

**THE PROBLEM OF LOCAL RESPONSE AND MITIGATION TO NUCLEAR
RADIATION DISPERSAL DEVICES (“DIRTY BOMBS”) AND SABOTAGE
INCIDENTS**

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ABSTRACT

The past two decades have seen the development of trans-national organizations of anarchists and terrorists whose sole function is to either destroy or disrupt the continuity of the political structures currently in place. Disruption of a system's infrastructure may be efficiently accomplished by utilization of one of two modes: physical-biological (biological, chemical, nuclear weapons) and computer system disruption and destruction (cyberterrorism). The most efficient disruptive device weapons would seem to be those associated with cyberterrorism.

The nuclear physical-biological devices are often generically referred to as “dirty bombs.” In nuclear parlance, the term is used interchangeably with the RDD (Radioactive Dispersal Device) acronym. A RDD is a combination of conventional explosives with radioactive materials; it is neither fission nor fusion nuclear device. The lethality of the radioactive material is variable, ranging from high level (e.g., spent nuclear fuel [SNF]) to low-level waste originating from medical, industrial, research, and power generation facilities. Devices of choice must be easy to deliver, moderately safe to handle, reasonably obtainable, technically simple, and not too costly. As a result, it is to be expected that the devices used will not use high-level waste but, instead, intermediate to low-level waste obtainable from disused sealed radioactive sources (SRS) and such low-level (GTCC) and intermediate-level (TRU) wastes as available. The purpose is to use the device to disrupt the system, hence the reference of weapons of mass disruption or hysteria (WMH) rather than weapons of mass destruction (WMD). Except for the potential panic and hysteria it delivers and the cost of the subsequent cleanup, RDDs are a relatively ineffective destructive device, except in the strength of the explosive utilized. This conclusion was reached in 1987 when Iraq used these devices.

Incidences involving RDDs would seem destined to occur. The question is, what will be the response structure prior to, during, and after the incident? Fortunately, most cities, as a result of chemical spills and the occasional biological spill, have at least a limited disaster plan in place. Traditionally, it has been the responsibility of the police and fire departments to react. Logically,

it makes sense that they do the same (with proper instruction) should an incident occur with a non-fission/fusion nuclear device. The problem is that while national and society response manuals are available, the individual characteristics of cities indicate that such can only serve as a loose set of guidelines.

Cities, regardless of size, may be characterized as provincial regional agglomerations of geodemographic villages, districts, barrios, etc. The city of El Paso, a largely bilingual city of over 700,000, is on the border between two nations. It is only the northern part of a 2.2 million metroplex when taken in combination with the 1.5 million of the Mexican city of Juarez. The two adjacent transnational and bicultural cities of the metroplex are separated from each other only by the intermittently dry, partially cement lined channel of the Rio Grande. These two cities form an amalgamated, international metroplex with a unique set of social, environmental, cultural, and political (national, state, and local levels) problems and benefits. Additionally, a growing population in New Mexico adds an interstate jurisdictional problem

Generically, the response to a nuclear incident should include: a clear and flexible chain of command, designated first-responders and their protocol, transportation control, hospital resources and response, management and treatment of casualties (injured, externally exposed, internally contaminated), public and governmental information dissemination, and clean-up and remediation of the incident area. The conclusion would seem to be that, with some general guidelines, each of the four major American Southwestern cities (El Paso, Tucson, Phoenix, Albuquerque) must formulate its own response to an incident.

The fundamental problem continues to be one of simple communication between the technical personnel, politicians, first-responders (police and fire departments), and second-responders (medical personnel and technicians). All of these entities must inform the public stakeholder. What is happening at any stage of a terrorist incident becomes the responsibility of the media to disseminate to the public. Inconsistency, irresponsibility, stonewalling, and political self-service must not be tolerated by any segment of the responsible parties or the media.

INTRODUCTION

The interface that exists between private and governmental organizations and their entities with first responders is of great importance when reacting to an event that may be classified as terrorism. Terrorism involves the disruption or destruction of a nation's infrastructure; four basic modes of terrorism are recognized as: cyberterrorism, chemical, nuclear, and bioterrorism. This discussion concentrates on nuclear terrorism; it is a form that can range, both physiologically and psychologically, from the least to the most effective mode.

