether the focus is on power plants or nuclear weapons, however, a government that some antinuclear extremists perceive as hostile to their political, social, and environmental world view could be seen by them to justify radical and possibly violent attacks on nuclear programs.

ANTINUCLEAR CRIMES OUTSIDE THE UNITED STATES

The record of violent attacks by antinuclear extremists in other countries may yield some clues about possible future threats to U.S. nuclear facilities from similarly motivated adversaries. We cannot extrapolate directly from foreign, particularly European, experience to the domestic scene, because of differences in the respective political contexts. An analysis of voter choice in the 1976 California nuclear energy initiative offers some insight into these differences:

Although our data show that environmentalist orientations and political liberalism are linked with opposition to nuclear power, these links seem fairly weak. There is no evidence that opposition to nuclear power on the part of the average citizen is part of a strong well-defined ideology encompassing other issue positions. This may explain the nonideological tone of the political debate over nuclear energy in the United States and the strong ideological character of the debate in Western Europe. 23

Of course, the antinuclear activist in the United States may be more ideologically oriented than the average citizen who casts a vote against nuclear power, but in contemplating the transition from lawful antinuclear activist to criminal antinuclear extremist, he or she also operates in an atmosphere different from that in Western Europe. The more violent history of the antinuclear campaign in Western Europe, in terms of both protest demonstrations and incidents of bombing and sabotage, reflects the higher levels of overall political terrorism in Germany, Spain, France, and Italy. As discussed in our 1980 report, some of the most violent attacks against nuclear facilities in Europe, such as the ETA bombings of the Lemoniz power plant, seem to be efforts by terrorist groups with broader political agendas to exploit antinuclear sentiments so as to build larger constituencies for their own causes. And even for purely antinuclear groups in these countries, the availability of political terrorist groups serving as models may encourage escalation to violent tactics.

Thus, we cannot predict that because certain types of antinuclear crimes have been committed abroad, we are likely to witness similar actions in the United States.

For the purposes of security planning, however, we are able to learn something about the likely modus operandi and targets of potential domestic antinuclear extremists by studying the activities of their counterparts overseas.

There are several reasons to assume that, should violent antinuclear extremists emerge in the United States, they might perpetrate crimes similar to those seen to date in other countries. First, imitation generally seems to play a role in the development of terrorist tactics, as in the worldwide spread of airline hijackings and embassy seizures.

Second, the antinuclear movement strives for international exchange and cooperation. Fifty antinuclear activists from 20 nations, including the United States, met in Amsterdam for three days in 1980 "to discuss organizational strategy for blocking nuclear power and weapons development." Publications of the U.S. antinuclear movement, such as Critical Mass Journal (the energy publication of Ralph Nader's Public Citizen, Inc.), feature articles on the antinuclear campaign in other countries. The accident at Three Mile Island gave the United States special prominence in the antinuclear movement worldwide. An activist who lives near the damaged reactor has addressed an antinuclear rally in Germany.

And, of course, the occupation of the nuclear power plant site at Whyl, West Germany, has served as a model for antinuclear protests in other countries, including those at Seabrook and Diablo Canyon. Discussing proposed plans for stopping Diablo Canyon, a statement from California's Abalone Alliance said, "The alliance emphasizes that the blockade/encampment is not merely a symbolic protest, and is intended to actually end further construction and maintenance of the plant and prevent any loading of the uranium fuel into the reactor core, in the event that the NRC authorizes that loading."

Nucleonics Week went on to say, "Sources said the group was encouraged by the occupation of the Whyl nuclear plant site in West Germany in 1975 and that contacts have been made between the organizers there and the Abalone Alliance."

If the direct action wing of the U.S. antinuclear movement learns from its European colleagues, both through personal contacts and through press accounts, it is plausible that potential U.S. extremists contemplating criminal attacks might go through a similar learning process, though we have no evidence to suggest that personal contacts have taken place between foreign antinuclear saboteurs and U.S. antinuclear forces.

Third, and finally, we look to the record of antinuclear attacks elsewhere for guidance about possible developments in the United States, because it suggests the kinds of crimes that antinuclear extremists may be attracted to by motivation and can muster the capability to implement.

As described in our last report, bombing seems to be the preferred mode of attack for antinuclear extremists in Europe. Recent incidents, and some earlier incidents that have been added to the data base, support this conclusion. Bombing targets include nuclear power plants, corporate facilities of companies involved in nuclear development, electrical power lines transmitting energy generated by nuclear plants, nonnuclear-related government buildings, and nuclear research facilities.

A large number of the new incidents in our chronology of actions against nuclear programs abroad occurred in France. Several years ago, a French official reported at a meeting in Europe that there had been 170 attacks against nuclear facilities in that country. The Dieppe Front Against the Nuclear Program claimed credit for two bombings at the offices of Electricité de France at Dieppe in April 1979. (Electricité de France buildings elsewhere in France had been targeted by antinuclear bombers several times in previous years.) In October 1979, a bomb explosion near Lyon destroyed a pylon supporting electric power for the Pierrelatte nuclear enrichment plant; a group of ecologists opposed to nuclear energy claimed responsibility. In late May 1980, unidentified saboteurs twice used explosive charges to damage one of the pylons supporting two cables carrying 400,000 volts of current from the Fessenheim plant to Mery-sur-Seine in Northeastern France.

Also in May 1980, a container of dynamite was discovered by chance near Framatome’s main pressure vessel plant at Chalon-sur-Saone in a water canal used to transport large reactor parts. Authorities said it was unlikely that any explosion would have damaged the plant itself, but that its placement indicated attempted sabotage. In June 1980, a previously unknown group called the Communist Antinuclear Front took credit for bombings at the Parisian offices of five enterprises. A telephone call to the press said the attacks were targeted against “enterprises making material for the construction of nuclear centrales against the nuclear capitalist society. Long live proletarian sabotage.”

On the night of January 18, 1982, five antitank rockets were fired at the breeder reactor under construction at Creys-Malville, France.26 Four of the five rockets hit the concrete outer shell of the reactor building, but there was little damage and none of the 20 workers on the site at the time was injured. In a telephone call to a French news agency, an anonymous spokesman claimed responsibility for a “Pacifist and Ecologist Committee” and stated that the group had taken every precaution to assure that no one would be hurt. Police found the rocket launcher 400 yards from the plant on the opposite bank of the Rhone River. It and the rockets were described as Soviet RPG-7s, built in the 1960s and easily available in European illegal arms markets. Ecological and conservation groups in France denounced the attack but reiterated their opposition to France’s nuclear power program.

Antinuclear saboteurs continue to be active in Germany as well. West German police have confirmed that since 1977 eight northern German nuclear reactors have been sabotaged with homemade bombs and explosives. A “Do-It-Yourself-Manual” offering detailed instructions in nuclear sabotage was available for a time in left-wing bookstores in Germany before it was withdrawn from circulation, presumably because its sellers feared prosecution.27 The booklet recommended that resisters not target reactors themselves, because of radiation danger, but rather concentrate on sabotaging electrical power components, using either explosives or other suggested means. German authorities are uncertain whether the perpetrators of the attacks against the nuclear reactors and the publishers of the manual belong to a potential terrorist group or to extreme wings of that country’s largely nonviolent environmentalist groups.

