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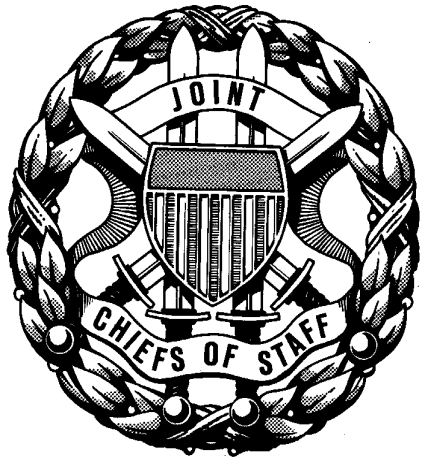
JOINT STRATEGY FOR BIOLOGICAL WARFARE DEFENSE



JOINT STAFF
WASHINGTON, D.C. 20318

CHAIRMAN OF THE JOINT CHIEFS OF STAFF INSTRUCTION

Directive current as of 18 November 2008

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JOINT STRATEGY FOR BIOLOGICAL WARFARE DEFENSE

References: None.

1. Purpose. This instruction provides broad guidance describing how the DOD agencies, unified combatant commands, and Services should plan, integrate, and provide biological warfare defense in support of the joint force. It creates an operational framework for military experiments and exercises. Once validated through experimentation, this strategy could result in doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) changes.

2. Cancellation. None.

3. Applicability. This instruction applies to the Joint Staff, DOD agencies, unified combatant commands, Services, and joint and combined activities.

4. Policy. The Chairman of the Joint Chiefs of Staff directed the development of the "Joint Strategy for Biological Warfare Defense."

5. Definitions. See Part II of the Glossary.

6. Responsibilities. See Enclosure C.

7. References. See Enclosure F.

8. Summary of Changes. None.

9. Effective Date. This instruction is effective upon receipt.

For the Chairman of the Joint Chiefs of Staff:

SCOTT S. CUSTER
Major General, USAF
Vice Director Joint Staff

Enclosures:
- A -- Joint Strategy for Biological Warfare Defense
- B -- Near-Term Implementation
- C -- Responsibilities
- D -- Biological Agent Effect and Prophylaxis Timelines
- E -- Technical Description of Biological Agents
- F -- References
- GL -- Glossary

DISTRIBUTION

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RECORD OF CHANGES

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ENCLOSURE A

JOINT STRATEGY FOR BIOLOGICAL WARFARE DEFENSE

1. Purpose. The purpose of this enclosure is to present a joint strategy for biological warfare (BW) defense to serve as the basis for revising existing biological defense doctrine, developing new doctrine, and implementing BW defense doctrine throughout the Department of Defense (DOD). This strategy supports implementation of the "National Strategy for Combating Weapons of Mass Destruction," the "National Strategy for Biological Warfare Defense," the "National Military Strategy for Combating Weapons of Mass Destruction," and DOD memorandum, "Preparedness of the US Military Installations and Facilities Worldwide Against Chemical, Biological, Radiological, Nuclear and High-Yield Explosive (CBRNE) Attack," dated 5 September 2002. This strategy provides an operational framework and principles to assist commanders and staffs to conduct military operations and provide force protection for any assigned or controlled forces against an adversarial use of biological weapons. Unlike chemical warfare, biological agents are divided into three major types (viral, bacterial, and toxins) and each major type needs a particular type of protection. Expanded information is included in Enclosure D. The principles of biological defense apply during peacetime, transition to conflict, and during conflict in the continental United States (CONUS) or outside the continental United States (OCONUS). This strategy for BW defense is organized under four operational elements: Sense, Shape, Shield, and Sustain. These four operational elements are not listed in any priority; they may be executed simultaneously, sequentially, or individually to maintain mission capability. There is significant overlap and intersection of these elements during planning and execution of BW defense, and each operational element consists of individual attributes (see Figure 1). Although the focus of this strategy concentrates on aerosolized biological agent defense due to its relatively greater threat to operational capabilities, it encompasses the broader spectrum of threats posed by biological agents. Covert contamination of food, water, and deliveries, etc., poses a significant risk to personnel, crops, and livestock.

a. Sense is the capability to continually provide information about the chemical, biological, radiological, and nuclear (CBRN) situation at a time and place by detecting, identifying, and quantifying CBRN hazards in air, water, on land, on personnel, equipment, or facilities. This capability includes detecting, identifying, and quantifying those CBRN hazards in all physical states (solid, liquid, gas) as well in biological specimens from infected personnel or through medical surveillance assets.

b. Shape provides the ability to characterize the CBRN hazard. This provides the force commander with a clear understanding of the current and predicted CBRN situation including casualty estimation and medical resource estimation, collect, query, and assimilate information from sensors, intelligence, medical, etc., in near real time to inform personnel, provide actual and potential impacts of CBRN hazards; envision critical Sense, Shield, and Sustain end states (preparation for operations); visualize the sequence of events that moves the force from its current state to those end states.

c. Shield is the capability to shield the force from harm caused by CBRN hazards by preventing or reducing individual and collective exposures, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment.

d. Sustain is the ability to conduct decontamination and medical actions that enable the quick restoration of combat power, maintain and/or recover essential functions that are free from the effects of CBRN hazards, and facilitate the return to pre-incident operational capability as soon as possible.

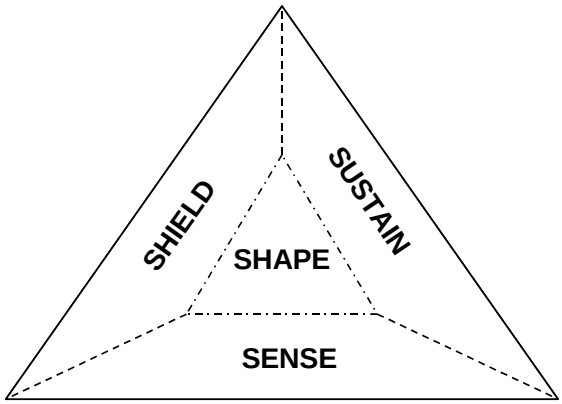

Figure 1. Operational Elements

2. Joint Strategy for BW Defense

a. For maximum effectiveness, a BW defense strategy should be standard among the Services and the combatant commands and should be well coordinated with other military and civilian entities. The strategy objective is to maintain and maximize mission accomplishment in the face of biological weapon attacks. While integrating fixes, this strategy requires joint standards, joint actionable criteria, and joint procedures for biological defense and biological attack warning. The strategy should be implemented through all levels of command. Implementation of the strategy's various operational elements and attributes may vary by level

of warfare (strategic, operational, and tactical), by priority, by resources, and by mission.

b. Biological warfare has enormous potential to negate military and civilian capability. This would have significant national, international, and public relations impact, as well as shake public confidence. The implications of BW defense are much broader than just defending military personnel. Biological agents used against military installations would expose co-located DOD civilians, contractors, and military dependents, as well as civilians and any non-US forces in the surrounding area. In today's threat environment, given US conventional military superiority, the most probable biological weapons use is a covert release, as opposed to use of standard military delivery systems (e.g., aircraft and missiles). Attacks on civilian targets are also likely and can have significant impact on military effectiveness without causing military casualties. These effects could range from loss of civilian facilities and imposition of quarantine to loss of infrastructure and industrial base. The sensing assets described below must be employed together in a layered approach to provide commanders with the most comprehensive understanding of the biological threat.

c. This strategy recognizes the contribution of counterproliferation actions such as active defense and counterforce operations but does not address them specifically. It also recognizes that, across the Services and combatant commands, there are many biological defense initiatives under way. Non-proliferation and counterproliferation plans and policies are an integral part of defeating the BW threat. These actions, normally in the purview of combatant commands, federal government agencies, and the senior political leadership of the country, are essential to all BW defense capabilities. The principles of this strategy are applied during non-proliferation and counterproliferation operations and impact all phases of military operations. Any actions that prevent the possible initiation of a biological weapon capability or mitigate the effects of an attack enhance the BW defense capability of the force.

3. Threats and Capabilities

a. The scale of a biological attack can vary from a biological agent employed as an assassination weapon against an individual; in food and water against a limited target; in a covert aerosol against a fixed facility; or to a long line-source, theater ballistic missiles, or other munitions. The primary threat to military operations is aerosolized biological agent, and the effectiveness of biological attacks can vary enormously. See Enclosure D for technical considerations. Access existing intelligence products or access the appropriate classified Web site, such as intel link, www.dia.smil.mil, for specific information.

b. Insight into the capabilities of potential opponents may be gained by examining the unclassified information about the now-defunct US offensive BW program. In 1942, a committee specifically designed to study BW concluded, "biological warfare was distinctly feasible…" This finding stepped up the research into offensive BW, which continued until 1969, when it was terminated through presidential mandate. In the 26 years the program functioned, several antipersonnel agents were developed, to include *Brucella suis*, *Pasteurella tularensis*, Q fever rickettsia, the Venezuelan equine encephalitis virus, *Bacillus anthracis*, botulinum toxin, and staphylococcal enterotoxin B (SEB). The agents were selected for their virulence and information was collected on human dosage, storage potential, and survival as an aerosol. Antianimal and anticrop agents (including rice blast and stem rust of wheat and rye) were also tested, although the antianimal research was short-lived, as it was considered not militarily relevant. The technology existed for mass production of the microorganisms and their products. Live testing of agent and non-pathogenic organisms provided information on agent dissemination, areas of attack, the effect of the environment on agents, building and terrain effects, and the ability to detect agent. During the same period, the United States investigated other diseases and agents but chose not to continue development into weapon stockpiles.

c. Since 1969, the level of available knowledge, education, and technology for the biological sciences and science in general has increased exponentially. The former Soviet BW program reportedly produced thousands of tons of the agents such as anthrax, small pox, plague, tularemia, glanders, Venezuelan equine encephalitis, and genetically engineered micro-organisms. The minimum threat capabilities this strategy addresses are those agents listed above from the US program, plus agents known in the Soviet program. In the decades since the cessation of the US offensive biological warfare programs, other nations and non-state groups have at least caught up to the 1960s US offensive capability and may have developed additional capabilities to modify, manufacture, and deliver agents that the United States or former Soviet Union did not weaponize.

4. Sense: To gain and maintain BW defense situational awareness. The attributes of sensing the battlespace enable biological defense situational awareness; situational awareness is essential for mission success. The attributes of sensing are aerosol background surveillance, meteorological surveillance, medical surveillance, epidemiological analysis and detection, medical diagnostics, laboratory analysis, intelligence, surveillance, and reconnaissance (aircraft tracks from air defense radars, perimeter surveillance, etc.), biological agent detector operations, sampling and handling procedures, and identification of biological

agents. Sensing specifically includes awareness of possible attacks against agricultural or other targets with high economic or psychological value. BW defense sensing should be established and maintained by commanders at all levels. Sense assets must be integrated with host nation coalition and allied sense capabilities.

a. Sensing requires the employment of biological detection devices, aerosol samplers, intelligence, radar, and other all source intelligence to maintain a common operational picture, as close to real time as possible, of any indicator of biological weapon use, as well as a worldwide picture of background events and environments that may hide or indicate biological weapon use. Data should be collected, processed, correlated, and reviewed to integrate multiple and unique indicators of biological weapon use, including medical and technical detection indicators. These data should be recorded and validated not only for current operational use but also for potential forensic use or for determining attack attribution. By employing medical surveillance assets, these centers should be able to differentiate endemic disease outbreaks from biological attacks. Depending on the level of command and the assets available, commanders may add centers, form centers within existing structures, modify existing structures, or implement fusion process electronically, etc. Ensure adequate laboratory capability exists in theater to support the volume of samples collected in support of both the biological surveillance and medical surveillance missions.

b. The attributes of sensing are detailed below. The sensing assets required range from biological detectors to epidemiologists, meteorologists, veterinarians, physicians, and specialized BW defense experts to unique intelligence and environmental collection systems, laboratories, and logistical support for systems, units, and personnel. Personnel assets also include appropriate liaison to and from other nations, other US government agencies, and state and local authorities, etc.

(1) Aerosol Background Surveillance is the process of gathering, recording, and analyzing data on the composition of the atmosphere. Detecting changes in the environmental background, such as the amount of organic and inorganic material in the air, to include an analysis of what type of biological agents may be indigenous to a certain AOR during certain times of the year, is and will be a fundamental component of current and future biological detection and identification capability. Therefore, the environmental background must be understood and defined to maximize the capability of technical detection and identification systems. Aerosol background data is required to support the implementation of detection plans within AORs and will

assist in determining detection strategies and tactics, techniques, and procedures (TTP) at the operational and tactical level.

(2) Meteorological Surveillance is the process of gathering recording and analyzing meteorological data. Meteorology is a significant variable in BW offense and defense planning. Meteorological conditions determine where and if an agent cloud will travel significant distances downwind. Changes in wind speed and humidity can change detector system performance; changes in humidity can change agent characteristics such as particle size or decay rate. Commanders and staffs should be aware of meteorological conditions at their level, and, as appropriate, the level above and the level below their commands. In addition to comprehensive real-time meteorology, detailed meteorological records should be maintained for post-attack analysis.

(3) Intelligence Reconnaissance and Surveillance must be conducted to provide BW defense information as well as the traditional output of such systems. Conventional indications and warnings (air defense attack warning, increased meteorological radar activity, etc.) should be collected and monitored as part of BW sensing. While not definitive, when fused with other data, such as current meteorology, this level of information can contribute to indications and warning of a biological agent release. Biological agents may be effectively delivered by almost any conventional military system. However, larger, longer-range systems such as aircraft and missiles produce far greater hazard areas than do small arms and artillery. Current information on aircraft flight paths, ship tracks, and missile paths may provide an indication of a biological weapon attack and the basis for initiating shielding. For example, an aircraft or a ship track perpendicular to the wind and upwind of the force may be a biological agent release indicator. Detectors may then be placed on a different collection schedule or forces may assume a higher physical protection level. As an example, currently Air Force doctrine tells all airbase personnel to take protection in the event of an enemy missile launch. Other installations or units may be directed to adopt the same doctrine given the short flight time for missile impact in AORs. Commanders routinely access and use all sources of intelligence, military and civilian; understand the process for establishing collection requirements and the sources of intelligence. However, biological defense requires more emphasis on medical intelligence and biological weapon delivery mechanisms.

(4) Biological Agent Detection Operations consist of the employment of biological detection devices. Current biological detectors are limited in number and capability. Once the operational and strategic vulnerability analysis is completed (see section (5)(a) below), employment of these limited assets may be planned for greatest operational payoff.