The nature of this ongoing and future problem is illustrated by the media's breaking daily news reports. As an example, currently (late November 2004) surfacing in the public media there were reports of credible intelligence from an Al-Qaeda operative in Pakistan that this organization was considering moving nuclear materials into Mexico. These materials were then to be assembled and utilized to strike American targets. Another recent reported disturbing bit of information has been the theft of a crop duster plane. It was flown into Mexico; to date it has neither been traced

nor found. Such a plane would be admirably outfitted for the dispersal of lethal airborne biological, chemical, and nuclear aerosols.

However, the most disquieting information concerns the last two components of what has been referred to as the Axis of Evil, (Iraq, Iran, and North Korea). North Korea is a western Pacific problem. Of much greater importance is the continuing Iranian problem. In mid-November, three European Union nations (France, Great Britain, and Germany) stated that they had an agreement with Tehran to temporarily freeze its uranium-enrichment program. A week later the Iranians announce that they are in the market for ultracentrifuges. Ultracentrifuges, in a cascade of 1,500, are necessary to concentrate and enhance the necessary uranium radionuclide content (U-235) in order to develop weapons grade uranium (+90%). They are reported to be continuing a successful missile development program and are, apparently, in the process of modifying missiles to carry nuclear payloads. If these allegations are true, it would appear that the European Union involvement is for naught. The effectiveness of the United Nations, which should be deeply involved in defusing this, has been severely tainted by the reported activities of the Iraq Oil for Food Program. The International Atomic Energy Agency (IAEA), as an arm of the United Nations, has been questioned as to its reliability. It seems to be unable to effectively police nuclear rogue states or implement a nonproliferation policy. This impasse principally can be attributed to continuing internal Security Council and Assembly regional and global politics. It would appear that this international body of bureaucrats should continue to be considered to be inadequate until such time as it owns up to the responsibilities set out in the body's original charter. One deterrent for the continuation of the program may be the memory of the Israeli unilateral destruction of Saddam's nuclear facility at Ostrak, Iraq.

In the immediate future, the weapon of choice of nuclear terrorism would seem to be radiation dispersal devices (RDDs). This is the only efficient, effective, and deliverable device immediately available. The result is a weapon of mass disruption or hysteria (WMH), not a weapon of mass destruction (WMD). The effect of the device is psychological, environmentally damaging, and results in an extremely costly process of mitigation. The major sources for the radionuclides to be used are from sealed radioactive sources (SRS), transuranic waste (TRU), and greater than Class C (GTCC) low-level waste.[1] Spent nuclear fuel (SNF) would seem to be a less desirable source. The International Atomic Energy Agency [2] lists the primary (Category 1) radiation safety devices: Sr-90 thermoelectric generators, Co-60 and Cs-137 utilized in teletherapy, blood irradiation, industrial radiography, sterilization and food preservation irradiators, and Ir-192 industrial radiography devices. Ferguson and others [3] list the most susceptible radionuclides for RDD utilization as: Sr-90, Cs-137, Ir-192, Co-60, Am-241, and Cf-252. Co-60 (pellets) and Cs-137 (powder) in teletherapy devices are tied to serious accidents in the past.[1] The major problem to be solved in the case of the use of a RDD in a community is how the dissemination of information to the public will be handled.

The Department of Homeland Security is now the agency handling the work of the Immigration and Naturalization Service (INS), the Coast Guard, and the Customs Service. They have the responsibility of controlling the marine and terrestrial boundaries of the 48 contiguous states, Alaska, Hawaii, and the American territories. One of the most sensitive areas exists along the southern border between Mexico and the United States. On a practical basis, this boundary may be divided into three distinct geographic, demographic, floral, and faunal regions: the eastern

lower Rio Grande segment from the Gulf of Mexico to Big Bend National Park; the sparsely populated central Southwestern desert segment extending from west of Big Bend Park to the eastern boundary of California's coastal ranges; and the heavily populated Pacific Coast maritime segment extending to the ocean.

The central Southwestern border segment includes the Chihuahuan and Sonoran deserts. This region, since the twentieth century, has been the proven major southern gateway for the transient movement of contraband and illegal aliens. There are only four major metropolises in the region: Tucson, Phoenix, Albuquerque, and El Paso. The term metroplex could be used for all four cities in that they all consist of a central metropolitan core surrounded by densely to sparsely populated suburban areas. Reference to a city, used herein, refers to the concept of a metroplex, not the urban city core.