The most recent West German antinuclear bombing incident of which we are aware took place in April 1979. Two homemade bombs damaged a mast carrying a high-tension line from the Esensham nuclear plant near Bremerhaven in northern Germany, but the line remained intact. Two other bombs failed to go off. In June 1979 a bomb exploded at the back of a Frankfurt building housing offices of the Uranlegesellschaft (Uranium Company), causing $50,000 damage. A letter to authorities stated: "We have damaged the building a little bit in which the Uranium Company is located. After Harrisburg, we don't want to accept this man-killing technology, but to help by this action to stop atomic energy."

For purposes of identifying possible precedents for potential future antinuclear crimes in the United States, it may be especially worth noting the experiences of Switzerland and Sweden, two European countries that, unlike Germany, France, and Spain, have experienced relatively little domestic political terrorism. (International terrorists have staged a number of operations in Sweden, however.) Our chronology reports four nuclear-related bombings in Switzerland in 1979. On February 19, only hours after the Swiss public had rejected a constitutional amendment that would have severely restricted the licensing of Swiss nuclear plants, the nuclear energy information center at the Kaiserrangst nuclear power plant construction site near Basel was bombed by a radical antinuclear group calling itself "Antinuclear People." The bomb completely destroyed the pavilion, causing damage estimated at $600,000. Other targets of bombs in Switzerland have been a material storage depository on the grounds of the Leibstadt nuclear station, where there was little damage; and a weather pylon which fell on a transformer installation at Goesgen, the country's latest nuclear power plant, causing approximately $600,000 damage. Also, in May 1979, five cars and a garage belonging to senior Swiss nuclear power officials were firebombed in different parts of the country. The press received a letter from a group calling itself "Opponents of Nuclear Energy," claiming responsibility for a seventh bomb that failed to go off.

In Sweden, an antinuclear individual or group that signed messages with the letter "M" was seemingly responsible for several incidents in the late 1970s. In November 1976, a dynamite bomb with a detonator was found by police at the outer fence of the Ringhals nuclear plant after a Goteborg newspaper received a note from "M" saying, "This is a last warning. Next time we will level the station to the ground." Authorities said that, had the bomb exploded, it would have damaged the plant's switchyard but would not have affected the nuclear part of the facility. In May 1978, "M" sent a letter to a Goteborg newspaper warning that unless the letter, which protested the development of nuclear power in Sweden, were read on radio and television, a bomb would be detonated behind the Goteborg courthouse. The demand was not met and a 5 kilogram explosive device was detonated at the courthouse, blowing out windows there and at a nearby church. Subsequently, explosives were also found outside a nuclear power plant at Barseback; Swedish police suspect that "M" was once again responsible.

The limited violent antinuclear activity in Sweden seems to be the work of an isolated individual or group. But an interesting public opinion poll suggests that others might potentially be willing to resort to such tactics. In March 1980, a referendum that could have closed existing plants and halted further nuclear development was defeated by Swedish voters. Two weeks prior to the referendum, Swedes were interviewed about their position on the issue. Those who supported Line Three,
the strongest antinuclear position, were asked: "If the yes-side wins in the nuclear power vote, what do you think the opposition should do?" Ten percent chose the following response: "Refuse to accept the decision and continue to fight, employing all kinds of tactics, even violence if necessary, in order to close nuclear power plants." A Swedish expert on terrorism, Bertil Haggman, asked about the results of this poll, commented: "I am of the opinion that we cannot exclude the possibility of terrorist activity. There may be a small group which is now prepared to resort to violence. The nuclear-power issue has reached that status in Sweden today."28

Several incidents in Europe suggest that antinuclear extremists may be likely to focus their attacks on nuclear materials in transit. In February 1980, a train carrying irradiated fuel from the cenerale of Chinon and bound for the refueling center at La Hague was attacked during the night by antinuclear militants. Two hooded men stopped the convoy 11 kilometers before Bayeux by means of a red light, sawed through the brake conduit, and painted antinuclear slogans on the cars. The train then proceeded slowly to Bayeux where it was repaired before reaching La Hague six hours late. The "Movement of Resistance to Nuclearization," unknown until then, claimed credit. Its communiqué explained that it wished to "denounce the French electro-nuclear program of the refueling plant at La Hague, a veritable world atomic garbage can, representing the most dangerous and the most polluting link."

In July 1980, police arrested seven people after twenty antinuclear protesters forced a train carrying radioactive waste to halt in the English countryside between Gloucester and Sharpness. It was headed for the Sharpness docks, where it was to be loaded on a ship for burial 500 miles out in the Atlantic, in 2.5-mile-deep water. Three women and four men were detained after resisting arrest. Police then called in heavy machinery to clear the line. The protesters, from an organization called the Bath Antinuclear Group, had erected a 10-foot-high scaffold on the tracks at dawn, along with antinuclear banners, and stood on it as the train approached and ground to a halt. They had given no advance warning. Although the barrier was on a straight stretch of track, a British Rail spokesman asserted, "Had this train been going through at a time when the light was not so good, it could have plowed straight through this obstruction, possibly injuring the demonstrators and the crew." A United Kingdom Atomic Energy Authority spokesman later said there was no danger to the public since the radioactive material was encased in cement.

Antinuclear activists have recently become active on the seas as well as on land. In February 1980, riot police and naval authorities in the French port of Cherbourg clashed with antinuclear demonstrators pursuing a British ship carrying spent nuclear fuel from Japan. Naval officials said the Pacific Swan was chased into port by the Rainbow Warrior, a vessel manned by antinuclear militants from the environmentalist organization Greenpeace, but gunboats of the French navy protected the cargo ship and guided it into port, where the atomic waste was unloaded without incident. Initial reports said the clashes were violent, but there were no immediate reports of casualties.29 In England the previous week, after Greenpeace refused to pledge noninterference with entry of ships into Barrow docks, the port for British Nuclear Fuels Limited's Windscale reprocessing plant, the English High Court

upheld an injunction against such interference. The director of Greenpeace said, however, "We're going to push this campaign as far as we possibly can."30

A final unusual action deserves mention. On June 2, 1979, during an attempted occupation of the construction site of the Darlington nuclear power plant east of Toronto, Canada, five members of Greenpeace parachuted onto the site. (Other demonstrators had entered the not very heavily guarded construction site by tunneling under or climbing over the fence.) The five parachutists were arrested, jailed for three days, and fined $200 each. The organization viewed the jump as a means of dramatizing its opposition to nuclear power by showing that its members were even willing to risk their lives for the cause. This perhaps suggests the level of innovativeness and dedication that may be demonstrated by some antinuclear extremists in the future.

THE APPEAL OF NUCLEAR-RELATED CRIMES TO ANTINUCLEAR EXTREMISTS

Table 6 shows the relative appeal of the various crimes judged to be consistent with the motivations of antinuclear extremists. A discussion of the rationale for these ratings follows.

High-Appeal Crimes

1. Low-level sabotage. The notorious toppling of the meteorological tower by Sam Lovejoy can be called low-level sabotage. Another possible example is the

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<td>Low-level sabotage</td>
<td>Low-level standoff attack</td>
</tr>
<tr>
<td>Trespass</td>
<td>High-level standoff attack</td>
</tr>
<tr>
<td>Incitement to illegal actions</td>
<td>Sabotage endangering human lives</td>
</tr>
<tr>
<td>Disclosure, theft, or purchase of classified information</td>
<td>Theft of non-SNM</td>
</tr>
<tr>
<td>Interference with transport of nuclear fuels or wastes</td>
<td>Theft of small quantities of SNM</td>
</tr>
<tr>
<td></td>
<td>Nuclear threats</td>
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</tbody>
</table>

30 Nucleonics Week, February 14, 1980, p. 2.
destruction of fuel rods by plant employees at the Vepco plant in Virginia, who said they did it to publicize the lax security at the plant. Such crimes for "demonstration purposes," particularly if they do not endanger human lives, seem especially attractive to antinuclear extremists, given their nonviolent origins. If one credits the October 1977 bombing of the visitors' center at the Trojan nuclear power plant in Oregon, which was claimed by the "Environmental Assault Unit" of the new World Liberation Front, to antinuclear motivations (rather than to political terrorism), it would constitute another case of low-level sabotage. So would the efforts to cut through the fence and occupy the Seabrook nuclear power plant site. In short, low-level sabotage seems particularly consonant with the attributes, capabilities, and motivations of antinuclear extremists.