(a) Other considerations for detection include detector capability in the local environment, false alarm rate, the ability to perform further analysis and identification testing on alarms originating from detectors, forward positioning of detection assets in peacetime, and scheduling detectors in the strategic flow of forces.

(b) When a biological detection system indicates the presence of a biological agent, either by specific identification or by generic agent presence indicators, response must be initiated based on pre-existing criteria or decision points. Currently fielded biological agent detection systems are not real time and generally provide an attack indication after the attack is over or the cloud has passed the specific detector. Response times vary from as little as 20 minutes to more than a day depending on the detection system and the confirmatory process implemented. Standards for response should be established based on the type and number of biological detection system indications.

(c) Guidance must be provided on indications for action and what action to take. For example, to reduce false alarm rates, some users of current systems require two positive identifications before declaring a biological attack. Given the time lag of today's biological point detectors, commanders should consider individual or collective protection only for those units or personnel far enough downwind to benefit and prophylaxis or treatment preparation for those personnel in the area of assumed exposure.

(d) Sample evacuation plans must be developed and rehearsed. Lab support to detection and sampling units must be pre-identified and sample evacuation plans rehearsed. Having a smooth evacuation chain will ensure decision-making cycle time is reduced, giving the operational commander maximum time to react.

(5) Sampling and Handling Procedures is the process of collecting material from the environment or from personnel. Environmental samples will likely provide agent (the organism or toxin) along with growth media, fillers, natural background material, etc. Medical samples taken from exposed personnel will likely provide the organism, toxin, or markers of their presence.

(a) Reasons for sampling include characterization of the environmental background, identifying agents and/or diseases, guiding medical prophylaxis or treatment decisions, and providing senior political leaders with scientific evidence of a biological agent attack.

(b) Combatant commanders and Services should establish standard operating procedures (SOP) and provide resources for sample collection, preparation, handling, chain of custody, transportation, and processing. Where applicable, international agreements such as NATO's standardization agreements (STANAGS) should be implemented. Allied laboratories offer additional capabilities that the commander should consider. Non-NATO allies should be encouraged to adopt this standard as well. Guidance for sampling should be promulgated and implemented throughout the force.

(6) Identification of BW agents, for operational purposes, means specifying the disease-causing organism or toxin at the "disease level," e.g., anthrax, plague, SEB, etc. Identification is important for all aspects of BW defense because it is the start of effect characterization and the key to specific countermeasures. Currently, there is an informal hierarchy of identification within the Department of Defense. Current doctrinal terms for levels of analysis include "presumptive" used to indicate a field analytical result using a handheld device or biological integrated detection system; "confirmatory" used to indicate a laboratory identification from an Army or Air Force medical laboratory or Center for Disease Control (CDC) confirmatory lab; and "definitive" used to indicate a result from a national lab such as the CDC or the US Army Medical Research Institute of Infectious Diseases (USAMRIID). At each level of analysis a higher confidence in the result is achieved. Operational commanders should tie decision making to the level of confidence provided by the various levels of analysis. These terms should have joint, science-based definitions that provide commanders a level of confidence for decision making. Further, there should be guidelines or criteria for action based on this hierarchy. The Services and the combatant commands must consider standardizing technical detector identification and medical identification with the National Laboratory Response Network. Congruence between the military and civilian systems will avoid possible confusion and enhance both homeland defense and military-oriented biological defense.

(a) The definition of identification should be standardized. Because identification can come from multiple sources, medical and non-medical, the definition should be keyed to its source and should include such information as sensitivity and probability of false positive and false negative identification. Standards are necessary to provide information with a known confidence level that will assist commanders in developing criteria for response actions. A standard system for confidence in the detection and/or identification system must be established. This standard system can be developed from known test data for the fielded systems and can be adjusted as the systems gain

field experience. A general grading of reliability may be adequate such as Low, Medium, High.

(b) The identity of the agent in a sample, knowing where the positive sample was collected, and the time of collection and identification provide information beneficial to decision making. For example, if a technical detector indicates anthrax, there is some period of time to implement countermeasures. Additionally, since the agent and/or disease is known, the best available prophylaxis can be chosen, and disease-specific treatment preparations can be initiated. If the identification is for an agent that does **not** have prophylaxis available, alternative courses of action for mission accomplishment may be implemented and agent-specific personnel treatment regimes may be prepared. Laboratory assets are the most reliable contributors or enablers of identification. Within each AOR, there should be the capability to provide laboratory level confirmatory analysis within 12 hours of the end of the sample collection. Given the political sensitivity of some nations when addressing the transport and analyses of potential biological agent samples, a US military or other laboratory capability may be required in multiple countries within the AOR. Further, commanders and staff throughout the AOR should know the laboratory locations, contact information, capabilities, etc.

5. Shape: Minimize US Vulnerabilities to BW Agents by Influencing US, Allied, and Opponent Capabilities; SHAPE the Battlespace by Biological Defense Actions and Plans. Shaping is the command, leadership, planning, and intellectual aspect of biological defense and consists of these attributes: operational effects prediction, battlespace management, battlespace analysis, and integrated early warning. While this strategy specifically addresses how to shape biological defense, biological defense may influence the overall battlespace at the strategic and operational level. Shaping includes all aspects of national power (diplomatic, information, military, and economics). It is broader and more detailed in implementation than can be described here.

a. Battlespace Management:

(1) Intelligence Preparation of the Battlespace and Strategic and/or Operational Biological Warfare Vulnerability Analysis. All operations involve intelligence preparation of the battlespace (IPB). In the case of biological weapons, the Joint Staff should look at strategic mission accomplishment and how BW could be used to counter strategic success. More detailed vulnerability assessments to include food and water supplies are required at operational and tactical levels. Within a specific AOR, the effects of terrain, climatology, population

demographics, and time should be analyzed to determine potential impacts on mission accomplishment.

(a) These vulnerability and threat analyses should examine all facets of the operational plans, assigned and implied missions, and how, where, and when the mission accomplishment could be negated or disrupted by biological agent attacks. Examples could include the loss of an early deploying carrier or an attack on a CONUS facility, such as a force projection node, a satellite control center, or a long-range bomber base. It is important to note that some key operational facilities are not DOD controlled, but nonetheless require biological defense protection.

(b) As the combatant commands and components conduct their vulnerability analyses, the commands should coordinate with the Office of the Secretary of Defense (OSD) and Joint Staff to conduct an overarching review of operation plan (OPLAN) interaction, as well as other BW vulnerabilities of the national military strategy. This must be an ongoing process with a permanent BW red team in place to identify military vulnerabilities. An example of a red team's investigation might be the effect of biological agent release on the national and/or international civil air transportation system while the United States is conducting or preparing to conduct a major theater deployment.

(2) Commander's Guidance. The commander's guidance or intent is integral to military planning and operations. Commanders should have an understanding of how BW can impact their operations (e.g., agent effects, area coverage). The commander and his or her staff use that knowledge of BW weapon effects to support the military decision-making process. Commanders will require expert advice on operational and medical aspects of BW defense. The commander will have to critically assess and determine risk from BW. He or she must be able to understand the technical and medical implications of BW defense. Commanders, particularly at the operational level, will be required to provide guidance for BW defense operations across the Service components. Ultimately it is the commander who decides the level of BW defense and asset allocation. Specific examples that could be included in the commander's guidance are detailed in Decision-Making Criteria (see section (11) below).

(3) Planning. For biological defense, as with all other activities, planning is central to the successful initiation and continuity for all operations. Biological defense planning should be integrated throughout the planning cycle, taking into consideration threats and vulnerabilities. It is critical in addressing the logistical, medical, host nation, and coalition issues that will arise, and it should extend down

from the strategic and/or operational level to the tactical implementation level. Plans should include sufficient guidance to standardize BW defense operations, including medical operations, across the AOR and component commands. Depending on the AOR, both US and non-US forces, other government agencies, non-government agencies, and state and local agencies may have to be involved in BW defense planning and execution. Casualty estimation is a significant resource driver. Estimates of medical force structure and Class VIII requirements should be based on the most likely employment within the threat force capability as developed during joint intelligence preparation of the battlefield.

(4) Prioritization. While normally conducted in the planning process, prioritization is emphasized separately in this strategy because of the potential for disruption from a biological attack. While mission accomplishment priorities are not expected to change in a biological environment, operational and logistical priorities may. Specific BW defense medical and technical priorities for mission accomplishment should be established before the initiation of BW against US forces, remembering that such warfare can be delivered covertly by nontraditional systems. Priorities could include placement of medical and detection capabilities earlier in the time-phased force deployment list, augmentation or pre-positioning of medical supplies, and/or allocating air defense, additional ground security forces, or assigning biological detectors.

(5) Alternative Plans for Mission Accomplishment. In addition to planning for the implementation of biological defense measures, plans also should be in place to continue mission accomplishment and to assure a strategic force flow despite a degradation of capabilities due to a biological attack. Mission accomplishment contingency plans should begin with those entities (personnel, units, facilities, schedules) identified in vulnerability analyses and the potential effect of biological weapon attacks on those targets and on mission accomplishment. Once this has been done, alternative courses of action should be considered and plans developed. BW may require unit replacement of US or coalition forces, the use of alternative facilities, or the substitution of capabilities on a large scale; alternative courses of action also should address contingencies like the loss of allied or neutral bases or overflight routes.

(6) Readiness. Within the AOR and extending to supporting commands and the Services, BW defense readiness should be measured and reported. This readiness-reporting requirement may be combined with or integrated into existing procedures and/or systems or, if required, reported separately. What constitutes BW defense readiness should be defined and promulgated; for instance, readiness indicators

could include status of sensing capability, the ability to provide prophylaxis, the ability to treat biological casualties, and the status of BW defense personnel and equipment.

(7) Information Operations. Information operations (IO) are applied to all realms of combat and peacetime operations. Biological defense IO missions range from depriving an opponent of the capability to target biological weapons to depriving the opponent of any information on the effectiveness of an attack.

(8) Public Relations, Media Relations, and Information Management. Because of the uniqueness of BW and the associated fear, information management should be in place and information for public release should be prepared and standardized before any incident takes place. This includes risk communication, which is a function of command information and public affairs. It is imperative that risk information be properly communicated through all levels of the force. Information should be objective, consistent, standardized, and coordinated across the Department of Defense, other federal agencies, and with local, state, and other non-US national agencies. Information must be available to the force, to the United States, and to the public in the AOR. Commanders should implement DOD criteria and guidelines for what is releasable and when to release information. This element has the potential to reduce the number of worried well and psychological casualties that may present to the medical system by providing information to reduce fear, empower individuals to respond, etc.

(9) Education, Training, and Exercise. Implementing the strategy requires personnel specifically educated and trained in biological defense and the supporting academic disciplines, such as meteorology, medicine, and biology. All combatant commanders must have this expertise resident on their staffs. Once the strategy is implemented, it should be aggressively, realistically, and regularly exercised and translated throughout multi-Service and Service-specific doctrine.

(a) The Services have dedicated CBRN defense personnel, but the number of biological defense experts is limited. The Services and the combatant commands should establish requirements for BW defense experts and associated personnel, to include the number of positions to be filled, position and/or performance criteria, and requisite education.

(b) The Services and the combatant commands should ensure that adequate and realistic BW defense exercises are adequately resourced and conducted, and that BW defense is properly integrated into other exercises. Exercising responses to BW attack can be extremely

difficult; large numbers of personnel are required to act as patients or to support medical operations.

(10) Liaison and Communication. Liaison is a normally implemented military process; however, for biological defense, liaison, and communication requirements may be quite different. Many BW defense issues will be medical and may involve the DOD medical research institutes (USAMRIID, Naval Medical Research Center, and the Air Force Institute for Operational Health), the Department of Health and Human Services and its subordinate agencies (e.g., the CDC and the Food and Drug Administration (FDA)). Liaison for BW defense will call for special talents (infectious disease physicians, epidemiologists, etc.) and also will require language skills or translators. Because of the sensational nature and fear associated with BW, special liaisons and risk communication strategies may be required at the national political level, as well as with the media across the AOR. Care should be taken to ensure that organizations are not providing contradictory information.

(11) Decision-Making Criteria. Commanders must make decisions based on the specific situation involved; however, decision-making (or action-initiating) criteria should be established and standardized before any BW attack. Some of the more important decision-making criteria and related decisions commanders must accomplish include:

(a) Establish a set of standard definitions and performance descriptors for agent identification.

(b) Establish criteria for action based on epidemiological detection, the output of technical biological detection devices, indications and warning, identification of a BW agent, and confidence in the data.

(c) Determine warning and reporting criteria based on the health threat to personnel, the population in danger, and higher headquarters requirements. Consider notifying the installation populace, including tenet units, allied and host nation forces; higher headquarters; the local community and host nation (if applicable); the CDC and USAMRIID; and the media.

(d) Establish physical protection criteria based on mission accomplishment and risk and establish criteria for masking and unmasking.

(e) Maintain a list of approved and investigational new drugs (IND) as well as standard guidance for such issues as informed

consent. Develop AOR specific immunization requirements consistent with IND or emergency use authorization (EUA) policy.

(f) Maintain planning guidance on the availability, effectiveness, and potential side-effects of prophylaxis.

(g) Determine the requirements for prophylaxes, resource the capabilities to implement prophylaxis, and establish criteria for administration.

(h) Establish requirements for and capabilities to treat personnel at all standards of care, including personnel isolated due to contagious disease.

(i) Establish criteria for the initiation and extent of restriction of movement (ROM) and quarantine.

(j) Establish criteria for residual biological agent safety and contamination determination.

(k) Establish response actions authorized by level of command.

(l) Establish a priority list of units to protect when under attack.

(m) Develop mass casualty evacuation plans.

(n) Develop quarantine procedures.

(12) Before and during the decision-making process, commanders should realize that there always would be considerable uncertainty in a BW situation. Unknowns and assumptions should be explicitly specified. For example, the extent of the attack, the infectivity of the agent, and the effectiveness of prophylaxis and treatments all will be unknown to different degrees. More information will become available over time, allowing for refinement or reconsideration of actions; however, actions must be implemented early, taking into account this high level of uncertainty. See Enclosure C for time to agent effect, times to detect, and times for medical surveillance.

(13) Non-Proliferation and Counterproliferation. Non-proliferation and counterproliferation plans, policies, and actions are an integral part of shaping the environment. These actions -- normally within the purview of combatant commands, national level government agencies, and the senior political leadership of the country -- are

essential to the shaping process. Counterforce and active defense resources provide significant capability; these capabilities and the plans for their employment should be considered and coordinated with biological defense capabilities and plans.