Each city offers its own specific set of problems. Some of the similarities that they share include: all are major hubs of rail transportation and interstate highway systems; they may have either associated military bases and installations; they all have major state and federal governmental agencies as well as major judicial, educational, and research entities. All of these cities have a highly trained and efficient infrastructure of local police and fire department personnel. These local municipal organizations are the designated first responders. However, each city has its own unique set of local problems, problems that cannot possibly be addressed in a cookie cutter "one response fits all" approach. Guidelines are very useful, but they must be flexible to be effective. Realizing that all four cities are different, the city of El Paso has been selected for this review. Any discussion of security in the southwestern desert boundary region and El Paso in particular must also address the problem of legal and illegal immigration.

Immigration

The immigration issue in the United States is a major one that has been reviewed in detail by Tirman.[4] He points out that annually about 31 million foreigners enter the United States. It is estimated that at any given time about 8.5 million of these individuals are unauthorized (e.g., those without visas or waivers, those who have overstayed their 90-day period, etc.). In 2000 over a thousand consular offices around the world issued some 7.1 million visas. The problem is fourfold: the long terrestrial and maritime borders; the large-scale welcomed labor migration; sizeable throngs of tourists; and students with visas. Essentially, the country has open borders.

The majority of the immigrants are the traditional types who came to take advantage of the opportunities available in the United States. In addition there are those who have been subjected to political and religious persecution and migrate to America for freedom from repression. These groups are among the best of our citizens. They are unlike the trans-national terrorist who typically lacks a social base in the nation state in which they reside. These are characteristically: non-state, non-national, non-territorial, dispersed, and remain in motion. Not infrequently these immigrants harbor great resentment for past transgressions. They are often the product of ethnic cleansing by forcible expulsion and/or genocide (examples from the last century could include the Kulaks of the former Soviet Union, the Armenian and Kurds by Turkey, the Arab Hadramis by the European powers, etc.).[4]

Weiner [7] recognized five basic categories of how migration and security are intermixed: (1) when refugees and immigrants organize against their homeland regime (Khomeini's successful coup of the Shah); (2) when they pose a risk to the security of the host country (Japanese-American detention in World War II, many of these were not immigrants); (3) when large influxes of migrants overwhelm the host country's language, self-image, customs, etc. (e.g., reaction to the Turkish minority in Germany); (4) when they create social and economic threats to the natives, particularly in employment and social services (Penn in France); and (5) when immigrants are used as weapons of war (hostages in Iran and Iraq).

Simply stated, terrorism is a process to install fear into a populace. In conflict terrorists are not treated in the same manner as either soldiers or guerillas as they focus their malice on noncombatants, including women and children. They are differentiated from soldiers and guerillas by their aim, which is the utilization of the slaughter of innocent victims as a means to heighten both outrage and fear. It would seem to be appropriate that they, and those who have equipped, trained, and supported them deserve no quarter, certainly not the Geneva Convention.

The majority of terrorist attacks have been directed at U.S. targets.[5] Tirman [4] links that fact to the advent of an economy tied to globalization. He lists three areas that have become critically important to the global anti-American attitude developed in the last several years. The first area is "Cultural Imperialism": the transmission of American values through television, cinema, music, dress, clothing, and other segments of popular culture that defies traditional mores. The second area is the "Marketization of Economics". This is viewed as the tentacle-like unequal interflow of capital markets between the major industrial nations and the emerging and third world nations. It is best illustrated today in former Soviet block eastern European nations and the developing countries (e.g., the economic and political relationships between former West and East Germany; France and the former French West African colonies). The last point of the globalization problem is Tirman's "Supranationalism". The modern ease of travel, communications technology, and the ease of movement of capital have substantially changed the global infrastructure. Utilizing al-Qaeda as an example, this organization is dispersed, migratory, non-national, financially opportunistic, and well networked, which makes them exceedingly difficult to track, uproot, and eliminate.[4]

The terrorists of today, according to a Department of Defense analysis, are the product of an age that has seen the collapse of the Soviet Union, changing motivations of terrorists, proliferation in technologies and their mass distribution, increase in information and information technology, and accelerated centralization of the vital components of the infrastructure.[5] President Clinton issued an Executive Order (13010, 1996) defining what critical infrastructures are necessary for the defense and economic security of the United States. The eight infrastructures cited would seem as valid today as they were at the time of their designation; they include: electrical power; gas and oil production, storage, and delivery; telecommunications; banking and finance; water supply systems; transportation; emergency services; and governmental operations. In relation to cyberterrorism, it should be noted that all of these infrastructures rely on computers, computer networks, and the internet.[9]