2. Trespass. The history of the U.S. antinuclear movement demonstrates that trespass is well within the capabilities of its adherents. Attempted occupation of nuclear plant sites has in the last few years been a favored strategy of antinuclear protesters, notably at Seabrook and Diablo Canyon.

3. Incitement to illegal actions. During the attempted occupation at Seabrook in May 1980, state troopers, National Guardsmen, and police used Mace, pepper gas, clubs, and water hoses to repel an estimated 1800 demonstrators. Despite the avowed commitment of most of the antinuclear movement to nonviolent protest tactics, it is quite possible that, in the frenzy of such a confrontation, extremists could be incited to more serious illegal and possibly violent actions.

4. Disclosure, theft, or purchase of classified information. It seems consistent with both the motivations and capabilities of antinuclear extremists to acquire and publicize classified or sensitive information about nuclear programs in an effort to tarnish the image of the nuclear community. Disclosure, of course, implies a crime carried out by an insider. It is conceivable that a person with strong antinuclear views could hold an inside position with access to such information. Alternatively, theft or purchase of compromising information seems within the capabilities of antinuclear extremists.

5. Interference with transport of nuclear fuels or wastes. This class of crimes was not included in the earlier matrix, but the above-mentioned train-stoppings and ship-pursuit in England and France suggest their attractiveness to antinuclear extremists.

The antinuclear movement's desire to alert the public to alleged dangers of transporting nuclear materials, and the likelihood that transportation facilities will be less well guarded than stationary ones, may combine to increase the appeal of nuclear transport as a target.

Medium-Appeal Crimes

1. Low-level standoff attack. While antinuclear extremists in the United States and abroad have used explosives, we are unaware of their ever having used firearms.31 Should an antinuclear extremist choose to engage in a low-level standoff attack, guns would not be hard to obtain. But, given the attributes and actions they have displayed to date, we consider such crimes to hold only medium appeal.

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31 We have been told that trucks transporting nuclear missiles within the United States have been the targets of rifle fire, but the motivation for these attacks is unknown. There is no basis for attributing these incidents to antinuclear extremists.
2. High-level standoff attack. The recent high-level standoff attack on the breeder reactor being constructed at Creys-Manville, France, was claimed by a "Pacifist and Ecologist Committee." Ten days later, an unnamed group sent eight videotapes to U.S. news organizations, apparently depicting flares going off near the Zion, Illinois, nuclear plant, about 30 miles from Chicago. An accompanying note said, "This was a warning, the next attack will be real." A spokesman for Commonwealth Edison, which owns the Zion plant, described the incident as a "publicity stunt" and said it may have been inspired by the earlier French rocket attack. Nonetheless, the incident provides the first evidence of presumed antinuclear extremists in the United States even contemplating a high-level standoff attack. While the appeal of an actual attack still does not seem high for such groups in the United States, we must assume that they could obtain the weapons if they so chose, and so high-level standoff is rated medium appeal.

3. Sabotage endangering human lives. Sabotage endangering human lives would be a major escalation for antinuclear extremists and would clearly stand to damage the image of the movement. Barring major changes in circumstances, we doubt that antinuclear extremists would attempt such an action in the United States. Should the situation make such a crime more attractive to them at some point in the future, however, they probably could acquire the necessary capability, including access and insider assistance. We have therefore rated this as holding medium appeal.

4. Theft of non-SNM or of small quantities of SNM. The motivation for antinuclear extremists to commit such thefts would be to demonstrate and publicize the vulnerability of nuclear facilities. Either sort of theft would conceivably be within their capabilities, either through an insider confederate or deception, but they would not be likely to use force. We have rated these crimes as only of medium appeal, however, because we are unaware of any precedent for such actions either in the United States or abroad. Even if the perpetrators were not themselves armed, they could be exposed to potential danger if caught in the act by armed guards and eventually subjected to severe criminal penalties once apprehended. It is dubious that the crime's publicity value to the antinuclear cause would outweigh these risks and costs.

5. Mass occupation of a nuclear facility. As noted above, antinuclear demonstrators in the United States and Europe have on several occasions occupied sites where nuclear power plants were under construction. Here we consider the occupation of a facility already in operation.

We doubt that antinuclear extremists would attempt to seize and hold a nuclear facility by a terrorist-style armed raid. We can, however, envision a takeover by a large crowd that overwhelms security personnel by sheer force of numbers or, alternatively, a strategy by which a mob of protesters diverts the attention of police and security personnel while a small cadre seizes the facility. Such a strategy was employed at Japan's new Narita airport in 1978, where a small team of hammer-wielding leftist terrorists stormed the control tower and wrought extensive damage while a much larger crowd occupied the attentions of the security force. In the antinuclear case, we would expect any takeover to be used primarily for publicity purposes rather than to wreak physical destruction on the facilities.

6. Nuclear threats. The capability needed to issue a nuclear threat is minimal indeed—a pen, a sheet of paper, and a postage stamp, or, alternatively, access to a
telephone. It is conceivable that an antinuclear extremist would view such a threat as a way of arousing public anxiety about nuclear programs or embarrassing the nuclear community. We do not regard threats as highly appealing to the antinuclear extremist, however, because they could backfire and harm the image of the antinuclear movement.

**Low-Appeal Crimes**

1. *Theft of strategic quantities of SNM.* The theft of SNM in strategic quantities would require the perpetrators to penetrate targets defended by armed guards, in a type of violent assault that has never been attempted even by European terrorist groups. Antinuclear extremists apparently do not possess the capabilities to carry out such an action, and we consider it extremely unlikely that they would attempt to do so.

**CONCLUSIONS**

In the United States to date, there have been few felonious crimes against nuclear programs attributable to antinuclear sentiments. In Europe, where antinuclear extremists have committed more violent attacks against nuclear programs, bombing has been their preferred means. For the most part, the targets of their bombs have been nuclear power plants under construction or electrical power lines connected to nuclear reactors. No operating nuclear reactor has been bombed by antinuclear extremists, which may reflect either the tighter security surrounding such facilities or the extremists’ reluctance to risk an explosion that could cause radioactive release. Other targets of antinuclear extremists’ bombs have included government buildings and the offices of companies involved in nuclear power development.

As described in Chap. 3, the most violent attacks on European nuclear programs have come not from antinuclear extremists but from political or separatist terrorist groups, such as ETA in Spain, seeking to exploit antinuclear sentiments. Should European antinuclear extremists in other countries choose to escalate their struggle, they might undertake the bolder types of attacks pioneered by ETA, such as the 1979 raid and kidnapping at the Maliano nuclear instruments plant and the 1981 kidnapping and murder of the chief engineer at Lemoniz.