(14) Special USTRANSCOM Considerations. Although the geographic combatant commands are guided by the requirements of their specific AORs, USTRANSCOM has uniquely broad concerns encompassing not only the biological defenses of each theater but also the health and safety standards of the United States, countries through which personnel and materiel must transit, and countries from which the United States requires overflight permission. In order to carry out the missions of moving personnel and equipment, USTRANSCOM will have to apply the operational elements and attributes of this strategy worldwide. This will entail especially broad coordination with all the combatant commands and the Services, as well as with US and foreign governmental agencies.

b. Integrated Early Warning:

(1) Across the combatant commands, a standard joint system of reporting suspected and actual biological attacks must be established, to include those subjects and circumstances not already covered by the OPREP-3 reporting system (reference CJCSM 3150.03B) and the NBC Warning and Reporting System (NBCWRS). The NBCWRS is the US doctrinal implementation of NATO Allied Tactical Publication-45B (ATP-45B). The NBCWRS is included in multi-service publication "NBC Contamination Avoidance" (FM 3-11.3). The commander must specify criteria for issuing warnings and reports, for the information required in them, for who issues warnings and reports; and to whom they should be sent. These criteria are based on sensing and determine the response actions required. For example, under current NBCWRS, the report of biological agent detection in one city or area of the AOR may not be forwarded throughout the entire AOR. Detection determined through medical surveillance and the output of epidemiological analysis (detection) must be used to warn the command but is not covered by NBCWRS. The threat of biological attack requires information normally found in the medical chain to be passed more rapidly to the operational chain and, in turn, operational BW defense information must be furnished to medical staffs. Information about instances of contagious disease may need high precedence operational distribution. While the combatant commanders may have such procedures, there is no overall standard. Further, within the AOR, this system must be capable of incorporating warnings from non-DOD and non-US sources as well as warning non-DOD and non-US organizations, e.g., local US civilian organizations, coalition allies, other non-allied countries, etc. The

OPREP -3 and NBCWRS address the need to exchange information between military and national civil authorities. However, there is no specific process detailed in the document and no supporting military doctrine addressing warning and reporting to civilian agencies at the local level.

(2) The ability to conduct warning and reporting requires a variety of actions based on level of command, available assets, expertise, etc. While the NBCWRS calls for the Nuclear Biological, and Chemical Collection Center (NBCCC), their warning and reporting role should be expanded. At the theater level, there should be a specified process to determine if an attack has occurred and a warning and reporting center for BW defense empowered to provide information to senior DOD leadership.

(3) Operational commanders determine the capabilities that their warning and reporting centers require. Based on the mission, the command establishes the means to obtain the required capability. The required expertise may be an onsite presence or through a reach-back capability. Geographic combatant commands require dedicated personnel across a broad range of expertise. However, centers are not necessarily a group of co-located personnel. An existing NBCCC or staff may be used or augmented to perform the required functions not covered under NBCWRS procedures. In some cases, the normal staffing process may be sufficient.

(4) The warning and report process should be held to strict security standards. Warnings and reports should be properly coordinated and protected. If used out of context or provided at the wrong time or to the wrong audience, they could adversely affect policy, resources, and politics. Some warning and reporting information could potentially assist an opponent in attack effectiveness analysis or provide insight on BW defense responses.

c. Medical Surveillance is the ongoing, systematic collection of health data through syndromic surveillance, clinical diagnoses, and environmental health surveillance. It is essential in the evaluation, planning, and implementation of public health practices; data should be collected and disseminated routinely and in a timely manner. For biological defense, rapid evaluation of medical surveillance data and reporting of analyses are required. The evaluations, decision-making criteria, and reporting of results are discussed as separate attributes below. As part of their routine operations, the geographic combatant commands, with their components, should conduct AOR-wide medical surveillance. Knowing the “background” level of illness is essential when looking for changes indicative of a BW attack. The medical surveillance

system should be standardized throughout the AOR and, to the extent possible, coordinated with existing US regional and national system(s) as well as those of other countries. At a minimum, input from non-US national systems should be collected and monitored as a source of medical surveillance. The medical surveillance system should provide timely information on the specifics of morbidity in the United States and allied force structure, the US population, and the population of other nations as appropriate to the AOR.

(1) Syndromic Surveillance is the collection of data concerning the signs and symptoms of patients who have sought medical care. These data are analyzed to identify abnormalities in the expected rates of illness, which may indicate a biological attack (see epidemiological analysis and detection). Given the capability of today's technology for detection and medical identification and the density of these assets, this surveillance may provide the first indicator of a biological attack.

(2) Clinical Diagnoses involves the identification of the causative agent of illness in individual patients. The extent to which these data will be available will depend on the health care providers' ability to diagnose BW-related illnesses. Clinical diagnoses information may be an indicator that a BW event has occurred and will assist in the determination of the extent of the attack. Clinical diagnosis may also be based on clinical laboratory analysis of patient specimens. Positive results must be transferred to commanders as soon as possible to allow operational commanders to more quickly develop the situation.

(3) Environmental Health Surveillance focuses on the non-aerosol risks from biological agents, including contamination of food, water, and other items that personnel regularly come into contact with. These potential routes of entry should be monitored on a regular basis. The Services currently field teams that can test air, water, soil, flora, and fauna for endemic disease hazards. Information from these activities and analysis or comparison of aerosol background surveillance data, specifically the biological agent background to Environmental Health and Safety (EHS) data should be fused with traditional biological weapons intelligence and information to provide a more complete biological hazard picture, as well as to guard against non-aerosol attacks.

(4) Epidemiological Analysis and Detection is the study and processing of data and/or indications provided by medical surveillance. This analysis processes medical surveillance data and determines when there are anomalies in the expected incidence of disease.

(a) Epidemiological detection – the outcome of the analysis – is the identification of a pattern of disease within a population that may indicate a biological attack. For the near future, epidemiological detection will be the most likely source of information on forces exposed to biological agents.

(b) The actions possible after an epidemiological detection are more limited than those taken after a technical detection, since operational reaction time is lost and some personnel are already casualties. Response options include prophylaxis for the asymptomatic, treatment for those exhibiting symptoms, and alternative courses of action for mission accomplishment. There will be a demand on the medical treatment system without the opportunity to prepare for the initial influx of casualties. In general, prophylaxis is ineffective for those personnel already showing signs of disease. As casualties are the first indication of a biological weapon attack in the case of an epidemiological detection, other units or areas may be protected by immediate prophylaxis, or medical treatment responses may be initiated.

(c) There should be standard criteria, common among the Services and the combatant commands, that define and determine that an attack has occurred based on epidemiological analysis of medical surveillance data. A common list of minimum criteria should be sufficient to allow effective decision-making. The more numerous and more complex the criteria, the longer the reaction time before response may be initiated, and the less effective the response will be.

6. Shield: To Protect the Force. Shielding encompasses those direct physical measures that prevent exposure of personnel to agent and/or disease and direct medical actions that prevent the occurrence of the disease. The attributes of shielding are; respiratory and ocular protection, percutaneous protection, collective protection, medical prophylaxis, evacuation, and conventional defense. The requirements to protect active military forces, family members, civilian employees, contract employees, etc., regardless of location and nationality, must be taken into account. This strategy supports implementation of DOD memorandum, 5 September 2002; "Preparedness of the US Military Installations and Facilities Worldwide Against Chemical, Biological, Radiological, Nuclear and High-Yield Explosive (CBRNE) Attack."

a. Respiratory and Ocular Protection. For biological agents, the primary goal of physical protection is the prevention of agent inhalation since, for most agents, inhalation exposure causes the most severe manifestation of disease. Exposed surfaces (nose, mouth, and eyes) also need protection as can be afforded by the personal protective mask.

(1) The criteria for donning military-issue masks should consider the threat, the source of the biological agent warning, meteorological conditions, the agent, and the mission risk. Recommendation for donning after epidemiological identification will be unlikely to be effective; donning after point sensor identification may have benefit, depending on meteorological conditions, position of detection, position of personnel, and the time elapsed between when the warning was received and when the individual masked.

(2) Standard doffing procedures after a biological attack are required. Doffing guidance should be developed based on source of warning, point(s) of detection, time since warning, unit position, etc. Criteria should be standard among the Services and the combatant commands, except for the incorporation of mission risk. Consider using a series of negative point detector or handheld results in conjunction with cloud arrival and duration analysis using ATP-45B as doffing criteria.

(3) Because individual protection also is the first response for chemical warfare and radiological warfare protection, donning and doffing procedures for chemical, biological, and radiological (CBR) defense should be coordinated across the Services and the combatant commands to ensure proper protection from all three threats, while at the same time avoiding confusion.

(4) Surgical masks are not designed to protect the wearer from aerosol attack, rather they trap orally expelled droplets and reduce the spread of communicable diseases such as small pox. Individual protection requires a military mask or commercial off-the-shelf (COTS) respirator designed to protect the wearer from inhaling infectious material. Surgical masks provide almost no protection against aerosol particles and thus are only useful for the prevention of person-to-person transfer of contagious diseases such as small pox and plague. Commanders may opt for DOD-approved COTS individual protection devices such as dust masks, surgical masks, etc.; if properly chosen and worn during an attack, these devices will reduce the level of exposure. COTS protective equipment will not prevent all causalities but, depending on the agent, may reduce the number of fatalities and the total number of affected personnel. The best respiratory protection is the standard military issue protective mask. The decision to utilize COTS masks requires further technical analysis to ensure adequate protection and to aid in the development of TTPs. At a minimum, a COTS mask must be National Institute for Occupational Safety and Health (NIOSH) approved and utilize a high efficiency particulate air filter (HEPA).

b. Percutaneous Protection: Percutaneous protection describes any means of preventing direct physical exposure to agent; it is composed of individual protection and collective protection. Traditionally, individual protection has been synonymous with mission-oriented protective posture (MOPP) gear. MOPP gear provides extremely good protection from biological agents. But the type of agent used may dictate a reduction in MOPP status.

(a) Physical protection, particularly individual physical protection, may degrade task performance, thus degrading unit and facility performance; the degree of degradation depends on the type of physical protection, level of training, acclimatization, duration of protection, work activity, and meteorological conditions.

(b) The IPB vulnerability analysis, when completed, will determine the physical protection requirements for those personnel, units, and facilities critical for mission accomplishment. For example, based on vulnerability and mission criticality, units or facilities that currently do not have collective or individual protection could be issued DOD individual protective equipment or provided DOD-approved COTS equipment to reduce exposure and risk.

c. Collective Protection. Traditionally, collective protection describes the prevention of biological agent entry into facilities, rooms, or vehicles. Collective protection systems normally provide filtered air with sufficient over -pressure to prevent agent seepage into the protected space; collectively protected facilities may utilize air locks and special entry-exit procedures.

(1) Unless the facilities collective protection systems are operational at all times, the issue of when to start and when to stop operating collective protective systems, or when to enter and when to exit such facilities, is paramount. The best way to avoid exposure is to operate collective protection continuously and have as many personnel in collective protection as possible. Given resource limitations and mission accomplishment requirements, the commander should publish priorities for collective protection installation and guidance for operation.

(2) Expedient collective protection (e.g., sheltering in place) should be considered. Sheltering in place uses knowledge of the protection level of buildings. Building occupants should be educated and trained on when to begin and end sheltering as well as when it is appropriate to close doors and windows, shut off or change heating, ventilation, and air conditioning systems, etc.

d. Medical Prophylaxis. Given the capability of biological weapons to cause mass casualties and the limitations of technical detection, medical protection will be the primary BW defense response. These protective measures should be planned, prepared, and, if possible, implemented prior to exposure. Resources for prophylaxis should be available within the incubation period of the specific threat agent.

(1) Prophylaxis refers to medical measures taken to prevent the occurrence of a disease; they may be administered pre- or post-exposure, depending on the particular agent and specific medical countermeasure(s). For example, the anthrax vaccine is a prophylaxis that should be administered pre-exposure. Ciprofloxacin, administered post-exposure but before symptoms appear, is an accepted prophylaxis for anthrax in conjunction with post-exposure anthrax immunization. Administering prophylaxis requires careful planning and preparation, for operational, logistical, medical, and legal reasons. Pre-exposure prophylaxis requires weeks to months to deliver full immunity. Implementation of vaccinations must be conducted as long as possible before deployment to an AOR with a specific BW threat. See Appendix B for graphics portraying information on the course of diseases and time windows for detection and prophylaxis administration.

(2) There is little data and no standard reference for the effectiveness of prophylaxis (how often the disease is prevented or to what degree symptoms are reduced). A joint standard defining prophylaxis effectiveness is required. Using this standard, each command should develop planning information that includes the expected percent of personnel casualties avoided given administration of prophylaxis, by time after exposure (one day, two days, etc.) and by agents relevant to their AOR from the Joint Chiefs of Staff (JCS) threat list. See www.dia.smil.mil.

(3) A list of approved drugs and investigational new drugs for prophylaxis of biological agent exposure should be centrally maintained by OSD and coordinated among the Services and the combatant commands. It is imperative that OSD and the Joint Staff maintain ongoing coordination with the FDA and other government agencies, as required, to reduce the administrative burden associated with executing an IND or EUA protocol in times of high operational tempo or extreme duress, thus ensuring the best and most timely information is available to the Services and the combatant commands who will have to execute prophylaxis. The CBDP Joint Program Executive Office will be responsible for submitting application for IND with the FDA. Plans should be in place that address all aspects of prophylaxis implementation, conform with the requirements for informed consent, state how much material is required, where it is stored, how

soon it can be administered, what the possible side effects are, what might be possible political considerations to US implementation, etc. Prophylaxis includes pre-exposure vaccination; given the threat of biological weapon use, the pre-exposure administration of an effective vaccine to the force enhances mission accomplishment, increases survival, and reduces logistical demands.

(4) For protection from highly infectious agents, restriction of movement or quarantine of exposed for potentially exposed personnel may be required. Ring vaccinations can be given to shield those in surrounding areas from becoming infected by the BW agent.

e. Evacuation. Historical precedent and procedures exist to evacuate family members and non-essential personnel from the combat zone or theater. Evacuation beyond the range of "conventionally" delivered (artillery, missile, and aircraft) BW agent is feasible. Evacuation in the face of a covert threat is a more difficult decision, particularly because of the intelligence requirements. Evacuating personnel from a CONUS facility based on "threat" will have significant public and political ramifications.

f. Conventional Defense. All aspects of conventional defense shield the force from biological weapon attacks; each aircraft or missile destroyed before reaching the target potentially eliminates a BW threat. Local security, physical security, and patrolling all deter covert releases or increase the chance of intercepting the release mechanism before an attack happens. Security forces, military and civilian, should be educated on BW agents and possible covert or field-expedient release mechanisms.

