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Summary Document: Restoration Plan for Major Airports after a Bioterrorist Attack

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Summary Document:

Restoration Plan for Major Airports after a Bioterrorist Attack

(Includes Table of Contents, Overview, and Pre-Planning Summary)

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This summary report was prepared by Lawrence Livermore National Laboratory and Sandia National Laboratories.

The complete document is slated to be issued as a joint Department of Homeland Security and Environmental Protection Agency document, pending approval by those agencies.

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Overview

This document provides general guidelines for developing a Restoration Plan for a major airport following release of a biological warfare agent. San Francisco International Airport was selected as the example airport during development of the *Plan* to illustrate specific details. The spore-forming bacterium *Bacillus anthracis* was selected as the biological agent of primary concern because it is the most difficult of known bioterrorism agents to inactivate and is considered to be one of the agents most likely to be used as a biological weapon. The focus of the *Plan* is on activities associated with the Characterization, Remediation, and Clearance Phases that are defined herein. Activities associated with the Notification and First-Response Phases are briefly discussed in Appendixes A and B, respectively. In addition to the main text of this *Plan* and associated appendixes, a data supplement was developed specifically for San Francisco International Airport. Requests for the data supplement must be made directly to the Emergency Planning Operations Division of San Francisco International Airport.

This document does not describe public health responses to release of a biological warfare agent. If laboratory analytical results confirm the presence of a biological agent, the responsible public health agency involved in the response will commence appropriate public health actions, such as treatment (CDC 2004) and decontamination of potentially contaminated individuals, distribution of prophylaxis, and medical examinations. See the Centers for Disease Control and Prevention website for more information on emergency public health response (http://www.bt.cdc.gov/).

The concept of operations described in this document for addressing a *Bacillus anthracis* release at a major airport conforms to the *National Response Plan* (NRP) (DHS 2004) and implementation of the National Incident Management System (NIMS 2004). In most cases, a Unified Command would be formed to jointly direct the remediation process. The Unified Command would likely include the Airport Manager or Airport Emergency Operations Manager, representatives from state and local public health and emergency management agencies, and Federal agencies, such as the U.S. Environmental Protection Agency. The Unified Command and Incident Command Staff would ideally be co-located in an Incident Command Post in an uncontaminated area of the airport. If a release is large or complex, co-location of all key players may not be possible. If an Incident of National Significance is declared, a Principal Federal Official is appointed by the Department of Homeland Security to facilitate Federal support to the Unified Command. In some facilities and jurisdictions, additional response plans or procedures (such as BioWatch or other emergency response plans, procedures, or protocols) may govern notification and first response. Facility personnel, responders, and emergency management coordinators should be aware of all applicable plans and procedures and how to implement them.

Cleanups following the anthrax attacks of 2001 in the U.S. pre-dated the NRP and NIMS and did not make use of a NIMS Incident Command System as we know it today. Most Incident Commanders for the larger of those cleanups chose to convene a Technical Working Group (TWG) of multi-agency, multi-disciplinary, outside experts to advise in developing sampling and remediation plans. Most of the Incident Commanders also convened a separate Environmental Clearance Committee (ECC) to independently review pre- and post-decontamination sampling data as well as data on decontamination parameters, to evaluate whether the decontamination was effective, and to add credibility regarding a decision that it was safe to reoccupy

decontaminated areas. Use of such specialized technical expertise is strongly recommended, although it would now operate within the construct of the NIMS Incident Command System. The TWG, if convened, would act in an advisory capacity to the Environmental Unit within the Planning Section. Likewise, the ECC, if convened, would provide independent peer review of products and recommendations by the Environmental Unit. For maximum impartiality, the ECC could also provide recommendations directly to the Unified Command.

