# The Nuclear Emergency Search Team

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## Need for Remote, Mobile Radiation Detection

In the early days of the Manhattan Project, there was a need to be able to detect radiation so as to protect workers from exposure to nuclear radiation, and a number of detection devices were developed For the most part, they were hand-held units for examining workers' hands and feet or for searching limited local areas Some were affixed to doors and walls within the manufacturing plants where radioactive materials were being processed Subsequently, radiation detection instruments were used abundantly in the program to develop and test nuclear weapons.

Two events occurred that caused the national weapons laboratories and selected contractors to develop radiation detection instruments for mounting on moving and air vehicles the aircraft-weapons accidents in Palomares, Spain, January 17, 1966, and Thule, Greenland, January 21, 1968 At the time, it was perceived that the principal application of the new detection capability would be to define the extent of the radioactivity dispersed by accidents involving moving vehicles (aircraft or trucks) transporting nuclear weapons This purpose was to be accomplished by patroling the accident site with instruments mounted on aircraft or land vehicles That instrumentation was available in the early 1970s

A third event precipitated the establishment of the Nuclear Emergency Search Team (NEST) In May 1974, the FBI alerted the Atomic Energy Commission (AEC) to a reported terrorist threat in Boston The assistant general manager of the AEC for military application directed the manager of the Nevada Operations Office (NV) of the AEC to assemble appropriate personnel and instrumentation from the national laboratories and to transfer them to Boston via Rome, New York [1] Their purpose was to conduct a search for an alleged improvised nuclear device (IND)

At the time, the NV actually received a number of calls from Washington, D C , from several different sources Frequently the instructions given by one party were nearly the opposite of those given by another Amid this confusion, a group consisting of personnel with instrumentation from the Los Alamos and Livermore National laboratories and from the EG&G Company in Las Vegas, all under leadership of an official from the NV, was dispatched via commercial airline to Rome Air Force Base It took the group twelve to fifteen hours to assemble and travel to Boston Once there, the group was advised that the threat was a hoax and was instructed to return to Las Vegas

*Birth of NEST*

Based on the problems that emerged in dealing with the Boston incident (such as the conflicting instructions and the time required to pull a team together), late in 1974, the NV manager requested that the assistant general manager for military application assign him the mission, with appropriate authority, to organize a team of experts under his control to carry out future operations involving the search, identification, and rendering safe of any nuclear or radiation dispersal devices involved in a terrorist threat NEST was born early in 1975, initially with no publicity A nucleus for NEST-related activity was established within EG&G, which was assigned responsibility for overall development of the NEST logistics capability, including communications and technical support Specific volunteer personnel were identified at the three weapons laboratories (Los Alamos, Livermore, and Sandia), and an R&D program was instituted for the further development of NEST equipment Arrangements were made with the Military Airlift Command of the U S Air Force to transport the NEST team from Las Vegas to wherever deployment might be directed Training of the team and affiliated agencies became an important consideration

*Presidential Authority for NEST*

The establishment of NEST was acknowledged and authorized by executive order (EO) 11490 (amended by EO 11953), which assigned the AEC and succeeding agencies up to the current Department of Energy (DOE) the following emergency preparedness functions

Security of special nuclear material, fissionable material, nuclear weapons, or nuclear devices in the agency's custody

Coordination of search and recovery operations for nuclear materials, weapons, or devices

Assistance in the identification and deactivation of an IND

Provision of scientific and technical advice on radiation problems in the event of the detonation of an IND

Responsibility for the following tasks was given to the principal operating official of NEST, the NV manager deployment plans and procedures, on-scene command of the operation, logistic and communication support base, and scientific and technical support to agency headquarters, the Department of Defense, and other relevant groups These responsibilities are now under the ultimate authority of DOE

## Modus Operandi and Responsibilities

A threat message, oral or written, normally flows through police channels to FBI headquarters in Washington, D C , where, in concert with the DOE and affiliated laboratories and contractors, the message is evaluated as to validity This is known as the threat assessment phase [2] If the evaluation is positive, the NEST team is deployed on instructions from the DOE

A NEST operation involves several phases after the team has arrived on-site

1 *Search* Conducted, as appropriate, with fixed or rotary wing aircraft, unmarked vans, or personnel on foot seeking an unknown source of ionizing radiation

2 *Identification* Identifying the source of radiation, the outcome of a positive search

3 *Access* The ability to approach the object (IND) emitting the radiation This task might require the neutralization of booby traps or other devices that delay the team's approach to the IND

4 *Diagnostics* Determining the make-up of the IND, its component parts, the fissionable material contained in it, and the means to render it safe

5 *Render safe* Measures taken to preclude or limit the severity of a nuclear explosion

6 *Damage mitigation* Measures taken to minimize the damage and contamination should there be an explosion

7 *Clean-up* Action taken to clean up the debris if the IND detonates

In addition to the DOE, both the FBI and the U S Army Explosive Ordnance Disposal (EOD) teams have certain responsibilities during a NEST operation The FBI is to investigate threats or misuse of special nuclear material, provide for public health and safety, and handle public information

The army's EOD teams are to provide access for diagnostics and perform the render safe It is likely that the Federal Emergency Management Agency (FEMA) has also been assigned responsibilities during a NEST operation