7. Sustain: To maintain or restore military operations. Sustain operations encompass those actions required to bring the force, or portions of the force, back to pre-biological attack capability. The attributes of sustaining are medical therapeutics, medical diagnosis, and decontamination (individual, equipment, and fixed site). Also included within sustain is restriction of movement and quarantine, individual and unit replacement, logistics, and mortuary operations.

a. Medical Therapeutics and Diagnosis. Medical treatment describes those medical measures taken when personnel show signs of illness. Treatments vary for different diseases; some diseases caused by biological agents have no specific treatments. Where there is no specific treatment to counter a disease, medical personnel treat to alleviate or lessen symptoms. Toxins, with the exception of botulinum, and viral diseases generally are treated symptomatically rather than with specific

medical countermeasures. Antibiotics are typically effective to treat bacterial infections.

(1) The military medical system has a dual mission: to maintain the health of the peacetime force, including family members and retirees, and to support the force in wartime by saving life and limb and, where possible, returning personnel to duty. The current medical force structure and procedures are based on historical trauma workloads and are not designed to support mass casualties from infectious agents or toxins. The requirements and the capability for treating patients at the various standards of care, in terms of required medical personnel, units, and material, should be determined. A successful biological attack will dramatically increase medical requirements.

(2) The capability to provide care and the standard of care provided should be balanced against the vulnerability analysis, available resources, mission accomplishment, and medical treatment requirements. Standards of care for biological agent casualties must be established and standardized throughout the AOR. Current military medical assets are capable of providing care to limited numbers of biological casualties, but the potential for BW mass casualties is so great and so varied that commanders must recognize that, at some level of resources, care must be constrained. Medical planners also should anticipate an increase in the "worried well" -- those persons who are concerned but are not suffering physiological or psychological effects of BW. Medical doctrine must specifically address the response to mass BW casualties.

(3) Once capability and planning requirements are determined, medical contingency planning should be initiated. At a minimum, plans should address the capabilities to treat personnel, requirements for force structure, evacuation policy and/or capability, restriction of movement, quarantine, and the resulting effect on mission accomplishment. Evacuation of personnel exposed to BW agents or potentially exposed to BW agents also may be a sensitive political issue as there is a generalized fear of BW. Non-US national and/or US state and local authorities may deny passage of patients through territories pending some assurance of safe passage, etc. Commanders may be required to maintain large numbers of casualties or potentially exposed personnel in theater (in medical facilities or transient facilities), increasing the demand for force structure and resources. Additionally, depending on the agents and course of disease, evacuation assets may be extremely limited due to requirements for specialized equipment, e.g., respirators onboard aircraft or limitations on contracted commercial assets to transport BW casualties.

(4) Additionally, medical facilities and/or units may require augmentation by non-medical personnel to provide non-medical support, laundry, cleaning, feeding, security, etc. Augmentation of medical assets should be factored into BW defense planning and other operational requirements. A further consideration should be the use of "in-unit care," defined as supporting sick personnel with food, shelter, sanitation, and medication (if available and feasible) without the supervision of medical personnel within the individual's assigned unit.

b. Decontamination. The decontamination attribute includes, individual, equipment, and fixed site decontamination. The issue of decontamination and risk standards are not new or unique to BW defense. Biological safety and exposure standards pose a difficult problem: the DOD standard should be acceptable and scientifically defensible in the United States and to other nations. Standards should be thoroughly coordinated and interwoven through the strategy to ensure all facets are executable.

c. Restriction of Movement (ROM) and Quarantine. ROM is a broad concept encompassing a number of measures for limiting people's movement to prevent or limit the transmission of a communicable disease. The measures that compose ROM may be used individually or collectively and include limiting ingress and egress to, from, or on military installation (in part or in whole), quarantine, and isolation. Commanders must use the least restrictive means of ROM available while ensuring protection of the public's health. The decision to implement ROM measures will be based upon multi-functional collaboration, and the combinations and/or types of measures employed will vary based on scope and severity of the situation. For BW defense, ROM refers to those policies, procedures, or actions commanders initiate to prevent the exposure of personnel by restricting their movement. Such restrictions may range from prohibiting personnel from visiting a specified country to the imposition of quarantine on a person, group, unit or facility.

(1) Quarantine is defined as the establishment of compulsory detention or other similar restriction, including isolation, to prevent or limit the spread of disease of individuals or groups reasonably believed to be infected with a communicable disease while the disease is in a communicable stage. Compulsory quarantine may also be established during the pre-communicable stage of a disease if the disease would likely cause a public health emergency if transmitted to other individuals. Compulsory quarantine of a facility or a unit poses a diverse set of challenges, from the national political level through the tactical level. Quarantine measures may be implemented in a number of ways

that provide the commanders with a range of options to limit the impact on operations.

(a) Home and/or dormitory quarantine may be suitable for contacts (i.e., persons that have come into contact with an individual with a suspected or confirmed infection) if it meets their basic needs and unexposed home members can be protected from exposure.

(b) Community-based facilities (e.g., billeting, bowling alley, fitness center and/or gym) may be appropriate for those contacts that normally reside in the dormitory or where home quarantine is not a viable option.

(c) Work quarantine may allow health care workers and other mission-essential personnel who have been exposed (but are asymptomatic) to continue to work with appropriate infection control precautions. When off-duty, personnel must return directly to home or community-based quarantine facilities.

(2) Commanders not only will have to establish and maintain quarantine, they also will have to deal with the political and public reactions and ramifications in their respective AORs. Contingency plans for quarantine should consider mission accomplishment, legal status of civilians in quarantine area, support for the quarantined areas or organizations, quarantine enforcement, and public relations.

d. Individual Replacement and Unit Replacement. The combatant commands, Joint Staff, and OSD should assess the requirement for replacements, individual and unit, in coordination with the Services. This action should be linked to the strategic vulnerability analysis, resources, and mission accomplishment.

e. Logistics. There is a logistical component to all elements of this strategy. Some attributes, such as biological detection operations and prophylaxis, may have special requirements for timeliness and storage and/or transportation conditions. For example, refrigeration may be required to maintain shelf life of pharmaceuticals. Medical treatments for mass BW casualties will create a logistical demand not routinely planned for or resourced. Additionally, conducting logistical operations in a BW environment may be constrained or complicated by medical and legal requirements in addition to the effects and risks of BW on logistical capability. Theater-level support requirements of subordinate biological detection and sampling units must be identified including maintenance of Biological Detection System (BIDS) sampling units, laboratory detection systems and re-supply of critical reagents, handheld assay kits, filters, and DOD sampling kits.

f. Mortuary Operations. Fatalities caused by BW have unique mortuary considerations. There is the possibility of negative public and other non-US government reaction to the handling and transport of these fatalities due to the fear of the unknown and BW in general. All commands, components, and agencies should have plans and resources to properly process, inter, and transport mass fatalities while considering operational necessity, human dignity, and family and public feelings and emotions. Consideration must be given to decontamination or sealing of infectious remains. Note any international agreements such as NATO STANAG, which addresses this issue for repatriation and overflight as well as infection control.

g. Risk Communication. Information must be disseminated to help Service members recognize the threat and protect themselves. Information must also be provided that specifies the signs and symptoms of infection. Identification of areas affected and not affected will reduce the stress of those not operating in the attack or hazard area.

h. Psychological Support. Psychological or pastoral care must be available in sufficient quantities to address the increase in the number of personnel expected to experience combat stress disorders. Without this capability, operational commanders can expect to see a further reduction in combat power beyond that caused by direct effects of BW attack.

ENCLOSURE B

NEAR-TERM IMPLEMENTATION

This appendix summarizes aspects of the strategy and is designed to apply to current operations. It recommends specific actions and criteria based on current BW defense capabilities. Commanders may use elements and attributes presented here; they are not directed or required. Within the Services and the combatant commands, authority to implement these measures should be identified. A current capability approach to biological defense and a chronology are presented below; specific actions then are presented. The key issues are planning, resourcing, and rehearsing of pre-exposure, daily, and post-attack activities.

1. Key Points

a. The importance of actions taken before the event cannot be overemphasized.

(1) Prior planning and rapid execution are imperative. Enclosure C contains approximate timelines for agent effects and detection (both technical and medical). These timelines should underpin planning efforts and may be used as a guide for timely decision-making on BW countermeasures.

(2) The importance of rapid response cannot be overemphasized. Commanders should use trigger events to help them identify biological events and to initiate rapid responses. While advanced preparation and planning is essential, defensive battle management operations begin when a commander recognizes one of four trigger events:

(a) Intelligence trigger occurs when a commander receives intelligence indicating that a biological event is imminent.

(b) Weapons trigger refers to a recognized, overt attack by a weapon system, such as theater ballistic missiles, sub-munitions, or artillery.

(c) Detector alarm trigger refers to a signal from a detection device or system indicating the presence of a biological agent.

(d) Sentinel casualty trigger refers to the medical community's detection of a biological event by assessing trends in the

physical symptoms of those reporting to clinics, or through the diagnosis of an index case.

(3) Actions may be implemented short of administering prophylaxis. In a worst case, even if prophylaxis is under way, it can be halted if there is a subsequent determination of no agent exposure or attack. However, since a decision to initiate or halt prophylaxis must be based on imperfect and uncertain data, standard criteria should be established to initiate prophylaxis in response to trigger events. Repeated initiation of prophylaxis based on false data erodes confidence in the BW detection system and increases the logistical burden on scarce medical countermeasures.

b. Large numbers of increasingly ill and dying personnel and the resulting degradation of operational capability likely will characterize biological attacks. Maintaining key military capability requires that units and/or facilities plan for and implement protective measures in advance of need. Effects of biological attacks can be mitigated by:

(1) Pre-exposure immunization, the use of collective and individual protection during the attack

(2) Prompt post-exposure prophylaxis.

(3) ROM to limit spread of contagious disease.

c. After release, biological agents cannot be seen and have no taste, smell, or other obvious signature. Moreover, because small amounts of agent can have widespread effects, BW agents are particularly suitable for covert dissemination. Currently, the only way to know that biological agents are present is through the use of point detectors. Several types of detectors exist, but all current detectors provide indication that an attack has taken place, rather than warning of approaching agent. Hence, current detectors cannot be used to initiate the use of individual or collective protection systems. For some agents, however, the indication an attack occurred is sufficiently rapid that post-exposure medical measures can be effective if implemented quickly. In the absence of detectors, the fact that an attack occurred will be apparent only when increasing numbers of individuals become sick and are diagnosed with agent-induced diseases. At this point, depending on the scale of the attack, it may be too late to preserve unit operational capability. Unit replacement or alternative courses of action are required for mission accomplishment.

d. A current capability approach to biological defense is outlined here:

(1) Identify and prioritize key units and facilities that must be protected from biological agents to help guide the allocation of resources.

(2) Plan against biological attacks. Planning encompasses use of detection systems, laboratory support, medical preparations, and determination of actions to be taken in the event of biological attack. Identify those events that would signal a biological attack occurred. For all units, but especially for those units for which prompt detection and protection might be lacking, prepare contingency plans in the event that a biological attack renders the unit non-mission-capable.

(3) Vaccinate or pre-treat all personnel against threat agents where such measures can be taken.

(4) Deploy and operate detectors at critical sites. Because of the covert threat, operate those detectors continuously as warranted by intelligence reporting.

(5) Conduct food and water vulnerability assessments and conduct continuous surveillance.

(6) Conduct medical surveillance and epidemiological analysis continuously. Disseminate medical threat information to primary care providers to create a high index of suspicion with the threat agents.

(7) Establish a BW identification laboratory capability to provide laboratory level analytical capability (e.g., polymerase chain reaction) within 12 hours of the end of the sample collection period.

(8) Ensure that post-exposure prophylaxes is available and can be applied to potentially exposed personnel within no more than 6 hours after detection, including the decision time to use them.

(9) Consider risk for critical units and facilities. Where there are no other options, consider work rest cycles of respiratory protection or continuously rotating some portion of the population into and out of protection.

(10) Be prepared to handle mass biological casualties, prepare medical contingency plans, exercise and rehearse the plans, and stock the required material.

(11) Train all personnel, military and civilian, on BW threats, consequences, and response plans.

(12) Prepare contingency plans for decontamination of casualties, personnel, and essential facilities and equipment.

2. Before an Attack. (This is a summary of actions taken before an attack. Planning, resourcing, and exercising these actions or procedures will allow immediate and more effective transition to after attack actions.)

a. Knowledge and People. Commanders should establish a core of personnel with the appropriate knowledge to plan and execute biological defense (including medical) and consequence management. Personnel should be assigned to the facility or the organization and be full-time, as opposed to part-time or additional duty.

b. Establish Current Biological Warfare Defense Capabilities. Commanders of installations and units should define their current biological defense capabilities; this includes the ability to determine an attack has occurred and to respond to such an attack. Ensure required resources are estimated to respond to an attack based on modeling and simulations of casualty estimates. Evaluation for consequence management should be conducted on the basis of assumed exposure for the personnel at the unit or facility, as required by reference (a). This assessment should be conducted for the agents on the JCS threat list that apply for the specific AOR and should establish criteria for requesting augmentation.

c. Threat, Risk, and Response. It is imperative to establish a threat and response process based on the capability to defend against BW, the mission, and acceptable risk. However, it is important to note that biological agents can only enter the human body through three major portals: the respiratory system, the gastrointestinal system, and the skin. The major defensive efforts are aimed toward assessing and mitigating the threats from aerosolized agents. Food and water supply, preparation, and services must be assessed for vulnerabilities. Responses should include alternative operational courses of action to replace functions, facilities, or units not operationally ready because of a biological attack. Traditional physical security measures should always be included in assessing and countering the risk of a BW attack.

(1) DOD threat assessments for biological attacks currently do not provide the detail required to address specific unit and installation vulnerability, e.g., the causalities or exposure from specific agent and munition combinations. Given this, BW defense options are extremely limited. However, commanders may have sufficient

intelligence warning of an immanent attack to implement defensive measures aimed at intercepting or otherwise preventing an attack. If an attack cannot be prevented, intelligence warning may allow commanders to heighten readiness postures if such warning is provided. At least in the near- and mid-term, it is unlikely that commanders will have advanced warning of and advancing biological cloud to protect most personnel before exposure. (Units and installations that are exceptionally large may be able to warn some personnel who are a great distance downwind, based on the reaction time of current sensors. See Figure B-1.) For installations or units with technical biological detection capability, the determination of detection duty cycle and risk is imperative. Current technical detection capability will, at best, provide after-the-fact exposure information. For small installations, i.e., a facility 3 km by 5 km or less, assuming collective or individual protection is of much lesser value after an attack has been determined. However, for a large deployed formation such as an Army Corps or Marine Corps Expeditionary Brigade, a warning from detection that results in assuming protection may avoid or at least reduce exposure levels.

