TECHNICAL TRAINING

READINESS CRAFTSMAN Read-ahead Material

1 May 2006

782d TRAINING GROUP
Det 7, 366 Training Squadron
Ft. Leonard Wood, Missouri

Designed for AETC Course Use Only
Not Intended For Use on the Job

Det 7, 366 Training Squadron
(Civil Engineer Training)
Fort Leonard Wood, Missouri

HO JCACP3E971 00AA
1 May 2006

This HANDOUT (HO) was designed to guide you through your study assignments in the most logical sequence. Based on AETCI 36-2203, Technical Basic Military Training Development, the information in this workbook is an effective tool that will enhance your learning activity. Use this HO to prepare for the JCACP3E971 00AA Readiness Craftsman In-Resident course. Information in this HO will not be covered during the In-Resident course.

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2. Emergency Management (EM) Program

a. Given applicable references, explain the EM Program organizations and responsibilities with at least an 80% accuracy. STS: 8.2.1., 8.2.2., 8.2.3., 8.2.4., 8.2.5., 8.2.6., 8.2.7

EMERGENCY MANAGEMENT (EM) PROGRAM

What is Emergency Management?

To fully understand the mission of the Readiness career field in the USAF you must first understand what it is we do. Although our mission has be realigned and redirected several times over the years, the USAF finally came up with an acronym that sums it up….EM! What is EM you ask??? EM stands for "Emergency Management". The primary objective of the Air Force EM program in a nutshell, is to plan, organize, train, and equip personnel and protect critical infrastructures needed to accomplish the mission against the possibility of a Chemical, Biological, Radiological, nuclear, and Explosive (CBRNE) enemy attack, major accident, natural disaster, or terrorist use of Weapons of Mass Destruction (WMD). The overall purpose of EM is to capture the complete incident response cycle, from planning to response and recovery. The highest priorities of the program are force survivability and mission continuation which are the cornerstones of what we do. When at base level, EM is a wing-level program under the guise of Civil Engineering. The Civil Engineer Readiness Flight is charged with managing and implementing the program for the Wing Commander through the Base Civil Engineer leadership.

Emergency Management Defined

EM is defined in AFI 10-2501, *"Emergency Management Planning and Operations"* as physical threats facing military installations including major accidents, natural disasters, HAZMAT, terrorist use of CBRNE, enemy attack and broad spectrum of planning, response, and recovery actions

Due to the overwhelming superiority of our conventional weapons systems our air bases are prime targets for enemy attack. The inability of our enemies to counter our conventional advantage could force them to use asymmetrical weapons to "level the playing field." Some of these threats include hazardous materials or WMD involving the use of Chemical, Biological, Radiological, Nuclear, and High-yield Explosive (CBRNE) material; and wartime enemy attack with CBRNE weapons. Additional threats include natural disasters and major accidents.

As the terrorist attacks of September 11, 2001, Hurricane Isabel in 2003, the 2004 Tsunami disaster and the terrorist insurgency in Afghanistan and Iraq have shown us, the threats are not only real, but also very possible.

Air Staff Emergency Management Organization

To fully understand how to fully execute the mission of the Civil Engineer Readiness Airman, you must first know how the Air Force and your base are organized and their missions respectively. These organizational levels will vary depending on several factors. If you would like to know more AFPD 38-1 and AFI 38-101 explain how the Air Force is organized.

Like every large organization, the Air Force must be aligned to best utilize all available vital and possibly limited resources. To do this requires simple, streamlined structures designed for seamless transition from peace to war. The Secretary of the Air Force is responsible for organizing the Air Force and aligning it. The Air Staff, under the direction of the Chief of Staff of the Air Force, discharges this responsibility. Finally the Headquarters US Air Force (HQ USAF) or better know as the Air Staff and the major commands that form the backbone of the Air Force work toward meeting Air Force organizational goals

The HQ USAF or Air Staff as it is most commonly referred to is responsible for the policy oversight and advocacy of Air Force capabilities for consequence management. This will include sustainment, recovery and restoration operations at air force installations at home or abroad. HQ USAF also identifies mission critical cyber and physical infrastructures, infrastructure vulnerabilities and methods to remediate, recover and sustain infrastructures in peace and wartime. The Secretary and the Air Staff will interpret portions of the DoD readiness policy that requires Air Force, MAJCOM or unit implementation.

Although at the top of the Air Force, The Chief of Staff will not perform the Full Spectrum Response Program responsibilities directly. The responsibilities of the EM program have been delegated to the USAF/IL director of Installation and Logistics and the USAF/XO or better known as the Director of Operations as they are depicted on the next slide. It is important to keep in mind that although there are only two deputies listed, there are many more that make up the Air Staff function. The two listed are the ones directly responsible for the execution of the EM program. For a complete listing refer to AFI 38-101. See Figure 2-1

Figure 2-1

NOTE: The illustration depicts two Deputy Chiefs of Staff. For a complete listing refer to AFI 38-101.