The more violent history of the antinuclear campaign in Europe does not necessarily presage similar developments in the United States, because of the differences in political and social context. The European countries that have experienced the most antinuclear violence to date have also suffered high levels of overall political terrorism.

Should some extremist element of the U.S. antinuclear movement decide to escalate to violent tactics in the years ahead, however, bombings would be a predictable mode of attack. During the late 1960s and early 1970s, political bombings by

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32 In 1975, an unidentified group of terrorists planted explosive charges that caused minor damage at the Mt. D'Arree Nuclear Power Plant in Brittany, France. The nuclear reactor was operating at the time, but there was no damage to the reactor and no release of radioactivity. No one claimed responsibility for the act, but French police suspect a Breton separatist group. We are assuming that this crime was not motivated strictly by antinuclear sentiments.
U.S. antiwar and revolutionary groups were frequent. Activities by such groups declined in the latter part of the last decade, after the Vietnam War, but ethnic terrorist groups (Croatians, Cubans, Puerto Ricans) continue to favor bombing as a means of expression. There is also a time-honored tradition in this country of bombing as a way of settling personal and labor-related grievances. The likelihood of antinuclear bombings depends upon the outcome of the current debate over tactics within the antinuclear movement, upon government and industry decisions about nuclear programs, and upon other developments in the political environment.
Chapter 5
THE POTENTIAL FOR NUCLEAR-RELATED CRIMES BY HOSTILE EMPLOYEES

Employees who decide to initiate criminal actions pose a particular danger because of their special knowledge and access to nuclear information and facilities. Their motivations may be ideological, economic, personal, or some combination of the three.

It is difficult to analyze hostile employees as a single category of potential adversary because they are so diverse and because they overlap with other categories. Several of the subcategories of hostile employees identified in the 1980 report are considered elsewhere in this report. Psychotic employees are discussed in Chap. 6. Employees motivated by economic gain are treated in Chap. 2 as occasional criminals or opportunists operating as insiders. Employees who commit crimes because of disillusionment with nuclear programs can be considered antinuclear extremists and, as such, are discussed in Chap. 4.

Consequently, this chapter is confined to hostile employees who are motivated by job-related grievances or situations created by labor-management strife. Employees who are frustrated in their jobs because of real or imagined slights or ill-treatment by their employers, supervisors, or co-workers often attempt to avenge themselves through criminal acts. Likewise, during strikes or other labor-related conflicts, employees have been known to resort to harassment, vandalism, and sabotage against company property. The nuclear industry is potentially vulnerable to such attacks.

Most of the defensive systems designed to prevent attacks by outsiders provide no protection against hostile employees. Exterior fences, armed guards, and sophisticated monitoring equipment are largely irrelevant. Factors likely to deter crime by outsiders, such as lack of information about a facility and its operations, and about the various uses, value, and location of nuclear materials, do not apply to insiders, because they are privy to such information as part of their everyday activities. Nuclear facilities do, of course, try to minimize the potential insider threat by use of clearances and a system that limits access to classified information to those with need-to-know certifications. The system also incorporates defenses against theft of certain materials.

Screening is far from infallible, however, nor are clearances any guarantee. Clearances are most valid on the day they are issued; their validity decreases over time while the employee's information, knowledge, and ability to damage the system increase.

Table 7 shows the appeal levels for crimes that hostile employees might be motivated to commit.
Table 7
The Appeal of Nuclear-Related Crimes to Hostile Employees

<table>
<thead>
<tr>
<th></th>
<th>High Appeal</th>
<th>Medium Appeal</th>
<th>Low Appeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theft of non-SNM</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Theft of small quantities of SNM</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Low-level sabotage</td>
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<tr>
<td>Low-level standoff attack</td>
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<tr>
<td>Sabotage endangering human lives</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Armed seizure</td>
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<td></td>
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<tr>
<td>Mass occupation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Interference with transport of nuclear fuels or wastes</td>
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<td></td>
<td></td>
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<tr>
<td>Threats of violence against persons</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Nuclear threats in connection with extortion or coercion</td>
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THE APPEAL OF NUCLEAR-RELATED CRIMES TO HOSTILE EMPLOYEES

High-Appeal Crimes

As was the case in rating the appeal of nuclear-related crimes to criminal insiders (Table 4), only the high-appeal column of Table 7 has entries. The types of crimes listed under high appeal are those often taken by hostile employees in nonnuclear settings, and, for some, we also have precedents in nuclear facilities. Inside access and the ability to discover vulnerabilities in security systems enhance the hostile employee's capability to do damage.

1. **Theft of non-SNM.** Theft of non-SNM, such as equipment or conventional explosives, is a relatively common occurrence among employees who feel that their employer "owes them something" and so receives a rating of high appeal.

2. **Theft of small quantities of SNM.** The perpetrator of the Wilmington, North Carolina, theft of uranium oxide and the subsequent extortion threat was partly motivated by a job-related grievance. While theft of small quantities of SNM would be more difficult, because it is more closely guarded than uranium oxide, the capability cannot be ruled out for the hostile employee.

3. **Low-level sabotage.** Low-level sabotage would hold high appeal for hostile employees seeking to disrupt operations and cause economic loss to their employer without endangering human lives. There was a well-publicized case of low-level sabotage at the Virginia Electric Power Company's Surry nuclear plant in 1979. Two control-room trainees poured sodium hydroxide on 62 stored fuel assemblies, causing approximately $1 million in damage. The two claimed they
wanted to call attention to lax security and safety measures at the plant. They were each sentenced to two-year prison terms.

4. **Low-level standoff attack.** Low-level standoff attack (such as rifle fire) might hold special appeal to the recently terminated employee who feels he has been treated unfairly. As with low-level sabotage, this crime has the advantage of allowing the adversary to protect his anonymity if he so desires.

5. **Nuclear threats, threats of violence against persons.** Nuclear threats, threats of violence against persons, and conventional bomb threats allow the hostile employee to interfere with a facility's work and thereby inflict financial damage without identifying himself. The minimal resources needed to issue (as opposed to implement) such threats make them common forms of action for hostile employees.

6. **Sabotage endangering human lives.** Such sabotage would hold high appeal for certain hostile employees. Train derailments during the 1963-64 strike by the National Railway Brotherhods against the Florida East Coast Railroad provide a historical analog. In the nuclear context, hostile employees would be more likely to commit sabotage aimed at endangering supervisors or co-workers against whom they held a grievance, rather than the public at large.

7. **Armed seizure, mass occupation.** Illegal occupation of a facility represents an obvious escalation in severity, but precedents exist for such actions in nonnuclear industries, especially in the context of labor disputes. Seizing and holding a facility would be difficult for a lone disgruntled employee, but a team of workers could deny management access to a facility (or part of a facility). A small group of hostile workers could carry out an armed seizure; a large number could stage a mass occupation. There is a foreign precedent. In 1977, workers at Lemoniz in Spain took over the reactor's control room by force and threatened to destroy computers and instruments unless management agreed to grant their labor demands. In 1980, Lemoniz workers again attempted to enter the control room by battering the door with their tools. This time, however, the plant's guards held out for four hours until help arrived to quell the attack.

8. **Interference with transport of nuclear fuels or wastes.** During strike actions or other labor-management strife in nonnuclear industries, employees have been known to try to halt shipments into or out of company facilities. In the nuclear context, hostile employees might try to interfere with the transport of nuclear fuels or wastes, or with delivery of other equipment or supplies to facilities.