(2) For small installations and facilities, there are very few sets of meteorological conditions that would negate a biological attack. There is no current method to determine the meteorology and attack characteristics (type release, agent, decay rate, etc.) combinations that could negate the effectiveness of a potential biological release. If the commander estimates that the risk of biological attack is significant enough to employ a detector, then all detectors available should be employed; and if detection operations are warranted, all collective protection systems should be employed. Reducing the number of functioning detectors at any installation, even in non-optimal meteorological conditions, only decreases the chances of detection.

(3) If the risk of personnel degradation is considered unacceptable, commanders should consider masking personnel by shift, or continuously rotating some portion of units or facilities personnel in masks to retain mission capability. Military issue masks, when properly fitted, provide sufficient protection. COTS masks, depending on the type and fitting, will reduce exposure provided a NIOSH approved mask and HEPA filter are used. Until a list of DOD-approved COTS material is available, DOD standard issue CBR protective masks provide the best respiratory protection in any operational CBR defense effort. When commanders opt for COTS masks, the masks should have a protection factor of at least 100. Dry agents and highly infectious agents demand higher protection factors. For installations or units without technical detection, with the exception of collective protection and shift or continuous masking, BW defense response is limited to medical surveillance and consequence management. Surgical and paper-type

dust masks provide little if any protection (protection factors are typically 2-4 against agent-sized aerosol particles. Surgical masks are only appropriate where their use helps protect those not already infected (that is, person-to-person spread of small pox and other communicable diseases.) Low-cost COTS respirators (e.g., NIOS rated N-95) if fit-tested provide some protection against agent-sized particles. The levels of protection provided by this type of mask may reduce casualties from poorly executed attack or attacks with low toxicity or low infectivity agents. However, analysis has shown that these levels of protections (protection factors ~100) are inadequate for the majority of personnel likely to be exposed from a deliberate effective bio-aerosol attack. Only the fit-tested military mask or an equivalent (expensive) COTS respirator provides adequate protection against the wide range of possible BW aerosol attacks.

(4) For units, installations, and facilities without biological detection capability, planning and preparation for consequence management are the best near-term courses of action. Commanders should always assume that BW agents can be used covertly and successfully to attack their units or facilities.

d. Prioritize. Based on assigned mission, commanders of installations and units should prioritize BW defense to provide maximum mission accomplishment when resources are not available to prevent 100 percent exposure, or to provide 100 percent prophylaxis and treatment in a consequence management response. Prioritization also should include continuity of command and control, maintenance of biological defense capabilities, and the continuation of essential services. At operational levels, prioritization should focus on mission accomplishment and support of the attacked units.

e. Prophylaxis. The best existing method of prophylaxis is immunization. Where an immunization exists against potential threat agents, it should be applied to all personnel. The Services and the combatant commanders, as appropriate, should plan for, preposition resources for, and have the ability to initiate prophylaxis for agents or diseases within 6 hours after detection of a biological attack. Even though detection currently will not provide warning to prevent exposure, it will provide sufficient warning to administer prophylaxis for bacterial agents with prior preparation and stockpiling. When feasible, an attempt at laboratory confirmation should be made when warning is based solely on field detection systems. If BW casualties occur, then initiation of prophylaxis should be immediate. For those units without detection, or for attacks below the sensitivity level of the detectors, casualties will be the first indication of an attack. When this occurs, an especially rapid response is required; therefore, a 6-hour criterion is chosen.

f. Investigational New Drugs. Though approved for treatment, the FDA has not yet approved the prophylactic use of some drugs; it is considered "off label use." Further, some other medical countermeasure may be investigational and not yet FDA approved. EUAs are another mechanism to administer non-FDA approved vaccines in the event of a declared emergency. EUAs are being prepared by a joint effort between the Department of Health and Human Services and the Department of Defense for current vaccine INDs. In all IND cases, without waiver or specific legal circumstance, individual notification and consent forms (informed consent) are required prior to administering the drugs under the supervision of a principle investigator (e.g., a command surgeon). All principle investigators should be trained in accordance with FDA approved good clinical practices and should be familiar with the expected drug side effects and clinical indications. Individual records and follow-up medical assessments are required after the administration of INDs. The Services and the combatant commands should prepare, coordinate, and plan for implementation to the tactical level.

g. Treatment. Local commanders should plan for and resource, within their capabilities, the ability to treat all personnel enumerated in reference (a). Operational level commanders should plan for and resource for the treatment of all personnel, based on the largest eligible population in their AOR. Resource and capability requirements should be based on the consequence management assessment discussed above. Additionally, commanders should review mutual support agreements with off-installation support activities and identify requirements in the event of a biological attack. Mutual support agreements should be exercised regularly.

h. Restriction of Movement (ROM) and Quarantine. Each installation and unit will plan for ROM and quarantine. This planning should include, but not be limited to, legal authority; personnel tracking and accountability; ensuring continuity of essential services; criteria to initiate and terminate ROM or quarantine; extent; enforcement of boundaries; interaction with local, state, and federal agencies and their HN equivalents; support of quarantined personnel; legal issues; mission impact. Operational and strategic level commanders should plan for mission accomplishment in ROM and quarantine situations and support quarantined units and facilities. Strategic level and operational level commanders should designate lower level commanders with authority to implement quarantine on military facilities and provide policy for quarantine implementation.

i. Liaison. Liaisons should serve as points of contact within organizations. More importantly, liaison and points of contact should be established, documented, and exercised with the appropriate local, state,

and federal officials who may assist in the detection of or response to a biological attack. OSD and the Joint Staff should establish and promulgate standard procedures for federal-level coordination with Service entities and other federal or non-US national, state, and local agencies. The Services and operational level commanders should implement these procedures.

j. Medical Surveillance and Medical Sampling:

(1) Some military installations do not have US medical treatment facilities on site or may use non-military assets. The Services, installation commanders, and operational level commanders that have forces and facilities not served by a medical treatment facility (MTF) should establish coordination and medical surveillance procedures that will specifically provide medical surveillance of the served military. Services and geographic combatant commands should establish procedures for the surveillance of Reserve and National Guard units based on their priority within mission-essential OPLAN execution.

(2) Given risk tolerance, the absence of technical detectors and the need to detect and identify an attack before an epidemiological detection, commanders may opt to institute medical sampling. That is, when directed by the commander, as specified by the surgeon, MTFs that do not have a detection capability on site should sample from a percentage of all persons exhibiting non-specific flu-like symptoms and analyze (or forward to the appropriate laboratory) the samples for the agents (diseases) on the JCS threat list.

k. Establish Laboratory Capability. The issue of transporting suspected or confirmed biological agent samples across international boundaries becomes more problematic every day. With the denials of landing and/or movement rights for vehicles (air, land, water), transporting samples could, at a minimum, delay definitive defensive actions or, at worst, render the samples useless. Initial sample analysis results, produced by a technology more sensitive and more specific than fielded DOD identification systems, must be available no later than 12 hours after collection of the sample. The combatant commands, using component service assets, should establish sufficient laboratory capability to meet the 12-hour criteria. Commanders should consider the use of shipboard laboratory capability as a possible solution to political and operational constraints.

l. Actions and Criteria for Actions. Each facility or organization will establish an action list or SOP for identification of a biological attack and the response to such an attack. This should be synchronized with the installation's anti-terrorism or force protection weapons of mass

destruction plan. Examples of material included in this SOP include biological detector employment procedures; medical surveillance procedures; point of contact information; prophylaxis and treatment regimes; assistance augmentation; notification and warning procedures; public relations guidance; physical security; initial ROM and quarantine preparation actions. An action list should be prepared for each specific agent on the JCS threat list and should be standardized across the AOR to the extent possible. All procedures, SOPs, etc., should be included in installation and unit operational or emergency operations centers.

m. Exercise and Training:

(1) Each installation and unit should plan and execute exercises for all aspects of biological defense at least once every 12 months; this includes all interactions with the local, state, and federal agencies. Operational level commanders should exercise all support plans and alternative mission accomplishment plans.

(2) Training requirements -- individual, group, and unit -- should be identified, resourced, and executed. The planning, training, and exercise for BW defense must be integrated into all aspects of operations. Response will vary in scale from procedures for handling suspicious packages, executing medical prophylaxis and IND protocol, to enforcing and supporting restriction of movement and quarantine for large units or groups of units, as well as civilian interface.

3. Daily Activities. (Action(s) that should occur daily. Each facility or unit should include BW defense and consequence management in daily operations, briefings, and staff meetings.)

a. Detector Duty Cycle. Detector duty cycle should be reviewed at least daily for those units and facilities with the capability; detector duty cycle and readiness states should be included in daily situational and staff briefings at all levels.

b. Medical Surveillance:

(1) Medical surveillance should be executed daily for those units and facilities with the capability. If necessary, facilities and units should maintain internal records of disease, syndromic surveillance data, and non-battle injury rates on a daily basis and institute a system to analyze the data daily. Additionally, facilities and units that have laboratory capability should ensure surveillance is inclusive of laboratory results such that single positive results are addressed immediately. Combatant commanders should establish criteria for action based on change in these rates.

(2) Many personnel refrain from attending sick call, acute minor illness clinics, etc., until they decide they really need medical advice. For biological defense, all personnel should be encouraged to seek medical assistance at the earliest opportunity. This greatly increases medical workload but may be the only way to increase the probability of early clinical detection and identification of a biological attack. Commands may wish to encourage an "if you feel sick, go to the clinic" approach to facilitate early medical screening.

c. Individual and Collective Protection Duty Cycle. Individual and collective protection duty cycle and status should be included in daily situational and staff briefings at all levels.

d. Operational and Physical Security Emphasis on Biological Warfare Defense. All normal operational security, conventional defensive actions, and physical security actions enhance BW defense. Commanders should ensure that physical security personnel are particularly knowledgeable on the possible indicators and/or means of covert BW dissemination. Operational and physical security should be executed daily and reviewed daily and as threat levels change.

e. Environmental Monitoring and Archiving. All environmental and meteorological data should be preserved, on a daily basis, for use in forensic and post exposure operational decision making. All environmental and meteorological data should also be preserved for comparison to aerosol background surveillance data. There should be standard data recording and preservation procedures throughout the AOR.

4. <u>During an Attack</u>. Actions taken during an attack are taken in response to a weapons trigger event or a detector alarm trigger event (i.e., they are limited to those cases where there is evidence of a probable attack). For example, if there is a weapons trigger event, such as a ballistic missile or aircraft attack warning, personnel should be masked or enter collective protection as a precaution against biological attack. In the absence of higher command guidance, local commanders should establish "all-clear" criteria based on cloud time of arrival assumptions derived from ATP-45B. Placing personnel in field-expedient collective or individual protection may be effective in reducing exposure. Such measures may be employed as required, but protection assumptions should not be included in consequence management requirements planning.

a. Alert and Warning to Others. All attacks by conventional delivery systems or conventional munitions are reported throughout the

chain of command, as well as laterally. Units and/or facilities should initiate BW defense actions based on possible BW inclusion in "conventional" attacks, e.g., activating the sampling team given the possibility of surface-to-surface missile system (SCUD) impacts. Commanders with biological detection assets should warn other units and/or organizations based on procedures outlined by the NBCWRS as well as civilian entities in the United States, if applicable, foreign civilian, and military authorities. Operational level commanders should publish guidance for issuing warning, both in CONUS and OCONUS.

b. Sample Collection, Transportation and Analysis. Within the Services, commanders at all levels should establish, resource, train, and exercise for the collection of possible BW samples, including samples from food and water. SOPs for existing military detectors and detection kits should be formalized by operational commanders and coordinated across AORs. Procedures also should be established to sample during any event that could cause the dissemination of a biological agent. These include, but are not limited to, bomb, missile impact, high explosive covert detonations, unusual spray devices, etc. Across the AOR, laboratory support should be in place and managed to serve units as they deploy or maneuver. Transportation of samples across international boundaries or in some instances between states and/or local jurisdictions may be politically sensitive.

5. <u>After an Attack</u>. The list below enumerates actions taken after an attack. These actions have been discussed previously. This list is provided as the basis of a checklist for unit or facility specific development and use.

a. Attack determination source

(1) Detectors

(2) Medical surveillance disease or symptoms

(3) Other warning, explosion SCUD, etc.

b. Identify the biological agent and/or disease

(1) Detectors

(2) Clinically

(3) Sampling

c. Warn as appropriate

d. Initiate medical prophylaxis as appropriate

e. Initiate medical treatment as appropriate

f. Coordinate and communicate; up chain of command; outward liaison local, etc.

g. Implement public relations, internal and external

h. Ensure operational infrastructure

i. Initiate mission triage or reassignment

j. Obtain augmentation

k. Contagion control

l. Control access

m. Enforce hygiene and safety awareness

n. Establish and enforce ROM and quarantine

o. Conduct decontamination

p. Conduct mortuary operations

q. Conduct medical evacuation

r. Initiate plan branches or sequels

ENCLOSURE C

RESPONSIBILITIES

1. High-Level and Cross-Cutting Actions Required to Implement a DOD-Wide Strategy for Biological Defense

a. Traditionally, integrating concepts, doctrine, and TTP have been a Service responsibility. As warfare became global and military technology became more complex and capable (ballistic missiles, nuclear weapons, stealth, biological weapons, etc.), more and greater multi-Service and joint doctrine has evolved. Biological defense particularly calls for broad, all-encompassing doctrine. However, to effectively derive and implement such a doctrine and then implement it at the TTP level, many issues should be addressed at the senior policy and joint operational level.

b. This enclosure lists issues that must be addressed from the top down and standardized across the DOD for operational warfare, homeland security, and force protection. The crosscutting actions required for DOD-wide implementation of the strategy are listed in order of the operational elements of Sense, Shape, Shield, and Sustain and their included attributes.

2. Sense. The Services, combatant commands, Joint Staff, and OSD should establish appropriate BW surveillance assets (personnel, units, and systems) and processes.

a. Aerosol Background Surveillance. The combatant commands and the Joint Staff should implement a system to characterize the worldwide environmental background and surveillance of potential biological agent background as it pertains to biological defense and detection, with initial priority based on current threat information and OPLANs.

b. Meteorological Surveillance

c. Medical Surveillance

(1) The Services, combatant commands, and the Joint Staff should define the joint operational requirements for medical surveillance.

(2) The Services, combatant commands, Joint Staff, and OSD should implement a single, comprehensive worldwide medical surveillance system that can capture and analyze syndromic data and that also provides reporting capabilities to achieve real-time surveillance.

d. Epidemiological Analysis and Detection

(1) The Joint Staff and OSD should provide the Services and combatant commands standardized decision aids to assist in epidemiological detection.