Terrorists, in most cases, nominally represent fundamental religious groups (Al Qaeda vs. western Christianity; Domsday Cults like Aum Shinrikyo), the victims of ethnic cleansing

(Armenians and Kurds vs. Turkey), or political dogma (European Red Army faction). The primary global organization for planning, coordinating, and implementing terrorism today is Al Qaeda and its immediate network of affiliates. It has been training recruits, establishing cells, and embedding sleepers since the nineties with an estimated annual budget on the order of 200 million dollars. The organization has ties to such groups as the Indonesian-Philippine Jemaah Ismiah (Bali nightclub bombing) and the most ruthless terrorist group, the Chechens (Moscow's Dubrovka Theater hostage crisis).[10]

Al Qaeda, of course, has a long, well documented record of seeking and planning to use nuclear weapons and materials. The past and current source of much of the global black market material has been the former Soviet Union's nuclear installations. Tied directly to this problem are the Chechen terrorists who have stolen materials from the Grosny nuclear waste facility in 2000 and radioactive metals (possibly plutonium) from the Volgodonskaya Nuclear Power Plant in 2001 and 2002.[10] The major black market supplier for global rogue governments and terrorist organizations has been Dr. A. Q. Khan's Pakistan operation that became exposed when a shipment destined for Libya was intercepted at sea.[10]

Nuclear materials utilizable in this region would seem to preclude the use of a sophisticated device like a thermonuclear (Hydrogen or H) bomb. Fission devices (Atomic bombs) are known to be designed in several hundred models; the estimated inventory has been set at 20,000 devices.[10] The basic components require either 35 pounds of highly enriched uranium (HEU) or 9 pounds of plutonium. HEU (+ 20% U-235) must be concentrated from naturally occurring uranium which is only 0.7% U-235. In order to concentrate the isotope, it must be physically separated from U-238 (99.3%). This separation, in part, is accomplished utilizing specially designed, highly sophisticated equipment such as ultracentrifuges that are manufactured in the West.

El Paso Metroplex

Cities are frequently provincial regional agglomerations of geodemographic villages, districts, barrios, etc. The El Paso - Juarez metroplex is an excellent example. These two cities are transnational and bicultural. There is a general tendency to think of the metroplex as solely being El Paso with its population of over 700, 000. The fact is that with the 1.5 million people living in Ciudad Juarez, it is a metroplex of 2.2 million with a set of unique social, cultural, political, and environmental problems on the national, state, and local levels. The two nations are immediately adjacent and separated only by the intermittently dry channel of the Rio Grande. The El Paso - Juarez metroplex represents one of the few places in the world where two foreign cities blend and truly flow together. Each urban area of the metroplex has its own official language, life style, political system, judicial code, custom service, etc., quite separate from the other. The metroplex is a major international and national rail and highway hub both east-west and north-south as well as being the international border connection. Both nations have numerous joint NAFTA industrial sites, transcontinental petroleum pipelines, trucking companies, manufacturing centers, critical service industries, and metal and petroleum refineries as well as separate international airports, etc. Additionally, El Paso is the seat of a major military complex. When these things are taken into consideration, it makes El Paso a legitimate target for nuclear terrorism.

Agreements made concerning the protocol and procedures in case of man-made or natural disasters are hindered in part by both nations' diplomatic bureaucracies. The reality is that in case a real incident occurs both parts of the metroplex will be affected. As an example, in case of emergency, the authorities in the United States are directed not to issue any announcements to Mexico. The Government of Mexico will act to issue any such warnings to its populace. The use of facilities, personnel, and equipment back and forth across the international border during such events as nuclear terrorism is not established.