Activities addressed in this *Plan* commence with site characterization. The principal goal of characterization is to define the extent of contamination and to gather information needed to design the decontamination approach. Initial sampling data collected by first responders are assessed to approximate the location(s) of contamination. Confirmation of the agent type and viability is obtained from a Laboratory Response Network laboratory. Additional characterization data are collected to determine the extent of contamination and where remediation actions are needed. Areas suspected of being contaminated are contained and isolated to the degree possible to prevent further movement of an agent to uncontaminated areas or the environment, and to reduce the potential for future exposure from the agent or fumigant, if fumigation is needed. Agent air monitoring in areas adjacent to the contained contamination zones is done to ensure the protection of remediation personnel and to monitor any release from the contained zones. Various sampling approaches are considered. For example, wipe samples can be used to sample hard, nonporous surfaces. Swab samples can be used to sample nooks, crannies, joints, and seams. Appendix I is a template for preparing an incident-specific, operational characterization plan. Upon completion of the characterization plan, an internal review is initiated. Upon approval of the plan by the Unified Command, characterization commences.

The Site Safety Officer develops a Health and Safety Plan to ensure that coordinated health and safety measures are in place for all responding personnel. This plan describes physical, chemical, and biological hazards at the site, personal protective equipment, personal decontamination procedures, and emergency procedures to be used by sampling and remediation personnel.

An incident-specific Remediation Action Plan is developed, which describes the decontamination methods to be used and other details. Under NIMS, this overall plan, as well as other plans described below, are implemented through a series of standardized, shorter-term Incident Action Plans (IAPs), which describe specific activities that will take place during a shift or a day. The template in Appendix J is designed to facilitate preparation of the Remediation Action Plan. If fumigation will be done, a Sampling and Analysis Plan will be needed, as well as an Ambient Air Monitoring Plan, which can be a component of the Remediation Action Plan. These three plans are needed to obtain a crisis exemption from the U.S. Environmental Protection Agency for authorized use of an unregistered sterilant or pesticide during cleanup. If pesticide products become registered for inactivation of *B. anthracis* in the future, the three plans will likely be required by the product's labeling, but the plans would no longer be submitted to the U.S. Environmental Protection Agency for approval; rather, the Incident Commander would approve them. If fumigation is used, an Emergency Response Plan is also recommended, although such a plan is not required for a crisis exemption.

Remediation commences with source reduction, such as pre-cleaning surfaces to reduce the contaminant load. To expedite cleanup and prevent costs from escalating unnecessarily, a cost–benefit analysis should be incorporated in the decision process related to retention versus disposal of facility items and materials. Certain materials and structural components can be decontaminated for reuse, but it may not be feasible or cost-effective to decontaminate other

items. Those items must be pre-treated, packaged, with the package decontaminated externally, and removed for disposal as waste.

Site preparation includes sealing openings to prevent leaks and setting up equipment. Decontamination reagents and delivery systems are selected, and pre-testing all systems is done before carrying out chemical treatment(s). The important choice of decontamination technologies depends on characteristics of the agent, the nature and extent of contamination, and other site parameters identified during characterization. Decontamination-related decisions can have a major impact on waste-disposal costs, and it may be necessary to develop a disposal plan that identifies a means of disposal, necessary approvals, transportation, and other details.

A clearance strategy is developed to ensure that after decontamination, the risk of exposure to residual contamination is negligible. A clearance sampling plan is developed, which sets clearance criteria, specifies how to determine whether the criteria have been met, and describes how and where to collect clearance samples after decontamination. In most cases, clearance sampling includes both surface and aggressive air samples. Appendix K is a clearance plan template that identifies the types of required information.

To determine whether the decontaminated area may be safely reoccupied, the Environmental Unit (and the ECC separately, if one is convened) evaluates the results of clearance samples. For the anthrax incidents to date, remediation was considered successful only when there was no growth of *B. anthracis* cultured from any environmental samples taken after decontamination. Other factors that will be considered include the remediation process parameters (e.g., temperature, relative humidity, decontaminant concentration, and contact time) and the results from post-decontamination culture of biological indicators that may have been used during fumigation or sterilization processes. From such an evaluation the Environmental Unit or ECC, or both, recommend whether the area may be reoccupied, or whether further decontamination is necessary. The UC makes the final decision that a decontaminated facility is safe for reoccupancy. The facility owner makes the final decision to reopen a decontaminated facility.

A theme that is emphasized throughout this document is that many activities can greatly reduce the time required to re-establish airport operations if those activities are conducted prior to an actual release of biological warfare agent. A summary of specific resources (such as Federal, state, and local agency contacts; contractors; prospective team members; subject-matter experts; laboratory facilities; and other entities) that should be identified in advance by airport officials is provided in each pertinent section of this document, and summary contact lists of such resources are provided in Appendix L. A summary of overall pre-planning actions that should be completed by airport officials is presented at the end of this document.