(2) The Services, combatant commands, and the Joint Staff should establish criteria for action, based on epidemiological detection.

e. Intelligence, Reconnaissance and Surveillance

f. Biological Agent Detection Operations

(1) The Services and combatant commands should plan for the deployment and support of biological detection systems. Additionally, specific common biological detection doctrine and decision aids relating risk, technical capability, cost, and operational effectiveness, etc., should be developed and coordinated by the Joint Staff and OSD and provided to the Services and the combatant commands.

(2) The Services, the combatant commands, and the Joint Staff should establish common criteria for action based on the output of technical biological detection devices.

(3) Medical lab and sampling capability must be developed that adequately supports biological sampling operations and successfully augments biological detection and sampling operations. This capability must be robust enough to ensure sampling timelines are met and necessary medical specimens, animal specimens, and environmental samples can be adequately collected and analyzed in a timely fashion.

g. Sampling and Handling Procedures. The Joint Staff and OSD should establish and implement standard procedures for sample collection, handling, transportation, and processing of biological warfare agents. The Services and combatant commands should implement the sampling procedures as established by the Joint Staff and OSD.

h. Identification of Biological Warfare Agents. The Joint Staff and OSD should establish a set of standard definitions and performance descriptors for identification. The Services and combatant commands should establish common criteria for action based on identification. The geographic combatant commands should have the capability to conduct sample collection and transportation and to perform laboratory level

identification 12 hours after sample collection, regardless of collection location.

3. Shape

a. The Joint Staff and OSD should develop an exercise program to serve as a review and validation of this strategy.

b. The Joint Staff and OSD should establish a cross-functional, joint central point of expertise for biological defense operations and leadership at the national military level.

c. The Joint Staff and OSD should assign an office of primary responsibility for each issue in this appendix.

d. The Joint Requirements Office for CBRN defense should implement and oversee an action plan to accomplish the required actions identified in this appendix.

e. The Joint Staff should establish a set of unique and standard definitions for BW defense terms, a lexicon, and update Joint Publication 1-02, "Department of Defense Dictionary of Military and Associated Terms," accordingly. OSD should obtain the required Service end strength increases to support implementation of this strategy.

f. Intelligence Preparation of the Battlespace (Strategic and Operational Biological Warfare Vulnerability Analysis):

(1) The Joint Staff and OSD should establish a BW red team capability to identify national military vulnerabilities to BW attacks.

(2) The Services, combatant commands, Joint Staff, and OSD should conduct strategic and operational level vulnerability analyses, identifying those assets that must be protected against BW effects.

g. Commander's Guidance. The combatant commands should establish common criteria for action, based on indications and warning.

h. Planning

(1) The Services, combatant commands, Joint Staff, and OSD need to understand, assess, and plan for the implications of BW attacks on agriculture or other economic targets such as fuel, DOD specialty manufacturing facilities, etc.

(2) The Services, combatant commands, Joint Staff, and OSD should develop, adopt, and support standard planning and analytical tools for BW defense.

i. Alternative Courses of Action for Mission Accomplishment. The combatant commands in coordination with the Services, Joint Staff, and OSD should develop and resource alternative operational plans to achieve mission accomplishment within a BW environment.

j. Readiness. The Services, combatant commands, Joint Staff, and OSD should coordinate for measuring and reporting biological defense readiness.

k. Information Operations. The Joint Staff and OSD should prepare the overall information plan for BW defense and coordinate with the Services and combatant commands for implementation.

l. Public Relations, Media Relations, and Information Management

m. Education, Training, and Exercise

(1) The Services, Joint Staff, and OSD should establish and resource the appropriate professional education and provide the Services, combatant commands, Joint Staff, and OSD qualified BW defense experts.

(2) The Services, combatant commands, Joint Staff, and OSD should ensure adequate and realistic BW defense exercises are conducted and BW defense is properly integrated into other exercises.

n. Warning and Reporting

(1) The Joint Staff and OSD should establish and maintain worldwide joint military BW warning and reporting system above and beyond that specified in CJCSM 3150-.03B and in the US-approved version of the ATP-45B as implemented in the NBCWRS.

(2) The Services and the combatant commands should determine warning and reporting criteria in addition to those outlined in CJCSM 3150.03B and the NBCWRS based on current capabilities and mission risk tolerance.

o. Liaison and Communication

p. Decision-Making Criteria. The Services, combatant commands, Joint Staff, and OSD should establish BW defense criteria for force protection condition determination.

q. Non-Proliferation and Counterproliferation

r. Special USTRANSCOM Considerations. The Joint Staff and OSD in coordination with the Services, combatant commands, and concerned federal agencies should establish standards for operational BW safety, risk guidance, guidance for the transportation of personnel, casualties, human remains, and materiel from an active BW theater.

4. Shield

a. The Services, combatant commands, Joint Staff, and OSD should establish protection standards and implementation guidance for these standards for all personnel addressed in this strategy.

b. The Services and combatant commands should develop physical protection criteria based on mission accomplishment and risk.

c. The Services, combatant commands, Joint Staff, and OSD should track personnel movements (units, groups, or individuals) in sufficient time and detail to implement medical countermeasures.

d. Physical Protection

e. Individual Protection

(1) The Services and the combatant commands should establish criteria for masking and unmasking against biological agents.

(2) The Services, Joint Staff, and OSD should test and exercise operational employment of COTS equipment, publish a list of approved COTS equipment, and develop supporting doctrine and TTPs for use as well as conduct legal review for implications of use by family members, contractors, other civilians, etc.

f. Collective Protection

(1) The Services and the combatant commands should establish standard criteria for initiating and ceasing collective protection.

(2) The Services and the combatant commands should publish priorities for collective protection installation.

g. Medical Protection

(1) The Joint Staff and OSD in coordination with the Services and combatant commands should determine the requirements for prophylaxes, resource the capabilities to provide prophylaxis to personnel, and establish criteria for administration.

(2) The Services, combatant commands, Joint Staff, and OSD should derive standard planning guidance to estimate the effectiveness of prophylaxis.

(3) The Joint Staff and OSD should develop and provide the Services and the combatant commands with a list of approved and investigational new drugs for prophylactic use as well as standard guidance for such issues as informed consent.

5. Sustain

a. Medical Treatment

(1) The Services and the combatant commands should establish their requirements for and their capabilities to treat personnel at the various standards of care.

(2) The Services, combatant commands, Joint Staff, and OSD should plan for and resource the medical treatment of mass biological casualties.

(3) The Services and the combatant commands should assess operational implications of a mass casualty attack.

b. Restriction f Movement (ROM) and Quarantine

(1) The Joint Staff should provide implementing operational guidance for DODD 6200.3.

(2) The Services, combatant commands, and Joint Staff should assess operational implications of quarantine.

c. Individual Replacement and Unit Replacement. The combatant commands, Joint Staff, and OSD should assess the requirement for replacements, individual, and unit, in coordination with the Services. This action should be linked to the strategic vulnerability analysis, resources, and mission accomplishment.

d. Decontamination. The Joint Staff and OSD in coordination with the Services, combatant commands, and concerned federal agencies should establish standards for BW agent decontamination.

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ENCLOSURE D

BIOLOGICAL AGENT EFFECT AND PROPHYLAXIS TIMELINES

1. This enclosure presents an illustration of the time interaction for biological defense, i.e., time to onset of effect, time to detect by technical or medical means, and time duration and effectiveness of the post-exposure prophylactic window. The relative times of occurrence pictured in the accompanying graph are not precise. For example, in a best-case scenario, technical detectors provide information at 1 hour and 24 hours, as shown. Realistically, there is some unknown probability that the devices will detect the agent release. Similarly, the time range for onset and outcome of the disease are approximate and shown in the absence of treatment. Data on the effects of these agents on humans from a biological agent rather than the naturally induced form of the disease are sparse [references (e) and (f)]. Secondary infections from contagious agents are not shown.

a. Note the time ranges for medical detection. These time ranges include detection based on surveillance of disease incidence, clinical diagnosis, and clinical laboratory identification. The actions of medical personnel and their ability to commit resources can move the “detection” along this continuum.

b. The significance of post-exposure prophylaxis is indicated by the timeframe during which it is effective (see figures below). The earlier prophylaxis is implemented, the more successful it will be at preventing disease, as shown by the slope of the line.

c. The information presented is for that portion of the exposed population that is infected or intoxicated by an attack, i.e., those personnel who eventually will become casualties or fatalities. The actual number of personnel affected by any attack will vary greatly. In the figures below, the green portion of the bar represents those who are not sick but will become ill; the yellow represents those who are ill; the red represents those who become fatalities. Note that in several cases, a second green portion on the right side of the bar shows recovery. Technical detection times are indicated on the horizontal time axis and a black line above each agent bar represents medical detection times. The “prophylaxis window” is shown in purple. For agents such as anthrax and plague, when prophylaxis becomes less effective with the passage of time, the bar is shown diminishing at an angle. Where prophylaxis may be administered effectively any time within a window, as shown for small pox and Q fever, the bar is as a rectangle. Where there is no bar, the administration of post-exposure prophylaxis is ineffective.

c. The rule of thumb for biological defense is to take action as early as possible, whether it is protection, prophylaxis, or implementing alternative courses of action for mission accomplishment.

2. Time Courses of Disease: Indicating Detection and Prophylaxis Window

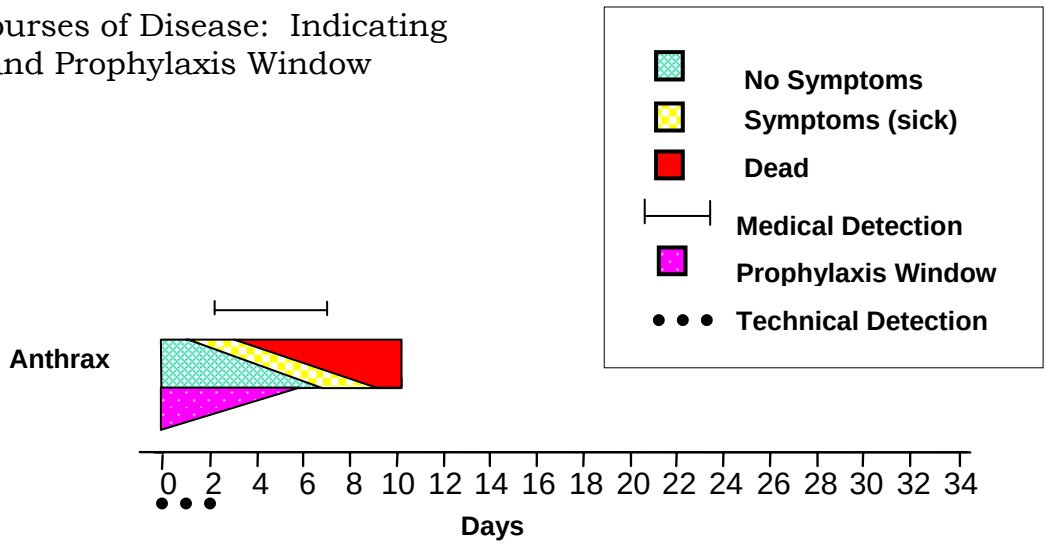

Figure D-1. Anthrax Time Course

a. Anthrax: Anthrax has a high fatality rate; once symptoms begin, most patients cannot recover. Thus, it is of utmost importance that prophylaxis is available as soon after exposure as possible.

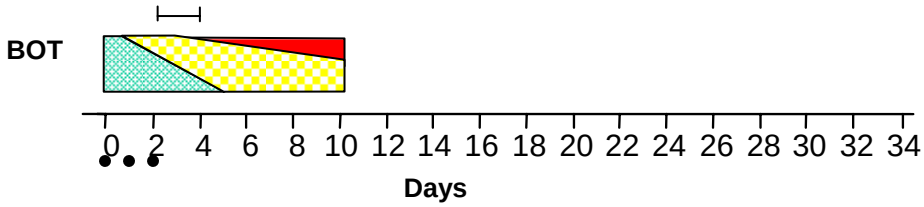

Figure D-2. Botulinum Toxin Time Course

b. Botulinum Toxin: In high doses, effects may present in less than a day. Death usually results from respiratory failure caused by paralysis of the respiratory muscles; care includes ventilatory assistance. Personnel surviving a botulinum toxin attack require considerable, intense long-term medical care.

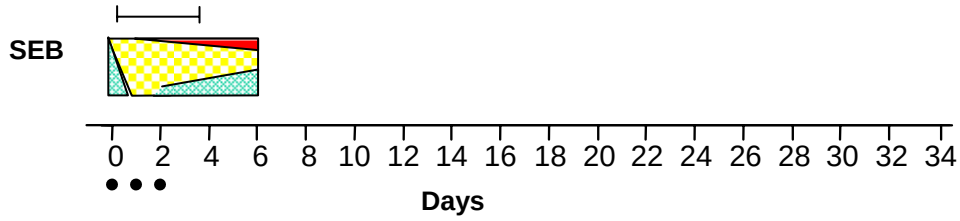

Figure D-3. Staphylococcal Enterotoxin B Time Course

c. SEB: The degree of incapacitation and the number of fatalities will depend on the dose individuals receive. The disease comes on rapidly, in a few hours for high doses. Fever lasts for only a few days, but feelings of malaise and cough may keep the Soldier off the battlefield for 2 to 4weeks.

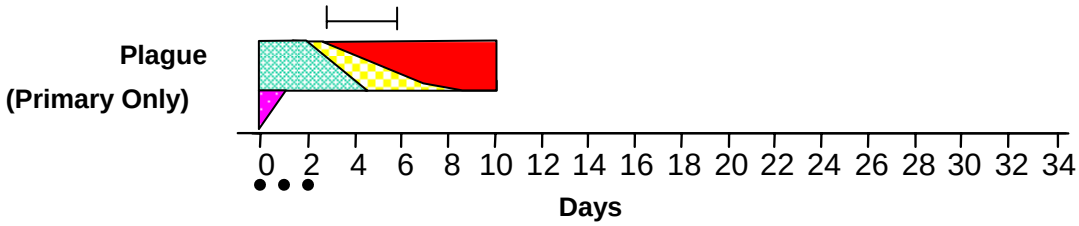

Figure D-4. Plague Time Course

d. Plague: This timeline only indicates primary infections. Pneumonic plague is a contagious disease that can spread rapidly. Plague progresses rapidly and is highly lethal. As with anthrax, prophylaxis must be given quickly after exposure.