**Medium-Appeal Crimes:** None

**Low-Appeal Crimes:** None

Of the crimes previously judged consistent with the motivations of hostile employees, all are crimes that have been committed by hostile employees in nuclear or other industrial contexts, and none can be ruled out for lack of capabilities. Consequently, no crimes have been rated as holding medium or low appeal.
COERCION OF NUCLEAR EMPLOYEES

It is possible that employees could be coerced by other types of adversaries to assist them in crimes against nuclear facilities. In recent years, there have been several instances where the families of bank managers have been held hostage in order to force the managers to cooperate in robbery schemes. Similarly, nuclear facility employees are potentially susceptible to blackmail plots or to threats of violence against themselves or their families. We have not rated the "appeal" of various crimes to coerced employees, since they would be acting solely out of fear.

The adversaries most likely to seek inside assistance through coercion are professional criminals and agents of foreign governments who are bent on espionage, theft, or sabotage.
Chapter 6

PSYCHOTICS AND IDIOSYNCRATIC ADVERSEIS

This chapter briefly discusses two types of adversaries whose motivations were considered in the second report (R-2554-SL): psychotics and idiosyncratic adversaries. We will not rate the appeal of various crimes to these adversaries, however, for reasons discussed in each of the following sections.

PSYCHOTICS AS POTENTIAL ADVERSARIES

The matrix in the earlier report, instead of listing specific crimes that fit the motivations of psychotics, as it did for other types of adversaries, offered the following statement: "No action can be eliminated from the range of psychotic behavior."

Rating the appeal of various nuclear-related crimes to psychotics is still problematic because we cannot assume that the psychotic's behavior is goal-oriented like that of most other adversaries, or that he rationally considers his capabilities or chances of success. Psychotics' actions often emerge from bizarre inner drives that are unrelated to anything happening in the "real world." There is virtually no way of reliably predicting which nuclear-related crimes would hold greater or lesser appeal to psychotics generally.¹

For the present purpose, it is useful to distinguish among dysfunctional, functional, and episodic psychotics.

Dysfunctional psychotics, as the name implies, are unable to perform any function that requires organized, unimpaired thinking, even over very short periods of time. They are out of touch with reality. Many such people are institutionalized or otherwise supervised and attended. However, even those dysfunctional psychotics who live on their own are incapable of generating either a complex plan or the wherewithal to carry it out. In short, dysfunctional psychotics are highly unlikely to pose a threat to nuclear facilities even if they wanted to.

Functional psychotics, on the other hand, are individuals whose psychoses do not interfere with their capacity to think, plan, organize, and even carry out complex actions. They may hold down regular jobs and not arouse suspicions of neighbors or co-workers, though it is common for them to be perceived as loners. Two functional psychotics who carried out technically sophisticated bombing campaigns are George Metesky, the "Mad Bomber of Manhattan," and Muharem Kurbegovic, the "Alphabomb Bomber" of Los Angeles, who were discussed at greater length in the report on motivations of potential criminal adversaries (R-2554-SL). Both men were psychotic prior to and during their series of bombings. They embarked upon a campaign of violence rather than a single act, demonstrated considerable technical competence in the design and manufacture of their devices, were functional in everyday society,

¹ A psychiatrist or psychologist familiar with a particular individual might be able to predict which crimes or targets would attract him, but this is irrelevant to the problem considered here.
and were aware of social issues and incorporated them into their deadly campaigns. Such people could conceivably pose a threat to nuclear programs.

An *episodic psychotic* is a person who functions normally in society and then, possibly quite suddenly, suffers a psychotic break. This could happen virtually without warning to the individual or those close to him or her. The episodic break usually occurs as a result of a stressful environment or problem, and a buildup of extreme tension. It may or may not be triggered by an incident or event that is obvious to others. The episode may be temporary, after which the individual resumes normal behavior.

The clinical manifestations of a psychotic break may differ greatly from individual to individual, so that even if one knew that such an episode were imminent, it would be difficult to predict the time and the particular psychotic behavior that would accompany the episode. Episodic psychotics may represent a considerable danger to themselves and others. They may be either functional or dysfunctional during the psychotic break, though dysfunction is more common. Obviously, if someone inside a nuclear facility were to undergo a psychotic break, he or she could potentially cause serious damage, particularly if employed in a key position. This would be especially true if the episode produced functional psychotic behavior, but even a dysfunctional psychotic episode could pose a significant danger.

One of the reasons that an insider psychotic could pose an especially serious threat to nuclear facilities is that, unlike the professional criminals, terrorists, and conventional hostile employees discussed in earlier chapters, he is not socially constrained with respect to the extent of harm his actions may bring. The thinking of a psychotic does not include such considerations as fair play, the risk of being caught, or the impact his actions would have on some real or imagined constituency. Thus, for psychotics, there are fewer internal or societal barriers to committing acts that might result in mass death and destruction. A psychotic employee in a nuclear facility might attempt sabotage that endangers human lives, or a barricade and hostage operation, as psychotics have been known to do in other work situations. Fortunately, however, even functional psychotics usually lack the personality requirements for working closely with others, so the chances for a psychotically generated internal conspiracy are relatively slight.

To sum up, the potential threat to nuclear facilities by psychotics could involve any of these adversaries: a *functional psychotic outsider*; a *functional psychotic insider*; an *episodic psychotic* whose behavior may be either functional or dysfunctional.

The functional psychotic outsider has the capacity to plot, plan, and execute, and might become involved in complex plots of coercion or penetration by deception. The same types of defenses used to foil criminal or terrorist adversaries would presumably serve to protect against this type of adversary.

But what about the danger of functional or episodic psychotics inside a nuclear facility? Unfortunately, superficial psychological screening mechanisms, such as self-administered personality profile questionnaires (e.g., MMPI), are unlikely to detect the functional psychotic, who may be sufficiently clever and calculating to answer the questions so as not to arouse suspicion. There is a good chance that a psychiatrist or psychologist could identify most such functional psychotics in hour-long screening interviews, but future episodic psychotics could slip through the mesh and be hired. Psychotic breaks are unrelated to levels of intelligence, job responsibili-
ties, or clearances, and for the most part are difficult to predict, even for mental health professionals.

Not many people experience psychotic breaks, and not all of those who do are bent on hostile acts. Still, since there is probably no foolproof way of totally eliminating this risk in nuclear facilities, some special precautionary measures might be considered.

There are techniques for "defusing" some psychotic emergencies (e.g., an individual with paranoid delusions suddenly pulling a gun and threatening to do something drastic). Some rudimentary awareness of the "dos" and "don'ts" in such situations could be made available to nuclear facility employees, especially those working in sensitive areas. Also, in many cases, psychotic breaks come on less suddenly. Employees could be made aware of the danger signs of impending mental disturbances and instructed to report them to plant officials. While existing security provisions, such as the two-man rule, do provide some measure of protection against highly destructive actions by an employee experiencing a psychotic break, these additional measures could provide added security.

INDIVIDUALS ACTING FOR IDIOSYNCRATIC REASONS

This category is not merely a residual category or catch-all to capture those potential adversaries not embraced by the other classifications. When we speak of an adversary acting for idiosyncratic reasons, we mean someone who is not psychotic but who engages in hostile actions for reasons peculiar to himself, without seeking economic or political gain. We have in mind, particularly, people intent on demonstrating their cleverness and ability to outwit the system. They may take an action merely "to prove that it could be done." An outsider, for example, might try to infiltrate a nuclear facility. An insider might tamper with computer files or try to "beat" the security system by gaining access to an area officially off limits.

