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SANDIA NATIONAL LABORATORIES APPROACH TO EMERGENCY PREPAREDNESS

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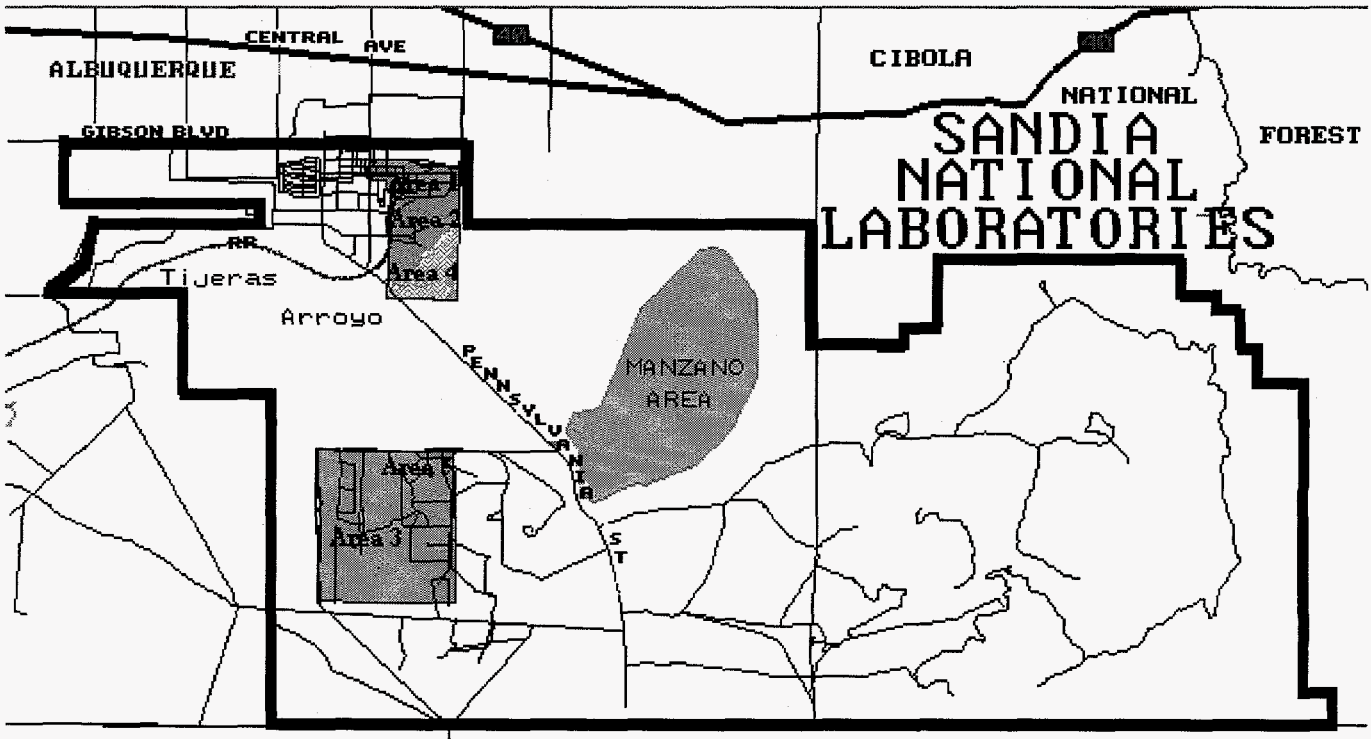

SUMMARY

Sandia National Laboratories (SNL) is located on Kirtland Air Force Base (KAFB) in Albuquerque, NM. The Air Force Base proper covers approximately 74 square miles in which SNL maintains five Technical Areas and the Coyote Test Field. These SNL areas add up to approximately 18,000 acres. However, SNL has other locations where we conduct corporate emergency planning. These areas include the Kauai Test Facility, located on the Pacific Missile Range Facility in Kauai, Hawaii, and the Tonopah Test Range, located near Tonopah, Nevada. SNL/California located in Livermore, California has an independent emergency preparedness organization for their emergency planning activities.

I. INTRODUCTION

SNL is unique within the National Laboratories arena because we are a tenant on a large military installation. Other Department of Energy (DOE) facilities are normally located within DOE owned property. This uniqueness originates from the Manhattan Project when SNL was located on Sandia Base, which was at that

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time about 10 miles southeast of the city of Albuquerque. Since that time both the air base and Sandia have evolved into the existing complex that now shares common boundaries with the city.