Overview References

Centers for Disease Control and Prevention (CDC) (September, 2004), *Fact Sheet: Isolation and Quarantine; Fact Sheet: Legal Authorities for Isolation and Quarantine; and Questions and Answers: Legal Authorities for Isolation and Quarantine,* Department of Health and Human Services, Centers for Disease Control and Prevention.

DHS (December 2004), Department of Homeland Security, *National Response Plan*; available at http://www.dhs.gov/dhspublic/interapp/editorial/editorial_0566.xml

NIMS (March 1, 2004), *National Incident Management System*, document available from FEMA at 1-800-480-2520, Option 4, ask for FEMA 501.

5. Recommendations for Pre-Planning

As is emphasized throughout this document, many activities can greatly reduce the time required to re-establish airport operations if those activities are conducted before an actual BWA release. Recommended pre-planning actions by airport officials are summarized here by topic. Table 5-1 summarizes the principal pre-planning actions identified in all sections of this Plan, organized by the phase of activity with which an item is most closely associated.

1. Develop a concept of operations (CONOPS) for cleanup of a BWA release specific to the airport. The CONOPS should show the structure of the organizations involved in cleanup and identify their specific roles and responsibilities. Formation of a TWG, an ECC, and selection of members are strongly recommended before an incident occurs. Issues pertaining to local, state, and Federal jurisdictions should be addressed, and stakeholders should be identified. The steps in the CONOPS will depend on whether an Incident of National Significance (INS) has been declared, and may be dictated by the type of BWA used. The CONOPS should include two potential response scenarios for biological agents, one for Federal (INS) and one for nonfederal (nonINS) response. The CONOPS should also identify the pros and cons of a Federal versus nonfederal response. The CONOPS can be maintained in a Data Supplement. Identify alternative, backup locations for the EOC.

2. Ensure all facility information is readily accessible. Locate all architectural drawings of terminals, boarding areas, and other areas. Locate all mechanical drawings of ventilation systems, drainage systems, and associated mechanical rooms. All potential entrance and exit points for gases, particles, or liquids should be identified (such as sumps, drain pipes, vent shafts, and the like). The information could be summarized in a Data Supplement for quick access and initial planning. It is essential that legible and intelligible facility information be immediately accessible to remediation personnel. Consider placing the information on a geographical information system (with hardcopy backup) that would be controlled and maintained by airport personnel.

3. Identify containment zones to prevent the spread of BWA, and isolation zones to prevent the release of fumigant. Assess the facility layout and identify potential sampling, characterization, fumigation, and decontamination zones. Identify logical containment and isolation zones, and stipulate the means by which the zones are to be established. Isolation can be established at connector halls between major terminal areas. Fire doors can assist in isolation. Life-safety zones are used for smoke control and are often serviced by dedicated air-handling units (AHUs). Because they are defined by the AHUs of the airport HVAC system, they constitute logical zones for characterization and remediation. Decontamination zones are defined primarily by physical structures, such as fire doors or corridors that can be easily sealed in the event of a release.

4. Identify sampling and analytical resources. Determine who will collect samples, such as initial screening samples and subsequent characterization and clearance samples. Meet with the local LRN laboratory and discuss sample throughput, reporting of results, and surge capacity. If needed, line up additional LRN analytical laboratories that can be tapped in the event that many samples are to be collected.

5. Identify sampling zones and units. Identify logical sampling zones and sampling units for the airport. Decide how the airport can be logically subdivided to facilitate environmental sampling. Sampling zones may be similar to the containment and isolation zones, or they may be defined at a finer scale. It is possible that sampling zones and units may be different, depending on the agent released. However, it should be possible to construct sampling zones and units that could be reviewed and modified as necessary in the case of an actual event.

6. Identify the most likely decontamination methods and experienced contractors to be used. Evaluate the strengths and weaknesses of available decontamination methods. Select the most appropriate methods to use for different BWA attack scenarios. In some cases, it may be possible to use or upgrade in-house decontamination equipment. Identify staging areas or warehouses for equipment and supplies. Decide on the types and amounts of decontamination supplies needed and whether to purchase them in advance (some materials may have a short shelf life). Select potential contractors to employ as members of the decontamination team.