Some nuclear hoax threats probably emanate from this type of adversary. Design and construction of an improvised nuclear device, if done merely to conquer the challenge, rather than to serve some other political or economic goal, would also fall into the idiosyncratic category.

It is difficult to anticipate the full range of possible actions such idiosyncratic adversaries might concoct, or to offer appeal ratings for their various potential crimes. It is probably safe to say, however, that their actions are most likely to be self-aggrandizing and merely disruptive to the system rather than violent or destructive.
Chapter 7

CONCLUSIONS

The first report in this series (R-2225-SL, Attributes of Potential Criminal Adversaries of U.S. Nuclear Programs) argued that potential adversaries of U.S. nuclear programs could mobilize sufficient resources and capabilities for many kinds of criminal actions. The second report (R-2554-SL, Motivations and Possible Actions of Potential Adversaries of U.S. Nuclear Programs) contended that, in terms of motivations and intentions, nuclear programs face a broad array of potential criminal adversaries. When we began the third phase of our study, integrating the earlier analyses of motivations and capabilities, we expected to find that the array of potential actions could be narrowed considerably. We assumed that although potential adversaries might be motivated to commit numerous sorts of crimes, they would refrain from many of them because they lacked the capabilities. To our surprise, we found that few potential actions could be ruled out on that basis.

Tables 8 and 9 summarize the appeals ratings for the various adversaries described in this report. Table 8 is organized according to adversary type, and Table 9 by crime. It is apparent from Table 8 that although some crimes are listed in the low-appeal column—meaning that the adversary would lack the capabilities to carry them out—these are relatively few. Many more crimes fall in the high-appeal category (where motivations, capabilities, and other relevant attributes are all present) and in the medium-appeal category (where motivations and capabilities are present, but the crime is thought to be inconsistent with some other attribute of that adversary). Judging from this matrix, U.S. nuclear programs still face a broad range of potential criminal adversaries who could, if they so chose, muster the capabilities to carry out a wide variety of crimes.

Obviously, the crimes considered here vary widely in the seriousness of their potential consequences. While we have not tried to assess the probability that any of the postulated actions will actually occur, there are certain relatively minor disruptive actions that appeal to several types of adversaries, do not require considerable capability, and have occurred on numerous occasions in the past. These include nuclear hoaxes, threats of sabotage, and low-level sabotage at nuclear facilities (e.g., conventional bombings). It seems likely that such actions will continue to occur.

Of perhaps greater concern, however, is the finding that there are several crimes that could have serious consequences for public safety and which are of high appeal to one or more category of adversaries. These are:

1. Theft of SNM (in small or strategic quantities) by a criminal insider.
2. Armed seizure of a nuclear facility by political terrorists or hostile employees.
3. Mass occupation of a nuclear facility by antinuclear extremists or hostile employees.

Nuclear threats are also of high appeal to several types of adversaries. Even hoax threats could, if cleverly conceived, cause large-scale evacuation, panic, looting, and
Table 8
The Appeal of Nuclear-Related Crimes to Potential Adversaries:
Summary Arranged by Adversary Type

<table>
<thead>
<tr>
<th>Adversary</th>
<th>High Appeal</th>
<th>Medium Appeal</th>
<th>Low Appeal</th>
</tr>
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<tbody>
<tr>
<td>Professional criminals</td>
<td>None</td>
<td>Threaten or carry out sabotage in connection with extortion</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Theft of non-SNM</td>
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<td></td>
<td></td>
<td>Theft of small quantities of SNM</td>
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<td></td>
<td></td>
<td>Theft of strategic quantities of SNM</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Threaten or engage in kidnapping or violence in connection with extortion or coercion</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Nuclear threats in connection with extortion or coercion</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Sale or attempted sale of nuclear material</td>
<td></td>
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<tr>
<td>Occasional criminals or opportunists--outsiders</td>
<td>Threats of sabotage in connection with extortion</td>
<td>Theft of non-SNM</td>
<td>Theft of information</td>
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<tr>
<td></td>
<td></td>
<td>Theft of small quantities of SNM</td>
<td>Theft of strategic quantities of SNM</td>
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<td></td>
<td></td>
<td>Threats against persons (in connection with thefts)</td>
<td></td>
</tr>
<tr>
<td>Occasional criminals or opportunists--insiders</td>
<td>Threaten or engage in sabotage</td>
<td>None</td>
<td>None</td>
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<td></td>
<td>Theft of non-SNM</td>
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<td>Theft of strategic quantities of SNM</td>
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<td></td>
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<td>Theft of information</td>
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<td></td>
<td></td>
<td>Misuse of facility</td>
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<td></td>
<td></td>
<td>Faking a diversion</td>
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<td>Disclosure of classified information</td>
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<tr>
<td></td>
<td></td>
<td>Nuclear threats</td>
<td></td>
</tr>
<tr>
<td>Adversary</td>
<td>High Appeal</td>
<td>Medium Appeal</td>
<td>Low Appeal</td>
</tr>
<tr>
<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Political terrorists</td>
<td>High-level standoff</td>
<td>High-level sabotage with radioactive release</td>
<td>Theft of strategic quantities of SNM</td>
</tr>
<tr>
<td></td>
<td>Low-level sabotage</td>
<td>Theft of non-SNM</td>
<td>Fabrication or detonation of nuclear device</td>
</tr>
<tr>
<td></td>
<td>Sabotage endangering human lives</td>
<td>Theft of small quantities of SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kidnapping or violence against persons</td>
<td>Dispersal of nuclear material</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Armed seizure of nuclear facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuclear threats</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antinuclear extremists</td>
<td>Low-level sabotage</td>
<td>Low-level standoff attack</td>
<td>Theft of strategic quantities of SNM</td>
</tr>
<tr>
<td></td>
<td>Trespass</td>
<td>High-level standoff attack</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incitement to illegal actions</td>
<td>Sabotage endangering human lives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disclosure, theft, or purchase of classified information</td>
<td>Theft of non-SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interference with transport</td>
<td>Theft of small quantities of SNM</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mass occupation of nuclear facility</td>
<td></td>
</tr>
<tr>
<td>Hostile employees</td>
<td>Theft of non-SNM</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>Theft of small quantities of SNM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low-level sabotage</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low-level standoff attack</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sabotage endangering human lives</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Armed seizure of nuclear facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass occupation of nuclear facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interference with transport</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>of nuclear fuels or wastes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Threaten or engage in violence against persons</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuclear threats in connection with extortion or coercion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9
The Appeal of Nuclear-Related Crimes to Potential Adversaries:
Summary Arranged by Crime