Added to these trans-boundary international problems, a second interstate jurisdictional problem is present. Immediately west of El Paso there is an adjacent, rapidly growing population in southern Dona Ana County in the state of New Mexico. The original boundary between the states established in the nineteenth century was determined as the deepest part of the Rio Grande (thalweg) at that time. The river has since moved laterally, today finds parts of Texas that are on the New Mexico side and parts of New Mexico are on the Texas side. State codes can erect minor and major difficulties as well as unintended consequences. As an example, a number of years ago, a heart attack occurred in the field immediately across the state line at Mount Cristo Rey in New Mexico. It was not possible at that time to order a Texas ambulance to drive into New Mexico to deliver the patient to an El Paso hospital only 3 miles away. He had to be transported by a New Mexico ambulance with the nearest one being, at the time of the accident, some 15 miles away in Anthony, New Mexico. This, and numerous other problems like it, must be eliminated in times of emergency resulting from either natural or man-made disasters.

Incident Response

It is assumed that national to local level governmental entities are prepared to respond to not only natural but also man-made disasters. On the federal level this would be the Department of Homeland Security (DHS), Federal Bureau of Investigation (FBI), and Central Intelligence Agency (CIA). DHS now includes the former Customs, the Immigration and Naturalization Service (INS), the Coast Guard, and the Federal Emergency Management Agency (FEMA). FEMA coordinates the aftermath of an incident. The CIA has a responsibility of obtaining foreign intelligence. The FBI handles the crisis portion of nuclear terrorist incidents. It assumes jurisdiction under the classified Nuclear Incident Plan and the Chemical/Biological Incident Plan. State level entities in Texas operate in part under the Governor's Texas Association of Regional Councils in Austin. In far western Texas, including the city and county of El Paso, the Rio Grande Council of Governments handles the financial responsibility of the City-County operation.

The framework for incident response in Texas was established over a quarter of a century ago in Chapter 418 of the Texas Disaster Act of 1975. Texas, because of its great geographic spread, has had a long history of major disasters in the form of as hurricanes, major ship channel fires, tornados, etc. Consequently, because of the in-place legislation and experience, the result has been essentially an operation of fine-tuning to bring it into line with current levels of concern. The mayors of the cities in Texas represent the fundamental level of preparedness. In El Paso, crisis management operates and coordinates under the El Paso Fire Department. They assume, as first responders, the lead in the control of situations involving fire or chemical, biological, and/or nuclear hazards.[11] If the fire or hazard is determined to be a product of terrorism, the

FBI assumes jurisdiction. Law enforcement issues are handled under city police departments or the appropriate sheriff. Consequent requests for assistance go from the city mayor to the county judge, from the county judge to the Governor's Office of Emergency Management, and, if required, requests go from that office to FEMA in the Department of Homeland Security.

Bolz and others [5], in their text, have laid out the generic blueprints for tactics, procedures, and techniques to be utilized in case of terrorist incident. The heart of counterterrorism is the existence of a Community Defense Plan. The framework for an adequate Defense Plan lies in its organization. It must assign authority and responsibility at all levels. Personnel on all levels must know (from highest to lowest) whose orders to follow. Basically the Defense Plan reduces down to: establish levels of responsibility; form a chain of command; and, most critically, select carefully the individuals with decision-making positions. These individuals must have the ability to act under pressure. The point is, that during and immediately after an incident, the Crisis Command Center acts as the seat of power over the usual hierarchy. Chain of command in the crisis team must be as short and direct as possible. All the "players" should not only know the existence of a Defense Plan, but also be aware of what authority has what responsibility and what limits.

The plan should be published and distributed. Drills, quizzes, professional short courses, what-if analyses, are examples of activities that need to be taken by personnel. In the last month and a half of 2004, scheduled training taking place in El Paso included: a course in Core Disaster Life Support and two courses in Recognizing and Responding to Bioterrorism. In June of 2005 there will be a Weapons of Mass Destruction (WMD) functional terrorism class scheduled. It should be noted that in El Paso there is specific action being taken on radiological terrorism. The American College of Radiology considers the threat to be so serious as to publish a primer on disaster preparedness in response to RDDs. The primer is being introduced to every concerned professional (e.g., X-ray technicians); as they will be viewed as being expert, they must be prepared to respond to help manage an impending public reaction seeking either help or advice. The systems must be in place to effectively evaluate, triage, and treat those patients who are in need of care [12].

The crisis team (Medical [first Aid], fire, and evacuation) will require the assignment of specific tasks. Assigned individuals must not have conflicting multiple tasks; such a situation could very easily lead to serious problems. Individuals with two different functions cannot effectively execute their responsibilities simultaneously during a time of crisis. A generic problem of the Defense Plan is best exemplified by the recruitment of members of maintenance, janitorial, and cleanup crews. These individuals are often contract or part-time employees; therefore, they are not always available during times of emergency. Also, the facility evacuation team should include people of authority and wardens to handle staircases and exits during crises.