7. Identify what to decontaminate in situ, remove for offsite treatment, or remove for disposal. In most cases, easily removed and replaced items should not be retained, whereas structural components will be decontaminated in place. The decontamination reagent used will affect the decision of what items may be left in place. Whereas treatment in place should reduce the costs of the source-reduction step, critical equipment and items should be identified for removal and treatment offsite. If existing decontamination methods are not compatible with certain equipment, then identify alternative, backup, or replacement equipment.

8. Determine initial disposition of contaminated materials, and identify staging and storage areas for waste. Decontaminating materials in place will reduce the potential for spreading contamination, but it may also damage certain equipment or materials. Disposition choices should be evaluated in advance of an event. Estimate waste-storage requirements on the basis of quantities of materials that might require disposal, and depending on the decontamination technologies of choice. Initiate discussions with local waste-disposal facilities, including municipal waste landfills; construction and demolition debris landfills; hazardous waste landfills; and hazardous, municipal, and medical waste incinerators, if available. Discuss waste-disposal issues with the State solid-waste-management authority. Discuss wastewater management issues (e.g., wastewater from chlorine dioxide scrubbers) with local wastewater treatment facilities.

9. Write a new, generic Health and Safety Plan. Write a new HASP, or re-evaluate an existing one, on the basis of information provided in this Plan.

10. Identify backup facilities to continue commercial air service. In the event that one or more airport terminals is contaminated with a BWA, identify air cargo areas, hangers, and other infrastructure that might be used for the resumption of commercial air travel in some capacity.

11. Hold planning meetings at scheduled intervals. Airport personnel should meet with prospective UC and TWG members, responders, and stakeholders to continue to develop cleanup-related documents, policies, and guidance. Plans will change over time as technologies advance and local, state, and Federal policies evolve.

12. Conduct training exercises. Airports should identify the scope of training activities appropriate for responding to BWA scenarios. Activities can range from simple, internal notification drills to full-scale, mass-decontamination exercises that take place over one or more days.

Table 5-1. Summary of principal actions to be taken by airport authority decision-makers prior to a biological attack. Actions are listed under the phase of activity with which they are most closely associated.

Initial Notification and Policy Actions
• Develop a seamless notification protocol (such as a phone tree with predetermined triggers and prepared text messages) for all responders and agencies (Federal, state, and local) tailored to each stage of a developing incident. (See Appendix A.)
• Develop a policy statement specifying the criteria for airport closure or suspension of operations after a BWA attack.
Concept of Operations Actions
• Identify members of a Unified Command, convene the UC, and review this *Plan*.
• Identify members of a TWG. Members are drawn from the CDC, USEPA, local public health, sampling contractors, and analytical laboratories. The TWG should review this *Plan*.
• Conduct training exercises with likely command personnel, including TWG members and other responder and agency representatives.
• Identify alternative locations for an EOC and ICP, preferably near the airport, but offsite in the event that an onsite EOC is contaminated with a biological agent.
Characterization-Related Actions
• Identify characterization and remediation resources listed in Table 2-1.
• Identify potential sampling, characterization, fumigation, and decontamination zones within airport buildings.
• Identify sampling units.
• Identify areas at the airport that can be used or cleared for staging and storing waste materials.
• Make accessible all facility architectural and mechanical drawings, and update them as necessary.
• Periodically update HVAC blueprints and operating parameters.
• Periodically update building vulnerability assessments, and correct any deficiencies.
• Create a new or review an existing HASP.
Remediation-Related Actions
• Identify in-house equipment that could be used or upgraded for remediation activities.
• Select staging areas or warehouses for equipment and supplies.
• Determine likely decontamination method(s).
• Determine types of decontamination supplies to store.
• Select and retain contractors for the decontamination team.
• Determine initial disposition of contaminated materials.
• Identify staging and storage areas for waste.
• Initiate discussions with local waste-disposal facilities and wastewater treatment facilities.
• Discuss waste-disposal issues with State solid-waste-management authority.
Clearance-Related Actions
• Identify members of an Environmental Clearance Committee. ECC members should review this *Plan* and convene early, before characterization, if possible.