<table>
<thead>
<tr>
<th>Crime</th>
<th>High Appeal</th>
<th>Medium Appeal</th>
<th>Low Appeal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theft of non-SNM</td>
<td>Occasional criminals or opportunists—outsiders Hostile employees</td>
<td>Professional criminals</td>
<td></td>
</tr>
<tr>
<td>Theft of small quantities of SNM</td>
<td>Occasional criminals or opportunists—insiders Hostile employees</td>
<td>Professional criminals</td>
<td>Occasional criminals or opportunists—outsiders Antinuclear extremists Political terrorists</td>
</tr>
<tr>
<td>Theft of strategic quantities of SNM</td>
<td>Occasional criminals or opportunists—insiders Hostile employees</td>
<td>Professional criminals</td>
<td>Occasional criminals or opportunists—outsiders Antinuclear extremists Political terrorists</td>
</tr>
<tr>
<td>Low-level sabotage</td>
<td>Occasional criminals or opportunists—insiders Political terrorists Antinuclear extremists Hostile employees</td>
<td>Professional criminals</td>
<td>Occasional criminals or opportunists—outsiders Antinuclear extremists Political terrorists</td>
</tr>
<tr>
<td>Sabotage endangering human lives</td>
<td>Political terrorists Hostile employees</td>
<td>Antinuclear extremists</td>
<td></td>
</tr>
<tr>
<td>Sabotage with radioactive release</td>
<td></td>
<td></td>
<td>Political terrorists</td>
</tr>
<tr>
<td>Threats of sabotage in connection with extortion or coercion</td>
<td>Occasional criminals or opportunists—insiders Hostile employees</td>
<td>Professional criminals</td>
<td></td>
</tr>
<tr>
<td>Low-level standoff attack</td>
<td>Hostile employees</td>
<td>Antinuclear extremists</td>
<td></td>
</tr>
<tr>
<td>Crime</td>
<td>High Appeal</td>
<td>Medium Appeal</td>
<td>Low Appeal</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------------------</td>
<td>--------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>High-level standoff attack</td>
<td>Political terrorists</td>
<td>Antinuclear extremists</td>
<td></td>
</tr>
<tr>
<td>Faking a diversion</td>
<td>Occasional criminals or opportunists—insiders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misuse of facility</td>
<td>Occasional criminals or opportunists—insiders</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Armed seizure of a nuclear facility</td>
<td>Political terrorists</td>
<td>Hostile employees</td>
<td></td>
</tr>
<tr>
<td>Mass occupation of a nuclear facility</td>
<td>Hostile employees</td>
<td>Antinuclear extremists</td>
<td></td>
</tr>
<tr>
<td>Theft or disclosure of classified information</td>
<td>Occasional criminals or opportunists—insiders</td>
<td>Antinuclear extremists</td>
<td>Occasional criminals or opportunists—outsiders</td>
</tr>
<tr>
<td>Threaten or commit kidnapping or violence against persons</td>
<td>Political terrorists</td>
<td>Hostile employees</td>
<td>Occasional criminals or opportunists—outsiders</td>
</tr>
<tr>
<td>Trespass</td>
<td>Antinuclear extremists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interference with transport of nuclear fuels or wastes</td>
<td>Antinuclear extremists</td>
<td>Hostile employees</td>
<td>Professional criminals</td>
</tr>
<tr>
<td>Incitement to illegal action</td>
<td>Antinuclear extremists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dispersal of nuclear material</td>
<td>Antinuclear extremists</td>
<td>政治恐怖分子</td>
<td></td>
</tr>
<tr>
<td>Fabrication or detonation of nuclear device</td>
<td>Antinuclear extremists</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nuclear threats in connection with extortion or coercion</td>
<td>Occasional criminals or opportunists—insiders</td>
<td>Occasional criminals or opportunists—outsiders</td>
<td>Professional criminals</td>
</tr>
<tr>
<td></td>
<td>Occasional criminals or opportunists—outsiders</td>
<td>political恐怖分子</td>
<td>Antinuclear extremists</td>
</tr>
<tr>
<td></td>
<td>Political terrorists</td>
<td>Hostile employees</td>
<td></td>
</tr>
</tbody>
</table>
other associated disorders that would threaten public safety. Threats accompanied
by small samples of SNM, as might be obtained by criminal insiders, hostile em-
ployees, or political terrorists, could be especially dangerous, even if the adversaries
lacked the capability to deliver the massive destruction they threatened.

Although we did not compile appeals ratings for psychotic adversaries, it seems
possible that a functional psychotic working as an insider at a nuclear facility would
be capable of sabotage endangering human lives or armed takeover. This raises once
again the critical problem of the insider. Whether a hostile employee, an opportu-
nistic criminal, or a psychotic, the insider's special knowledge and access afford him
unusual opportunities to cause damage if motivated to do so. The need for vigilance
in hiring procedures, personnel reliability programs, and access control (e.g., the
two-man rule) cannot be overemphasized.

By listing crimes, even those rated as holding high appeal to specific adversaries,
we are not predicting that they will occur. Rather, they are crimes that adversaries
would be most likely to attempt if they decided to attack nuclear programs at all.

In some cases—the psychotic, the idiosyncratic adversary, the lone hostile em-
ployee—the decision to act would be peculiar to the individual. Actions by political
terrorists and antinuclear extremists, on the other hand, are more likely to depend
on the social and political context. The actions we rated as having high appeal for
political terrorists have already been committed elsewhere in the world; terrorists
have had both the motivation and the resources to carry them out. Should political
terrorists, domestic or foreign, target U.S. nuclear facilities, these are the types of
crimes one might expect. Fortunately, barring a general increase in levels of political
terrorism in the United States, such crimes do not at present seem likely. But the
times may change, and nuclear security officials should be prepared for any eventual-
ity.

Similarly, the more serious crimes rated as being of medium appeal and within
the capabilities of antinuclear extremists (e.g., sabotage endangering human lives,
mass occupation of an operating facility) would represent a major escalation on their
part. But changes in the political environment, such as revisions in the nuclear reg-
ulatory process to limit the rights of citizen intervenors, or a major nuclear accident,
could increase the probability of such actions.

Professional criminals are unlikely to be concerned with the political environ-
ment, but may be alert to promising changes in the economics of nuclear crime. They
might be stirred to action, for example, if the spread of nuclear energy programs
increased worldwide traffic in fissionable materials, and proliferation of nuclear
weapons created a lucrative market for stolen nuclear material.

It is a virtual certainty that low-level nuclear-related crimes will be repeated in
the future, but it is a different matter to predict actions for which there is no
precedent. In the worlds of both political terrorists and economically motivated
criminals, innovations in technique emerge and successful pioneering actions attract
imitators (as witness airplane hijackings and embassy seizures).

In short, it is impossible to forecast which potential adversaries will act, what
they will do, or when. Our analysis has achieved more modest objectives: It demon-
strates that the combinations of potential adversaries and crimes against nuclear
facilities probably exceed those facing any other type of installation, and it enables
nuclear security officials to plan their defenses with a clearer sense of what their
adversaries might attempt.
APPENDIX: SUMMARY OF ATTRIBUTES, CHARACTERISTICS, AND POSSIBLE ACTIONS OF CRIMINAL NUCLEAR ADVERSARIES
### Table A.1

Composite Summaries of Adversary Attributes and Characteristics Displayed in Six "Typical" Actions