Defense plans against incidents are divided into three fundamental phases: pre-incident, incident, and post-incident. The initial pre-incident phase requires the establishment of what are the varieties, amounts, and levels of the potential risks. Once that has been assessed, a set of policies and procedures must be developed for implementation, with emphasis on adherence to procedures. The incident phase of the plan is basically an operations manual. It directs how and when specific actions are to be taken and, further, who should do them. Post-incident plans

includes everything that is required: assist representatives of authorized agencies in investigations; restore incident location to the point where normal operations occur; have good base data for long-term effects of the Defense Plan; and prepare the reports for evaluation of the Defense Plan's strengths and weaknesses with consequent improvement of the plan.

Terrorist attacks fall into four separate modes: assassination, kidnapping, hostage taking, and bombs. Kidnapping is separated from hostage taking by the fact that in kidnapping the identity of the perpetrator(s) is unknown. Kidnapping becomes hostage taking when the identity of the perpetrator(s) is/are revealed. Bombs, particularly vehicular I.E.D. (Improved Explosive Device) bombs, are currently the most favored (approximately 80% of all incidents). Apparently this is because they deliver an emotionally satisfying immediate, loud, spectacular, newsworthy violent result.[5] In the case of the nuclear devices, radiation dispersal devices (RDDs) are the practical choice. Another relatively constant feature of most terrorist incidents is that they are almost always planned to be simultaneous multiple events (e.g., the four 9/11 events). The purpose of this is to separate and render ineffective the defense plan's human and physical resources as well as the ordered sequence of procedures.[6.8]

Data to be utilized in assessment of the type, vulnerability, and ranking of targets are readily obtainable in public documents, published literature, and the ubiquitous internet. The extraction process can rapidly evolve into an embarrassment of riches requiring use of data mining. Targets, both human and physical, need to be examined not only by type but also evaluated as to how important is the resource in returning the system back to normal.

The agendas of the terrorists also need to be evaluated in the process of assigning and ranking targets. If the target has been the focal point of radical protestors involved in either supplying or receiving material from a targeted terrorist sources, it advances to a higher level of concern. Obvious human targets include those individuals that are either symbolically or strategically important (e.g., political, business, or religious icons). Municipal organizations (city halls, schools, etc.) and corporate complexes are also favored conspicuous targets. In all cases, maximum media coverage is the primary goal of the terrorist. Logically, infrastructure-sensitive areas such as financial institutions, companies with advanced technologies, energy companies, utilities, and companies operating in the emerging world (e.g., maquiladoras and twin plants of the border region) are obvious targets.

National Response Plan

The Department of Homeland Security (DHS) in January released the National Response Plan (NRP).[13] The report covers the full range of the complex, continually changing, interagency and multi-jurisdictional requirements, including: anticipation and response to the threats or acts of terrorism, major and lesser disasters (natural and man-made), and provides a basis for mitigation and long-term community recovery. The NRP develops a chain of command and a sequence of actions from local to state and tribal to the national level of concern. It provides the basis and routes for the declaration of an Incident of National Significance (INS), which requires DHS coordination. The National Incident Management System (NIMS) (March 2004) together with the NRP amalgamates the capabilities and resources of the governmental entities, non-

governmental organizations (NGOs), and the private sector into a seamless blueprint for domestic incident management.

The 28 page Nuclear/Radiological Incident Annex records 6 coordinating agencies (DoD, DOE, DHS, EPA, NASA, and NRC) and an additional 17 cooperating agencies. Response coordination to INS and other incidents includes: technical data management and protective action recommendation, as well as Public Information, Congressional, White House, and International data coordination. The Annex has provisions for such areas as victim decontamination and population monitoring and recovery. It has an imbedded advisory team for environment, food, and health. The concluding section of this Annex provides the chart for the responsibilities of the 22 directly affected entities. In conclusion, the National Response Plan in combination with National Incident Management System will form the basis for combating all phases of terror (e.g., cyber, biological, chemical, etc.) on the national level.[13]