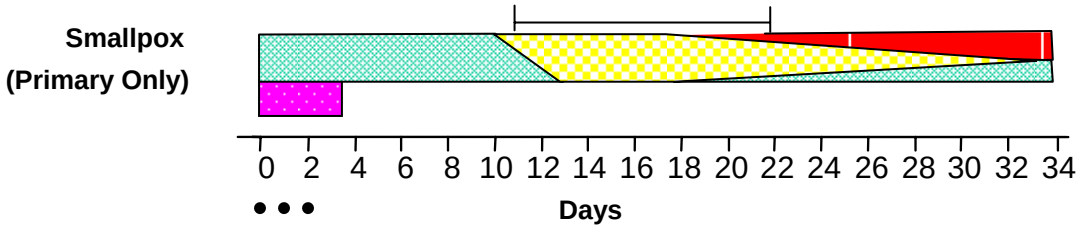

Figure D-5. Small Pox Time Course

e. Small pox: As with plague, this timeline only indicates primary infections. Effectiveness of post-exposure prophylaxis is restricted to a few days after exposure.

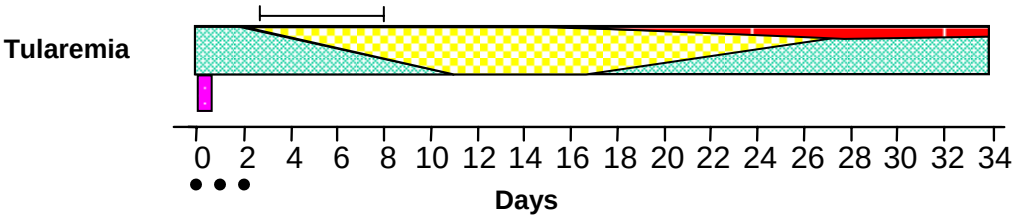

Figure D-6. Tularemia Time Course

f. Tularemia: Post-prophylaxis may be effective if the 2-week course is started within 24 hours of being exposed.

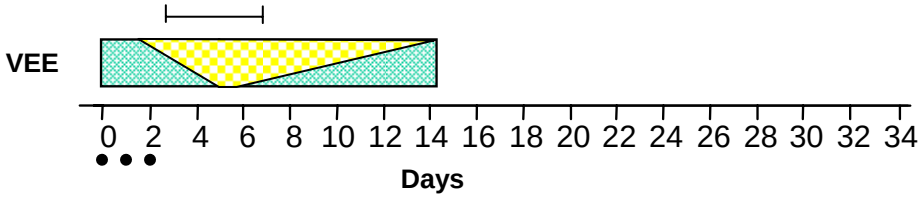

Figure D-7. Venezuelan Equine Encephalitis Time Course

g. Venezuelan equine encephalitis (VEE): VEE is a mild disease and, after it has run its course, most will recover. During that time personnel will be incapacitated to varying degrees.

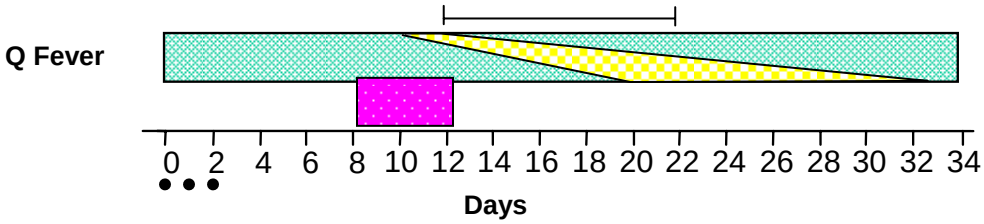

Figure D-8. Q Fever Time Course

i. Q Fever: Note the prophylaxis window for Q fever; to adequately prevent the disease, prophylaxis must be started 8 to 12 days after exposure and continue for 5 days. If given too early, though it will delay onset, it will not prevent the onset of symptoms.

ENCLOSURE E

TECHNICAL DESCRIPTION OF BIOLOGICAL AGENTS

Note: This enclosure is extracted from "Force Protection and Operations in a BW Environment, Commanders' Guidelines," dated 18 June 2002, pages 5 through 15 and has been modified for presentation. It is used by permission of the Policy Division, Directorate of Nuclear and Counter proliferation, Deputy Chief of Staff, Air and Space Operations, HQ USAF.

1. Understanding the Characteristics of the Biological Threat. Because BW events and agents vary so dramatically, a "one size fits all" response to a BW event will not work. The commander must be conversant with the basic technical parameters associated with BW in order to think through and to shape an effective response.

a. To aid in developing this understanding, the following is covered: 1) basic information on biological agents, including the types of agents, their characteristics, and how agents incapacitate or kill; 2) likely delivery systems; 3) operational impacts, including conditions that affect the potential intensity and duration of an event, and the number of personnel likely to be affected; 4) trigger events indicating that a BW event has likely occurred; and 5) mitigation strategies and their limitations.

b. Agent Characteristics. Biological agents are organisms or chemicals produced by organisms that affect humans in different ways. Some kill while others incapacitate; some act quickly while others incubate for several weeks; and some are contagious while others are not. Vaccinations, prophylaxis (medicines given before sickness), and treatments (after sickness) exist for some, but not for others. Before assessing impacts of biological weapons, one must first understand the nature of likely biological agents and how they work.

2. Types of Agents. Biological agents are either pathogens or toxins. Pathogens are microorganisms that directly attack human tissue and biological processes and include three categories: bacteria, viruses, and rickettsia.

a. Pathogens vary in their characteristics and in their treatments.

b. Bacteria (e.g., anthrax, tularemia, plague) are living single cell organisms, which can grow and reproduce in the environment, in plants, animals, or humans. Bacteria are susceptible to antibiotics but can develop resistance to antibiotics as strains evolve in nature, or as the result of the intentional genetic manipulation of strains. Vaccines exist for some bacteria as well.

c. Viruses (e.g., VEE, small pox) are smaller than bacteria, do not grow, and require a living host cell to make new copies of themselves. Antibiotics have no effect on viruses, but anti-viral agents such as vaccines can limit some viral illnesses.

d. Rickettsia (e.g., Q-fever, Rocky Mountain Spotted Fever) are intermediate in size, contain nearly everything necessary to make new copies of themselves, but rely on infected cells to make new copies. Antibiotics are effective against rickettsia.

e. Toxins are poisonous substances naturally produced by bacteria, plants, fungi, snakes, insects, and other living organisms. Common toxins include botulinum toxin (produced by bacteria); SEB (produced by bacteria); and ricin (produced by a plant). Toxins act to destroy organisms by overwhelming the organism's ability to rid itself of the poison it produces (intoxication). Bacteria can destroy organisms via both infection and intoxication. Plants, fungi, snakes, insects, and other living organisms intoxicate their victims via more direct means (injection, contact, ingestion), while viruses have no ability to intoxicate whatsoever.

3. Agent Effects

a. How devastating a BW agent will be on the human body depends on a number of variables. Minor changes in any one variable can result in a significant difference in the effectiveness of the attack, as well as in the effectiveness of the appropriate response.

b. Key variables include:

(1) Exposure levels. Since many medical countermeasures are time sensitive, how much of a particular pathogen or toxin an individual is exposed to affects both the lethality and the timing of the onset of symptoms.

(2) How the biological agent enters the body. The point of entry of the pathogen or the toxin often determines the lethality of the disease or poison. For example, anthrax has three possible points of entry: openings in the skin (cutaneous anthrax), ingestion (gastrointestinal anthrax), or inhalation (inhalational or pulmonary anthrax). The three forms of anthrax differ in number of organisms necessary to cause infection, fatality rate, and responsiveness to antibiotic therapy after onset of symptoms.

(3) Time to onset of symptoms and incubation periods. Some agents work within hours while others have incubation periods as

long as several weeks. This matters because it complicates the determination of when an attack occurred, how widespread the effects, and the available treatment strategies.

(4) Extent of communicability. Certain diseases, such as small pox and hemorrhagic fever, which are contagious, pose a greater challenge. These challenges include the risk to those in close contact -- including medical caregivers and the problems of separating the ill from those susceptible to becoming ill if exposed.

(5) Incapacitation v. lethality. Some agents kill while others only incapacitate their victims. Again, treatment and operational strategies are influenced by these factors. Where fatalities occur, there are varying periods of incapacitation prior to death.

4. Weaponization and Dissemination. Knowing how an agent can be disseminated is critical to shaping an effective response because the size, shape, intensity, and overall effectiveness of the agent deposition pattern are influenced by the delivery method. The attacker is likely to consider a number of issues when choosing a means of delivery, including ease of accessing and cost of weapons systems, size of targeted area, likelihood of successful delivery (i.e., penetration of defenses, susceptibility to meteorological uncertainties), covertness, and safety to the delivery team.

5. Weaponized BW Delivery

a. Theater ballistic missiles (TBMs) are a viable delivery means for many agents. With bulk warheads, release can be explosive or line release.

b. Submunitions. The size of the submunition pattern allows area targets to be more effectively contaminated. Coordinated salvos of TBMs, which would likely ensure at least one missile penetrating active defenses, pose even a greater challenge. Intercepted bulk-filled missiles do not affect the targeted airbase. However, in many designs, the submunitions may be released above the intercept altitude -- or only a small number of the submunitions becomes damaged by current active defense systems.

c. Ground sprayers can also be used to deliver agent. Because ground sprayer attacks will be initiated relatively close to the target, precise, real-time wind data can be used to select a place and time of release to optimize accuracy. Ground sprayers can be stationary or vehicle-mounted. If released from a moving vehicle, the resulting line source can cover a very large area and the attackers risk being detected.

d. Aircraft sprayers, as an airborne line source, can yield dosage patterns that cover very large areas. Since these patterns can be several

hundred kilometers long, agents can be released far upwind of the intended target area. Remote releases may allow attackers to avoid having to penetrate air defenses. Warning and alert of attacks of this type depend on the ability to closely monitor enemy air traffic patterns and identify suspicious flight profiles.

e. Mortar, artillery, and multiple rocket launchers (MRLs) are well suited to deliver biological agents. Artillery attacks can deliver an extremely large amount of agent very accurately. Shells filled with biological agents can be used in a combined attack with chemical and conventional explosive shells making it difficult to recognize the event as a BW attack.

Covert Attack of BW

Small amounts of BW agent can be very effective. Thus, they can be easily concealed, transported, and released by adversaries. The delayed effects of BW mean:

- Attackers can escape undetected, allowing plausible deniability.
- Infected individuals with contagious agents might unwittingly disperse during the incubation time, making it difficult to investigate and counter the attack

Because of these factors, biological weapons are particularly suited for covert attacks.

6. Other Means of Biological Agent Delivery. In addition to weapons-associated delivery of biological agent, biological agent can be disseminated through other means.

a. Vector-mediated delivery occurs when insects or other animals are utilized to disseminate BW agents. Vector-mediated delivery allows for clandestine release that is hard to identify or to attribute to a specific adversary. The Japanese used plague-infected fleas with devastating effect against the Chinese. As recently as 2000, there was concern that West Nile encephalitis was a deliberate biological event until it was proven to be an endemic event.

b. Fomite spread. Using inanimate objects (fomites) to spread agents is another potential way to disseminate biological agents, such as small pox. Evidence suggests that while the primary means of transmission of small pox is person-to-person contact, small pox virions can also be spread via human contact with contaminated surfaces or by aerosolization, increasing the hazard of the spread of contagion. The recent case of anthrax-mixed powders shows the efficacy of fomite spread.

c. Food or consumer product contamination. Food or other products for human consumption are also a group vulnerable to biological agent contamination. Many can be laced with pathogens, such as the salad bar in The Dalles, Oregon, contaminated with salmonella by the Rajneeshee cult to keep voters away from the polls in 1984. Another

example would be the inadvertent contamination in a meat processing plant utilized by a food chain for their hamburger supply that resulted in E. coli illnesses. Other products can be spiked with poisons, as was the case with the Chilean grapes injected with cyanide in March 1989 or the Tylenol product tampering cases in the 1980s.

d. Water contamination. Water supplies are a potential means for biological attack since some pathogens can grow in water, survive for considerable lengths of time, or survive normal chlorination and filtration treatments in municipal water supply systems. Similarly, toxins, which are generally unresponsive to normal water treatment, can be transported via water supplies. However, the amount of agent required having an operational impact makes this a less likely means of delivery. On the other hand, attacking a specific building by creating a high-pressure "tap" of the water supply is technically straightforward and requires fewer agents.

7. Operational and Force Protection Impacts. It is critical to note that biological weapons differ from chemical weapons in operationally significant ways that dictate different responses and risk trade-offs. A few key differences are illustrated in Figure E-1. A biological attack is a very complex process that depends on several technical factors, all of which determine its operational impact. These factors fall into three categories: lethality factors, environmental factors, and source factors.

	CHEMICAL	BIOLOGICAL
Release Site of Weapon	Quickly discovered, possible to cordon off contaminated/ attack areas	Difficult to identify, probably not possible or useful to cordon off area of attack
Manifestation of Symptoms	Rapid, usually minutes to hours after an attack	Delayed, usually days to weeks after an attack (except toxins)
Distribution of Affected Patients	Downwind area near point of release	Widely and rapidly spread, difficult to track or predict
Signatures	Easily observed (colored residue, dead foliage, pungent odor, dead insect and animal life)	Typically no characteristic signatures immediately after attack
Medical Counter-measures	Chemical antidotes	Limited vaccines, antibodies, and/or antitoxins and antivirals for some agents
Casualty Management and Contamination	After decontamination and/or weathering, no further need for protective measures or risk of further contamination	Patient isolation and/or quarantine crucial if communicable disease is involved

Figure E-1. Release Site of Weapon

A biological attack is a very complex process that depends on several technical factors, all of which determine its operational impact. These

factors fall into three categories: lethality factors, environmental factors, and source factors.

8. Lethality. The lethality of an agent, or the rate at which it kills its victims, has an obvious impact on force protection and operations. Many factors contribute to the lethality of event, including agent effects. Of additional note:

a. Potency. The potency of the agent will partially dictate the number of casualties relative to the agent delivered. Highly infective agents are more lethal because less mass is required.

b. Particle Size. Only small particles (1-10 microns) will reach the lower lungs, where they can cause harm. Size is a function of how the agent is manufactured and processed for weaponization.

c. Means of entering the body. Almost all BW agents are more effective if inhaled. For physical reasons, different-sized particles will become embedded in different parts of the respiratory system. Therefore, for any batch of agent, the distribution of particle size is a key lethality factor. Anthrax is a good example. The lower respiratory system provides the conditions for anthrax to survive, grow, and multiply. Anthrax spores must reach this area to cause inhalational anthrax, and only particles from 1-5 microns will reach these areas with high efficiency. Therefore, lethal dose is dependent on particle size distribution. Other agents infect different sections of the respiratory system and must be released in appropriate particle sizes to be effective.