<table>
<thead>
<tr>
<th>&quot;Typical&quot; Action</th>
<th>Number of Perpetrators</th>
<th>Weapons Used</th>
<th>Tools Used</th>
<th>Mode of Transportation</th>
<th>Technical Skills</th>
<th>Dedication (willingness to risk death or capture)</th>
<th>Inside Assistance</th>
<th>Planning</th>
<th>Ingenuity and Imagination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrorist assault</td>
<td>3-6</td>
<td>Handguns, automatic weapons</td>
<td>High explosives</td>
<td>Foot, commercial vehicles, air</td>
<td>Medium</td>
<td>High</td>
<td>No</td>
<td>Medium to high</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Robbery</td>
<td>3-6</td>
<td>Handguns, shotguns</td>
<td>None</td>
<td>Foot, commercial vehicles</td>
<td>Medium</td>
<td>Medium</td>
<td>Information</td>
<td>Medium</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Burglary</td>
<td>2-4</td>
<td>Weapons usually not displayed</td>
<td>Hand and power tools, high explosives</td>
<td>Foot, commercial vehicles</td>
<td>High</td>
<td>Low to medium</td>
<td>Information</td>
<td>High</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Bombing</td>
<td>1-2</td>
<td>None</td>
<td>Hand tools, explosives</td>
<td>Foot, commercial vehicles</td>
<td>Low to medium</td>
<td>Low</td>
<td>No</td>
<td>Medium</td>
<td>Low to medium</td>
</tr>
<tr>
<td>Sabotage</td>
<td>2-5</td>
<td>Usually none</td>
<td>Hand and power tools, explosives</td>
<td>Foot, motor vehicles</td>
<td>Low to medium</td>
<td>Low</td>
<td>Information and access</td>
<td>Medium</td>
<td>Medium to high</td>
</tr>
<tr>
<td>Commando raid</td>
<td>20-30</td>
<td>Automatic and light crew-served weapons, explosives</td>
<td>Hand tools, explosives</td>
<td>Foot, air, ship, and motor vehicles</td>
<td>High</td>
<td>High</td>
<td>Information</td>
<td>Medium to high</td>
<td>Medium to high</td>
</tr>
</tbody>
</table>

Table A.2
Typical and High-Level Composite Profiles of Adversary Attributes and Characteristics

<table>
<thead>
<tr>
<th>Adversary</th>
<th>Number of Perpetrators</th>
<th>Weapons Used</th>
<th>Tools Used</th>
<th>Mode of Transportation</th>
<th>Technical Skills</th>
<th>Dedication (willingness to risk death or capture)</th>
<th>Inside Assistance</th>
<th>Planning</th>
<th>Ingenuity and Imagination</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Typical&quot; composite</td>
<td>3-6</td>
<td>Automatic weapons, grenades, shotguns, explosives</td>
<td>High explosives, hand and power tools</td>
<td>Foot, commercial vehicles, limited use of aircraft</td>
<td>Medium to high</td>
<td>Medium to high</td>
<td>Information</td>
<td>High</td>
<td>Medium to high</td>
</tr>
<tr>
<td>High-level composite</td>
<td>12-20</td>
<td>Anything up to and including light, crew-served weapons</td>
<td>High explosives, power tools</td>
<td>Foot, commercial vehicles, air, sea</td>
<td>High$^a$</td>
<td>High$^a$</td>
<td>Information and help</td>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>


$^a$High dedication and high skill are not generally seen in a single "typical" group, with the notable exception of many commando raids.
### Table A.3
Possible Nuclear-Related Crimes, Based on Motivations Analysis

<table>
<thead>
<tr>
<th>Adversary</th>
<th>Acquire Nuclear Material or Information</th>
<th>Disrupt Nuclear Programs</th>
<th>Economic Motivation</th>
<th>Crises Not Involving the Security of U.S. Nuclear Facilities or Programs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Professionals</strong></td>
<td><em>Threaten or engage in sabotage in connection with extortion</em></td>
<td><em>Incite to illegal actions</em></td>
<td><em>Threats or engage in kidnapping or violence against persons in connection with extortion or coercion</em></td>
<td><em>Nuclear threats in connection with extortion or coercion</em></td>
</tr>
<tr>
<td></td>
<td><em>Threaten or engage in sabotage in connection with extortion</em></td>
<td><em>Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion</em></td>
<td></td>
<td><em>Nuclear threats in connection with extortion or coercion</em></td>
</tr>
<tr>
<td></td>
<td><em>Threaten or engage in sabotage in connection with extortion</em></td>
<td><em>Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion</em></td>
<td></td>
<td><em>Sale or attempted sale of nuclear material</em></td>
</tr>
<tr>
<td></td>
<td><em>Threaten or engage in sabotage in connection with extortion</em></td>
<td><em>Threaten or engage in kidnapping or violence against persons in connection with extortion or coercion</em></td>
<td></td>
<td><em>Sale or attempted sale of nuclear material</em></td>
</tr>
</tbody>
</table>

| **Political Terrorists** | High level standoff attack | Theft (all categories) | *Threats or engage in kidnapping or violence against persons* | Nuclear threats in connection with extortion or coercion |
| | Low-level standoff attack | Theft (all categories) | *Seize and hold a facility with (or without) hostages* | Detonation of nuclear device or dispersal of nuclear material |
| | Low-level sabotage attack | Theft (all categories) | *Trespass* | Fabrication of nuclear device |
| | High-level sabotage attack (?) | Theft (all categories) | *Incite to illegal actions* | Nuclear threats |
| | High-level sabotage attack (?) | Theft (all categories) | *(with hostages (??))* | Nuclear threats in connection with extortion or coercion |
| | High-level sabotage attack (?) | Theft (all categories) | *Incite to illegal actions* | Detonation of nuclear device or dispersal of nuclear material |

| **Philosophical or Religious Extremists** | High level standoff attack | Theft of SNM or nuclear weapons | *Incite to illegal actions* | Nuclear threats in connection with extortion or coercion |
| | High level standoff attack | Theft of SNM or nuclear weapons | *Threaten or engage in kidnapping or violence against persons* | Detonation of nuclear device or dispersal of nuclear material |
| | High level standoff attack | Theft of SNM or nuclear weapons | *Incite to illegal actions* | Fabrication of nuclear device |
| | High level standoff attack | Theft of SNM or nuclear weapons | *(with hostages (??))* | Nuclear threats in connection with extortion or coercion |
| | High level standoff attack | Theft of SNM or nuclear weapons | *Incite to illegal actions* | Detonation of nuclear device or dispersal of nuclear material |

| **Psychotics** | *(No action can be eliminated from the range of psychotic behavior)* | *(No action can be eliminated from the range of psychotic behavior)* | *(No action can be eliminated from the range of psychotic behavior)* | *(No action can be eliminated from the range of psychotic behavior)* |
| | High level standoff attack | Theft (all categories) | *Praika, hoaxes, bomb threats* | Nuclear threats in connection with extortion or coercion |
| | High level standoff attack | Theft (all categories) | *Fake a diversion* | Detonation of nuclear device |
| | High level standoff attack | Theft (all categories) | *Incite to illegal actions* | Nuclear threats in connection with extortion or coercion |

| **Hostile Employees** | High level standoff attack | Theft of non-SNM or small quantities of SNM | *Incite to illegal actions* | Nuclear threats in connection with extortion or coercion |
| | High level standoff attack | Theft of non-SNM or small quantities of SNM | *Trespass* | Detonation of nuclear device or dispersal of nuclear material |
| | High level standoff attack | Theft of non-SNM or small quantities of SNM | *(with hostages (?))* | Fabrication of nuclear device |
| | High level standoff attack | Theft of non-SNM or small quantities of SNM | *Hoaxes* | Nuclear threats in connection with extortion or coercion |

| **In Service of Foreign Government** | High level standoff attack | Theft (all categories) | *Engage in kidnapping or violence against persons* | Sale or attempted sale of nuclear material |
| | High level standoff attack | Theft (all categories) | *Engage in kidnapping or violence against persons* | Detonation of nuclear device or dispersal of nuclear material |
| | High level standoff attack | Theft (all categories) | *Incite to illegal actions* | Fabrication of nuclear device |


**NOTE:** ° = occurred
O = may have occurred
°° = not occurred

*There are no proven thefts of SNM. The ° refers to known theft of non-SNM.