The SNL/New Mexico (SNL/NM) Technical Areas include Technical Area I, which is approximately 110 acres. Technical Area I contains administration areas, several labs, and fabrication shops. Technical Area II is located approximately one quarter mile due south of Technical Area I and was an explosive components research area. Technical Area II area is now entering an environmental restoration mode with the explosive research functions being transferred to a new facility located nearby. Technical Area III is an isolated area located about 3.5 miles south of Technical Area I and is used primarily for environmental and remote testing. This area is over 1,900 acres and contains a variety of labs, explosive facilities, centrifuges, rocket sled tracks and a radiant heat facility. Technical Area IV is located approximately three-quarters of a mile south of Technical Area I and contains research areas for pulsed power sciences and particle beam accelerators. Technical Area V is located approximately 3.5 miles south of Technical Area I and adjacent to Technical Area III. Technical Area V is a research area where hot cells and small nuclear reactors are located. The Coyote Test Field is the largest in physical size of all SNL/NM research locations. This area is primarily set aside to conduct a variety of explosive research projects. A major research function located in this area is the Solar Thermal Test Facility.

The SNL remote locations in Nevada and Kauai are used primarily for remote launch and drop testing capability.

II. BACKGROUND

The emphasis of this paper is on the SNL/NM emergency preparedness activities. Because of the uniqueness of the SNL/NM locations and operations, the emergency preparedness activities are dependent upon a graded approach to emergency planning. This is accomplished by using the DOE Hazards Assessment method identified in their published Emergency Management Guide.[1] The hazards assessment process has allowed SNL to develop both qualitative and quantitative emergency planning efforts.

Prior to the establishment of a hazards assessment process, SNL "winged" it when determining classifiable emergency thresholds and criteria. The emergency response organization (ERO) would apply a conservative and rather unjustifiable approach to emergency classification and emergency response. Consequently, under that style of emergency planning we applied a lot of expensive resources to such calamities as "murky" drinking fountain water. The "murky" water event tied up management and responders for over 4 hours.

Now with the hazards assessment process fully implemented, SNL/NM has identified approximately 25 facilities (out of over 800 buildings) located in approximately 18,000 acres that have the potential for a classifiable emergency. This DOE process has also caused SNL/NM to visit with KAFB personal, other air force base tenants, and the community at large, to identify potential hazards in their areas that could impact SNL.

Albuquerque, and KAFB have other potential off-site hazards that could impact SNL. For example, SNL is located near two interstate highways, I-25 (north/south) and I-40 (east/west). Both interstates are used to transport a variety of hazardous materials. In addition, a Class A railroad is located adjacent and parallel to I-25. This railroad carries enough hazardous cargo to create a concern for SNL/NM.

All types of hazards (such as natural phenomena, security related events, disgruntled employees, etc.) are considered in the hazard assessment process. They are normally applied to the scenario for the hazardous materials release from a particular facility. The DOE hazards assessment process allows SNL to develop a spectrum of events from which emergency action levels are developed. This process will provide the SNL ERO with an initial consequence assessment and initial event protective action recommendations.

III. SNL EMERGENCY RESPONSE ORGANIZATION

The SNL ERO has three levels of emergency response. The first and most important level are the building emergency teams that, like airplane pilots, are the first ones to the scene of the accident. The building emergency teams are knowledgeable of the hazards in the facility and are training and equipped to respond to certain levels of events.

The second level is an Incident Command System (ICS).[2] SNL uses an ICS because the 25 SNL locations with enough hazardous material to warrant emergency planning are scattered thoughout KAFB. Therefore, the ICS and Incident Commanders have to be mobile. With the publication of the hazards assessment documents and resulting emergency action levels, the Incident Commander has advance information regarding the potential severity of the event.

Part of the information the Incident Commanders have at their disposal is a "building profile". This profile incorporates the essential parts of the hazards assessment document. This will include the building hazards, corresponding emergency action levels, emergency planning zones, adjacent area populations, floor plans of the building, and other emergency related information. SNL is experimenting with a laptop information system using this building profile concept. The system is still in initial development.

When the Incident Commander arrives on the scene they connect with building personnel and assume command and control of the event at the scene. The Incident Commander can initially classify the event and request complete activation of the ICS to help them respond to the event.