*The First Training Exercise*

To test the ability of the team to conduct a search for a radioactive device in a public place and to do so surreptitiously so as to avoid public awareness and undue anxiety, as well as to test the detection capability of the team's newly devised equipment, which is housed inconspicuously in standard-looking briefcases, a field training exercise was held in the San Francisco International Airport in the summer of 1975 Three radioactive sources were hidden in luggage lockers at dispersed locations All were found within three hours, and the exercise was considered successful in accomplishing the objectives

*Strengthening NEST's Capability*

In November 1975, the NEST team was deployed from Las Vegas and from the laboratories to Los Angeles in response to an FBI request for assistance in locating a possible IND allegedly placed in one of Union Oil Company's facilities in Los Angeles The threat message, evaluated as positive, stated that a 20 kiloton device would be detonated unless a large sum of money (I believe it was $14 million) was placed at a specified location The team spent over forty-eight hours searching all possible locations, including refinery areas, storage tanks, shore-to-ship oil transfer locations, a large office building, and the home of Union Oil's chairman, but to no avail Subsequently the FBI arrested the perpetrator of the threat, who was tried and sentenced to six months in jail, the only such case to date

In June 1976, a month before the celebration in Washington, D C , of the bicentennial anniversary of the United States, concern arose over the possibility of terrorist activity during the celebration One response was the establishment of a limited capability for conducting NEST-type operations at Andrews Air Force Base, Maryland In December 1976, a decision was made to maintain NEST EAST on a permanent basis as a hedge against the time required for deployment of a full NEST team from Nevada (and the three weapons laboratories) in response to a terrorist threat in the eastern United States Although NEST EAST had only a limited radiation detection capability, it was considered to be a valuable asset, since it could effect a rapid response in the East while awaiting the full strength of NEST from the West

*The Threat in Spokane, Washington*

Almost one year after the threat against Union Oil Company, in late November 1976, the second principal nuclear terrorist threat arose in Spokane, Washington [3] This threat, as in the case of Union Oil, turned out to be a hoax, although this time a radiation dispersal device rather than an IND was cited in the threat message

Between 1977 and 1982, large sums of money were expended to upgrade the sophistication, sensitivity, and/or miniaturization of NEST radiation detection, communication, transport, and logistics support equipment and instrumentation The two major incidents for NEST had been hoaxes, no IND had ever been found Consequently, only phases 1 and 2 of NEST's operations (threat assessment and search) had ever been practiced [4] To make up for this lack of experience for the personnel involved in identification, access, and diagnostics, three additional training exercises were carried out using mock nuclear devices at Idaho Falls in 1977, at White Sands, New Mexico, in 1979, and at Los Angeles, with its police department, in 1981 A major command post exercise involving most of the cabinet agencies was conducted in Washington, D C , in 1982 The NEST group has also provided considerable training for FBI agents and members of the EOD teams and other elements of the Department of Defense

As more became known about the threat of nuclear terrorism, the need for extensive intelligence gathering to assist in responding to a threat became evident To that end, the then Energy and Research Administration (ERDA) entered into negotiations with the FBI and the CIA that resulted in agreements concerning cooperation in the intelligence arena for both domestic and foreign situations

## General Assessment of NEST Capability

NEST provides the United States with a valuable asset in containing nuclear terrorism through its ability to respond rapidly to threats and to discover devices There are, however, limitations to NEST's capability to find hidden and well-shielded sources of radiation For example, if an improvised nuclear device were hidden in a large metropolitan city such as New York or Chicago, with no further information on its location, it would be next to impossible for NEST to find it within a limited period If the IND were known to be in a specific area—say, vicinity of Times Square—the probability of its being discovered increases considerably

One of the stumbling blocks to a total discovery capability is the existence of background radiation, which exists to some degree nearly everywhere Thus, one goal of the R&D in radiation detection technology is to increase

the sensitivity of NEST equipment and thus overcome that problem In addition, the NEST research group inaugurated a program some years ago to establish the levels of background radiation in several U S cities and federal buildings This information is maintained in NEST's data base

## Suggestions for Consideration by the Task Force

The task force should consider several points First, is the current NEST configuration (with teams in Las Vegas and Andrews Air Force Base) sufficient? Should consideration be given to additional NEST organizations in other geographic locations in the United States, Europe, or the Pacific Ocean area? Second, is it feasible to establish a NEST team(s) on an international basis? Third, is there a mechanism other than NEST for searching for and identifying lost or stolen weapons, nuclear materials, or INDs? Finally, can the responsibilities of the International Atomic Energy Agency be augmented and complemented with authority to impose fines or sanctions when inspections disclose lax security?

## Notes

1 The Nevada Operations Office manages the underground nuclear testing program at the Nevada test site and is intimately associated with the three national weapons laboratories and with technical contractors involved in nuclear testing activities

2 In actual practice, the FBI would no doubt immediately evaluate the message as to credibility, and the NEST team would be placed on alert Between 1974 and 1980, a great number of threat messages were received, of which only eighty (approximately) were determined to be credible, of these, only two were given a positive assessment that resulted in the deployment of NEST

3 At least, during the period July 1972 through December 1982 when I was manager of NV

4 A major portion of the NEST team was deployed to the Northwest Territory to assist Canadian Forces in searching for the fallen Soviet satellite in January 1978 (Operation Morning Light) This effort provided the team with an incomparable training exercise from both the scientific and logistics aspects of its mission