CONCLUSIONS

The terrorists operate with a strategy of frustration and weakness requiring the employment of violence against non-combatants to influence others so as to achieve otherwise unachievable results. Their purpose is to set up a violent agenda with a calculated and anticipated incident resulting in a consequent knee-jerk overreaction.[15] Terrorism is effectively controlled by having adequate intelligence, media exposure, and an understanding of certain consequences. Security awareness of human and physical resources and the hardening of potential targets are the primary aims. Radiological terrorism, if employed, is most likely to be associated with RDDs as opposed to utilization of a fission or fusion nuclear device. RDDs attributing material is forensically traceable and, consequently, responsibility is assignable.[14] With a clearly responsive system in place, resultant retribution can be expected. The most effective grass roots level preparedness has been the volunteer-taught ACR primer for radiology professionals.[12]

The four major metroplexes of the southwestern United States (El Paso, Albuquerque, Tucson, and Phoenix), as earlier stated, present a series of tempting targets in view of their associated military bases; national laboratories; air, rail, ground transportation hubs; research and manufacturing facilities, etc. El Paso's experience in disaster emergency management may be categorized as being more mature in comparison to the New Mexico and Arizona metropolitan areas. Texas, because of the state's size, population density, and geographic location, has had a more frequent and continuous history of natural and man-made disasters (tornados, shipping and industrial accidents, hurricanes, etc.) than those encountered in Arizona and New Mexico. El Paso, of the four cities, has the major problem in preparedness in that it is amalgamated to Juarez, Chihuahua, of the sovereign nation of Mexico. All trans-border emergency procedures are subject of strict protocol and careful negotiation. The obvious fact that we are one metroplex does not solve the problem. Protocol and the multiple agencies and their levels of bureaucracy must be handled with diplomacy in order to work efficiently. The New Mexico-Texas interstate relationship has been discussed and is largely solved at this time.

REFERENCES

1. D. V. LeMone, "Sealed Radioactive Sources (SRS) and Greater Than Class C (GTCC) Low-Level Wastes: Potential Radioactive Dispersal Devices (RDD) Resources, Waste Management," Session 55, paper 2, Management of Spent and Disused Radioactive Sealed Sources, 15 p. (2004)
2. International Atomic Energy Agency, "Categorization of radiation sources," IAEA-TECDOC-1191, Vienna (2000)
3. C. D. Ferguson, T. Kazi, And J. Perera, "Commercial Radioactive Sources: Surveying the Security Risks," Monterrey Institute for International Studies, Center for Nonproliferation Studies, Occasional Paper no. 11, 55 p. (2003)
4. J. Tirman, "Introduction: The Movement of People and the Security of the State," in J. Tirman (ed.), The Maze of Fear, Security and Migration after 9/11, New Press, New York, 322 p. (2004)
5. F. K. Bolz, Jr., J. Dudonis, and D. P. Schulz, "The Counterterrorism Handbook," CRC Press, Boca Raton, Florida, 278 p. (2002)
6. D. Frum and R. Porle, An End to Evil, Random House, New York, 284 p. (2003)
7. M. Weiner, "International Migration and Security," West View Press. Boulder, Colorado (1993)
8. P. Herbst, "Talking Terrorism," Greenwood Press, Westport, Connecticut, 220 p. (2003)
9. D. Erton, "Black Ice: The Invisible Threat of Cyber-Terrorism," McGraw-Hill Companies/Osborne, Emeryville, CA, 273 p. (2003)
10. G. Allison, "Nuclear Terrorism: The Ultimate Preventable Catastrophe," Henry Holt and Company, New York, 283 p. (2004)
11. J. N. Kayyem and R. L. Pangi, "First to Arrive: State and Local Responses to Terrorism," MIT Press, Cambridge, Massachusetts, 239 p. (2003)
12. American College of Radiology, "Disaster Preparedness for Radiology Professionals: Response to Radiological Terrorism, ACR Publications, Annapolis Junction, MD, 44 p. (2002)
13. Department of Homeland Security, "National Response Plan," 417 p. (December 2004)
14. Charleton, W. S., et al., "Nuclear Forensics Technique for Attributing Material used in a Radiological Dispersal Device Event," 45th Proceeding of INMM, 8 p. (2004)
15. H. T. Hawkins, "Dealing with Fear Itself: the National Challenge," Proceedings of the Global 2003 Conference, p. 378-388 (2003)