The third level is the Emergency Operations Center (EOC). The EOC process is facilitated by an EOC Coordinator who is a member of the Risk Management Department with emergency planning duties. The EOC Coordinator will assist the Incident Commander in obtaining any resources they request. Additionally, the EOC Coordinator will initiate contact with the on-call SNL Senior Management Representative (SMR), DOE area office representatives, and SNL Public Relations personnel.

If the SNL SMR decides that conditions warrant, they will request the EOC Coordinator activate the EOC. In doing so, the EOC Coordinator will pull in additional personnel as necessary to support their EOC response efforts.

IV. EOC DECISION MAKING TOOLS

An issue for SNL has been the tendency of the EOC staff to micro-manage the emergency condition and the on-scene tactical response to the event. These senior management personnel, although they have complete confidence in the Incident Commanders, have had difficulty focusing on the more strategic issues associated with an event.

Over the past year, SNL has developed a process that will allow the personnel in the EOC to concentrate on larger response efforts such as continuing consequence assessment, establishing and maintaining contact with off-site authorities, making protective action recommendations, and performing initial recovery planning.

The process is used as a tool to move the EOC staff's thought process away from tactical response towards strategic potential problem analysis. In other words, to predict and recognize situations that require management involvement and action, and to avoid duplication of the on-scene response efforts. The four phased problem solving process provides smooth transition from event to recovery. This permits the EOC staff to intensify their efforts in effective management response to the emergency and leaves the hands-on work to the ICS.

The method employs four basic phases; Situation, Problem, Implication, and Need. Each of these phases will normally have their own section of the EOC white board space dedicated to recording relevant information.

The "Situation" phase is used to describe what has actually happened - who, what, when, where, etc. It is a factual description based on information known to have actually occurred. It answers the question - What happened? For example, if it were reported that a truck has overturned on a road belonging to SNL the "Situation" description would include the time, location, type of vehicle, and the fact that it overturned.

The "Problem" phase is used to describe the attributes associated with the "Situation" that are cause for concern. It is factual information about known characteristics of the event, that may or may not have actually occurred. It answers the question - So what? In the example, the situation that a truck overturned is not by itself cause for concern. However, there may be characteristics about the truck, its cargo, or the location that are problem areas. For the purpose of the example, one might identify problems such as the truck driver is injured, it is carrying

a hazardous cargo, the cargo is leaking, and the truck overturned on a main thoroughfare for site traffic. It is these conditions that cause the situation to be a concern for the EOC staff.

The "Implication" phase identifies potential event outcomes. It is predictive in nature and identifies things that have not yet happened but could happen if the problems continue. This begins to move the thought process from tactical to strategic in nature. It answers the question - What could be the result of the problems? In the example, one might identify the seriousness of the injuries, that the leaking material is running into a storm sewer drain, and that the time for the air base rush hour is approaching.

The "Need" phase describes preventative and contingent actions taken to avoid or minimize the identified problems and implications. This provides the focus for the efforts of the EOC staff. The on-scene tactical responders are responsible for mitigating the actual event and stabilizing the immediate situation. The EOC staff will focus on management oriented needs. For the example, this might include needs such as notifying the injured driver's family, notifying regulatory agencies of the release to the storm sewer, and communicating with site personnel to establish alternate traffic routes.

This method of gathering and organizing information in the EOC helps the staff to better understand the scope of the situation. Their efforts are concentrated on the needs and actions that can not be addressed by the ICS responders. SNL has found this to be a helpful tool in delineating the responsibilities between the tactical responders in ICS and the strategic managers in the EOC.

V. CONCLUSION

Because of the uniqueness of the site, Sandia has adopted a special emergency management style. The standard DOE "one size fits all" emergency management approach will not entirely work in our situation. Other DOE National Laboratories may be larger in size but the sites are wholly owned and controlled by DOE. SNL not only has a complex interface with local, tribal, and state government but has an added emergency planning coordination issue with another government agency who is our landlord landlord.

SNL has found an effective method to deal with the uniqueness of the different emergency management situations with both a physical mitigation method, the ICS, and an administrative method, using the situation, problem, implication, and needs technique. This method allows the Incident Commander to provide command and control of the event and allows the SNL senior management staff to provide the degree of oversight necessary to support the Incident Commander.

REFERENCES

1. Emergency Management Guide, *Guidance for Hazards Assessment,* U.S. Department of Energy, 6-26-92

2. *Incident Command System (ICS-120)*, Fire Protection Publications, Oklahoma State University, Stillwater, OK 74078

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