9. Source Factors. Source factors expand the number of possible scenarios that must be considered before a response is structured. More specifically, source factors include fill type (or how the agent is manufactured) and release mechanism.

a. Fill type. Agents can be produced in a variety of forms depending on the manufacturing process. For example, anthrax can be manufactured as a wet slurry or as a dry powder. Anthrax transport and diffusion is much more efficient as a dry powder than as a wet slurry, but it is more difficult to weaponize and to handle. Thus, how it is manufactured depends on the expertise of the attacker and the equipment and/or infrastructure.

b. Release mechanism. The mechanism for release has a significant impact on how much of the agent survive the release event and the size, shape, and concentration of the pattern of dispersion.

10. Environmental Factors. Environmental factors encompass agent interaction with the ambient environment, from the point of release until inhaled by a human. Environmental factors will dictate the size, shape, dosage at inhalation, height of agent deposition, and concentration of agent deposition patterns on the ground. Thus, environmental and weather conditions can be extremely critical in determining how effective the attack will be, particularly with certain delivery systems. This factor is so critical that weather and time of day can provide a guide to protection options in a high threat situation. More specifically:

Environmental and weather conditions can be extremely critical to determining how effective the attack will be, particularly with certain delivery systems. This factor is so critical that weather and time of day can provide a guide to protection options in a high threat situation.

a. Wind speed and direction. Since biological agents are released as small particles and aerosols, they tend to move with the winds. Stronger winds move the clouds faster, resulting in lower exposure. In calm conditions, the agent cloud stays close to the release site. This results in a significantly higher risk of exposure, which lasts until the wind speed increases enough to move the agent-containing air package downwind. However, these wind conditions can actually lead to larger casualties depending on the position of personnel and the type agent. A very infectious agent moving rapidly over terrain will expose more people but at an effective level to cause casualties. The same release, lingering in a smaller area will effect less personnel overall. All interactions for BW are agent specific.

b. Atmospheric stability, layering, and mixing. A successful attack requires the agent mixing with air. This is caused by turbulence in the atmosphere. Stable layers restrict vertical movement of agent particles, so agent released below an inversion remains available for inhalation and causes a higher likelihood of exposure. Agent released above an inversion may not be able to penetrate the inversion layer, so mixing down to the ground would occur only when the inversion layer is broken -- perhaps at dawn -- well downwind from the release point.

c. Terrain. Landforms, buildings, and surface coverings (trees, brush, sand, asphalt) influence the channeling of local wind, and affect spatial agent distribution.

d. Rates of biological decay or inactivation in the atmosphere. Biological agents decay in the atmosphere at different rates based on heat, humidity, and exposure to ultraviolet (UV) light, but most will survive for relatively short periods (minutes to hours) in the open

atmosphere. The relatively low rate of biological decay of anthrax spores makes anthrax an attractive biological agent. Anthrax can survive between 1 and 2 days in the air. Since UV light is the primary cause of anthrax spore decay, night attacks would likely be most effective, but daytime attacks can still be effective on a fixed site target. SEB and ricin decay very little. Ricin is not very toxic, so this benefit is offset.

e. Rates of decay in soil, water, and on surfaces. In a weaponized release, the level of deposition onto ground surfaces is very low. Agent survival on surfaces is an important characteristic for considering the risk from re-aerosolization and the need for decontamination. Anthrax spores and small pox virions have been found to be quite stable in soil (many years).

f. Time of day. Because each agent biologically decays at a different rate depending on temperature, humidity, and UV light intensity, the time of day affects the operational impacts of an attack. In general, nighttime or early morning, with its lower temperatures and UV light, provides the best conditions for successful BW attacks because of lower biological decay and because neutral and inversion conditions – especially with low wind speeds -- result in agent clouds, which maintain lower physical decay (i.e., spreading of the biological agent over time.).

g. Potential for re-aerosolization. Most biological agents are not persistent and will decay within hours or days under exposure to the environment. However, anthrax spores can survive in a non-vegetative state for years if embedded just beneath the surface where they would be shielded from UV radiation, temperature, and humidity effects. Some evidence, including the recent experience with anthrax, suggests that, if disturbed, anthrax can re-aerosolize, possibly generating a local dosage hazard.

ENCLOSURE F

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GLOSSARY

ABBREVIATIONS AND ACRONYMS

AOR	area of responsibility
ATP-45B	Allied Tactical Publication 45-B
BIDS	Biological Detection System
BIDS P3I	Biological Detection System Preplanned Product Improvement
BW	biological warfare
C4	command, control, communications, and computers
C4ISR	command, control, communications, computers, intelligence surveillance, and reconnaissance
CBR	chemical, biological, radiological
CBRN	chemical, biological, radiological, and nuclear
CBRNE	chemical, biological, radiological, nuclear, and high yield explosives
CDC	Centers for Disease Control and Prevention
CONUS	continental United States
COTS	commercial off-the-shelf
DFU	dry filter unit
DOD	Department of Defense
DOTMLPF	doctrine, organization, training, materiel, leadership and education, personnel, and facilities
EHS	environmental health and safety
EUA	emergency use authorization
FDA	Food and Drug Administration
HEPA	high efficiency particulate air filter
HN	host nation
HQ	headquarters
IBADS	Interim Biological Agent Detection System
IDA	Institute for Defense Analyses
IND	investigational new drugs
IO	information operations
IPB	intelligence preparation of the battlespace
JBPDS	Joint Biological Point Detection System

JCS	Joint Chiefs of Staff
LRBSDS	Long-Range Biological Stand-Off Detection System
MOPP	mission-oriented protective posture
MRL	multiple rocket launchers
MTF	medical treatment facility
NBC	nuclear, biological, and chemical
NBCCC	Nuclear, Biological, and Chemical Collection Center
NBCWRS	Nuclear, Biological, and Chemical Warning and Reporting System
NIOSH	National Institute for Occupational Safety and Health
OCONUS	outside the continental United States
OPLAN	operation plan
OSD	Office of the Secretary of Defense
RAPID	ruggedized advanced pathogen identification device
ROM	restriction of movement
SCUD	surface-to-surface missile system
SEB	staphylococcal enterotoxin B
SOP	standard operating procedure
STANAG	standardization agreement (NATO)
TBM	theater ballistic missiles
TTP	tactics, techniques, and procedures
USAMRIID	US Army Medical Research Institute of Infectious Diseases
USTRANSCOM	United States Transportation Command
UV	ultraviolet
VEE	Venezuelan equine encephalitis

PART II--Terms and Definitions

advanced concept technology demonstration (ACTD). An ACTD is a method of acquiring, adapting, and evaluating commercial/government-off-the-shelf (COTS/GOTS) technology to determine its applicability to military use. The method is intended to leverage COTS/GOTS technology, adapt and evaluate its application for military use, and to expedite fielding and economize acquisition resources.

collection. Collection is a function within a biological warfare (BW) detector that collects and concentrates the airborne sample for further analysis. International Task Force-23 does not define collection as a separate function, but it does state that one of the roles of a BW detector is "to collect and identify high quality samples to meet both the military and political verification requirement and to notify national authorities of BW agent offensive use."

confirmatory identification. See "identification, confirmatory."

detection. A generic detection component that analyzes aerosol particle contents to determine if they are biological in origin, indicating a higher probability of introduction of BW aerosol. This function may also classify the suspect aerosol by broad category (e.g., spore, bacterium, toxin and/or macromolecule, virus), or by presence of generic markers. International Task Force 23 and North Atlantic Treaty Organization Land Group Number 7 call this function "generic detection/identification, and states that this function: "… involves the analysis of aerosol particle contents to determine if they are biological in origin (versus other particulate matter)."

detection, epidemiological. The detection of a pattern of disease within a population that may indicate a biological attack. For the near future, epidemiological detection will be the most likely source of information on forces exposed to biological agents.

detection, point. Point detectors are those sensors that must be in the aerosol plume or have the suspect biological warfare agent introduced into/onto them for sensing. Point detection systems have traditionally encompassed all four of the above functionalities: trigger/cue, detect, collect, and presumptively identify. The Joint Program Office for Biological Defense envisions two roles that point may fulfill, and those roles will drive the sensor and system designs.

detection, standoff. Detection at a distance away from the aerosol and/or plume or the detector system. The standoff detector is located in

a “clean” area and attempts to detect possible contaminated areas from a distance from the detector.

environmental health surveillance. See “surveillance, environmental health.”

epidemiological analysis and detection. The study and processing of data and/or indications provided by medical surveillance. This analysis processes medical surveillance data and determines when there are anomalies in the expected incidence of disease.

epidemiological detection. See “detection, epidemiological.”

identification. Identification is the specific identification biological warfare organism as to genus and species, and specific toxin. Identification allows medical decision makers to refine post-attack treatment protocols, adds confidence to detection alarms and downwind hazard predictions previously made on the sensor data, and provides more input to command decision makers.

identification, confirmatory. Confirmatory identification is the backup identification biological warfare (BW) agents that have been presumptively identified by BW sensors. This activity requires more sensitive, laboratory-style analysis techniques. International Task Force-23 states that “Confirmatory test are required to verify the initial diagnoses, confirm the detection system results and to augment the evaluation of the threat agent.” This level of identification will help the medical decision makers refine post-attack treatment protocols, add confidence to detection alarms and downwind hazard predictions previously made on the sensor data, and provide more input to command decision makers who must decide the course of action to take in light of an illegal act of war.

individual protection. Must provide the joint force improved individual protection, allowing it to operate long-term, safely, and at near-normal levels of effectiveness while under CBRN threat, toxic industrial material, or other environmental hazard areas.

isolation. The separation of infected individuals from those uninfected for the period of communicability of a particular disease.

Joint Biological Agent Identification and Diagnostic System (JBAID). The JBAID is a robust, reusable, portable, modifiable biological agent identification and diagnostic device capable of simultaneous reliable identification of multiple biological agents of operational concern and other pathogens of clinical significance. JBAID will enhance force

protection by providing commanders and medical personnel the capability to determine effective preventive measures, prophylaxis, and appropriate treatment in response to the presence of biological agents.

Joint Biological Point Detection System (JBPDS). The JBPDS provides commanders with a capability to sample, detect, and identify all classes, forms, and types of biological warfare (BW) agents -- those listed under International Task Force - 21 and to warn of their presence.

Joint Biological Standoff Detection System (JBSDS). The JBSDS will be a standoff, early warning, biological detection system. The system will be capable of providing near real-time, on-the-move detection of biological attacks and/or incidents and standoff early detection and/or warning of biological warfare agent at fixed sites or when mounted on multiple platforms, including chemical, biological, radiological, and nuclear reconnaissance platforms.

Joint Chemical/Biological Agent Water Monitor (JCBAWM). The JCBAWM is a portable device capable of detecting, identifying, and quantifying chemical and biological agents by allowing the user to sample with the device and receive display readout of the water sample contents. This detection system will be capable of warning personnel of the presence of chemical and biological agents.

Joint Warning and Reporting Network (JWARN). JWARN will provide Joint forces with an integrated comprehensive analysis and response capability to minimize the effects of hostile chemical, biological, radiological, and nuclear (CBRN) attacks or accident and/or incidents. It will provide the operational capability to employ CBRN warning technology, which will collect, analyze, identify, locate, report, and disseminate CBRN threats.

medical surveillance. See “surveillance, medical.”

point detection. See “detection, point.”

presumptive detection. A generic detection component that analyzes aerosol particle contents to determine if they are biological in origin, indicating a higher probability of introduction of biological warfare aerosol. This function may also classify the suspect aerosol by broad category (e.g., spore, bacterium, toxin/macromolecule, virus) or by presence of generic markers. International Task Force-23 and North Atlantic Treaty Organization LG.7 call this function “genetic detection/identification” and states that this function “… involves the analysis of aerosol particle contents to determine if they are biological in origin (versus other particulate matter).”

quarantine. Restriction of freedom of movement of apparently well individuals who have been exposed to infectious disease, which is imposed for the usual maximal incubation period of the disease.

reconnaissance, survey, and monitoring. Reconnaissance, survey, and monitoring will determine the extent of attack and provide information to assist decision-making regarding relaxation of protective measures.

restoration. Must enhance sustainment and recovery of the joint force by rapidly returning equipment and personnel to maximum operations tempo or evacuate after exposure to chemical, biological, radiological, and nuclear or toxic industrial material contamination.

Sense. The capability to continually provide information about the chemical, biological, radiological, and nuclear (CBRN) situation at a time and place by detecting, identifying, and quantifying CBRN hazards in air, water, on land, on personnel, equipment, or facilities. This capability includes detecting, identifying, and quantifying those CBRN hazards in all physical states (solid, liquid, gas).

Shape. The ability to characterize the chemical, biological, radiological, and nuclear (CBRN) hazard to the force commander -- develop a clear understanding of the current and predicted CBRN situation; collect, query, and assimilate information from sensors, intelligence, medical, etc., in near real time to inform personnel, provide actual and potential impacts of CBRN hazards; envision critical Sense, Shield, and Sustain end states (preparation for operations); visualize the sequence of events that moves the force from its current state to those end states.

Shield. The capability to shield the force from harm caused by chemical, biological, radiological, and nuclear hazards by preventing or reducing individual and collective exposures, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment.

standoff detection. See “detection, standoff.”

Standoff Biological Sensor (SBS). SBS will provide early warning biological detection at standoff distances. The SBS will be capable of providing near real time, on-the-move detection of biological attacks and/or incidents and standoff early detection and/or warning of BW agents at fixed sites or when mounted on multiple platforms, including manned and unmanned ground, sea, aerospace vehicles, and space-based reconnaissance platforms.

Sustain. The ability to conduct decontamination and medical actions that enable the quick restoration of combat power, maintain and/or recover essential functions that are free from the effects of CBRN hazards, and facilitate the return to pre-incident operational capability as soon as possible.

surveillance, environmental health. Monitoring risks that personnel regularly come into contact with from non-aerosol biological agents through the contamination of food, water, and other items. The Services currently field teams that can test air, water, soil, flora, and fauna for endemic disease hazards. Information from these activities should be fused with traditional biological weapons intelligence and information to provide a more complete biological hazard picture, as well as to guard against non-aerosol attacks.

surveillance, medical. The ongoing, systematic collection of health data essential in the evaluation, planning, and implementation of public health practices. It should be closely integrated with the timely dissemination of data as required by higher authority. For biological defense, rapid evaluation of medical surveillance data and reporting of analyses are required from a public health perspective.

surveillance, syndromic. The collection of data concerning the signs and symptoms of patients who have sought medical care. These data are analyzed to identify abnormalities in the expected rates of illness, which may indicate a biological attack (see epidemiological analysis and detection).

technical detection. The use of point and standoff equipment to sense something in the environment.

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