HQ USAF/ILE

The first deputy listed is the AF/IL. Although the AF/IL is listed as an executor of the EM program, actual responsibility falls under the AF/ILE better know as The Civil Engineer. The CE as it is usually referred to, provides commanders with the policies, authorities, resources, and technical support they require in the areas of Installation Engineering, Expeditionary Engineering, Environmental Leadership, Housing Excellence, and Emergency Services.

Besides overseeing the EM program, the CE also supports commanders by developing, managing and advocating policy, guidance, and resources for Civil Engineer information systems such as the Automated Civil Engineer System (ACES). It also oversees the Headquarters Air Force (HAF) Geo Integration Office (GIO) which is responsible for Air Force-wide adoption of geospatial technologies that provide installations with the organic capability to access, maintain, and exploit "one map" to satisfy installation requirements.

They coordinate all engineering policies, plans, programs and budgets, close to $11B, to support the AF physical plant, real property maintenance, base operating support and military construction, family housing, outsourcing and privatization. They are the focal point for congressional actions, long-range planning, base realignment and closure (BRAC) planning and programming. Air Force ILE also provides analysis of basing options to CSAF for bed-down of new weapons systems and realignments, unit moves and non-AF organizations requesting bed-down on AF real property. They also oversee the delicate environmental planning activities for the Air Force.

Along with infrastructure they are responsible for the preparedness and war-fighting capability of Prime Base Engineer Emergency Forces (BEEF), Rapid Engineer Deployable Heavy Operational Repair Squadron, Engineer (RED HORSE), firefighters,

readiness, and explosive ordnance disposal personnel. The main support for EM is that they serve as the focal point for CBRNE passive defense training and operations for all AF personnel.

AIR FORCE CIVIL ENGINEER READINESS COUNCIL

The Air Force Civil Engineer Readiness Council or CERC provides strategic direction to the Prime BEEF and EM programs. The council is chaired by The Air Force Civil Engineer with members coming from the Civil Engineers of each MAJCOM, the ANG, and the Commander, HQ AFCESA which act on recommendations from The Readiness Board. The Council approves RD&A and establishes and maintains support of deployment operations.

HQ USAF/ILEX

Underneath the AF/ILE is the AF/ILEX directorate or better know as the Readiness and Installation Support Division. The section is directly responsible for overall EM program policy and direction. They publish EM policy and guidance and establish training program and equipment requirements for units and individuals. ILE provides CBRNE passive defense program oversight and advocates for CBRNE passive defense projects and acquisition to include the incorporation of federal HAZMAT emergency planning and response requirements into EM plans and programs. They Co-Chair the Civil Engineer Readiness Board (CERB) and CBRNE Panels with HQ AFCESA and are responsible for standardizing baseline force structure, training and equipment list for response throughout the Air Force

HQ USAF/XO

Along side the Installations and Logistics Deputy is the Deputy Chief of Staff for Air & Space Operations or HQ AF/XO. The XO defines and advances the nation's air and space power, from concept to capability, providing coherence in operational requirements, policies, plans, programs and support for the war-fighter. As the focal point for Air Force CBRNE activities and initiatives, they are responsible for AT/FP initiatives, Defensive Counter-information (DCI) events, MSCA and command post operations The Operations directorate integrates critical EM operational preparedness policies and procedures into expeditionary operations, revising reporting, security and force protection requirements. They coordinate staff functional inspection criteria and ensures inspection criteria is compatible with SAF/IG inspection policy

As an advocate for EM Program assets and support, they are responsible for integration of AT/FP and full spectrum threat vulnerabilities into mission needs statements (MNSs), functional directives and publications and cross-functional operations plans (OPLANs). They provide guidance for contingency and deliberate planning, and can activate the Air Force Contingency Support Staff and AFOSC - the USAF 24-hour point of contact for EM and MSCA operations. Under the XO, the integrated policies for all aspects of Counter-Nuclear, Biological and Chemical (C-CBRNE) Operational Preparedness, Homeland Security, Military Support to Civil Authorities, Force Protection, Information Warfare and Intelligence information sharing with appropriate Department of Defense and civilian agencies are established.

HQ USAF/XOH

Underneath the XO supporting the EM program is the Directorate of Homeland Security or AF/XOH. While supporting the EM program, XO conducts the development of policy, guidance and operational expertise for Headquarters Air Force Homeland Security (HLS). This will include homeland defense and military support to civil authorities. They are also responsible for advocating and integrating HLS into operations, plans and programs. They are the Air Force HLS focal point for interactions with the White House Office of HLS, OSD, Northern Command and additionally Joint Staff and lead federal agencies. XO also establishes policies and guidelines for supporting Air Force homeland security (including homeland defense and civil support), with policies and guidelines for supporting critical infrastructure protection (CIP). The XO serves as the Air Force Director of Military Support (DOMS) to coordinate and facilitate oversight with DOMS and each service of domestic support operations (DSO).

HQ USAF/XON

Like XOH, the Directorate of Nuclear and Counter-proliferation (AF/XON) supports AF/XO in all counter-proliferation activities. AF/XON develops Air Force C-CBRNE doctrine, strategy and policy while developing and maintaining an Air Force C-CBRNE investment strategy. Under this directorate falls the responsibility to define Air Force C-CBRNE requirements to include the assessment of Air Force C-CBRNE capabilities. XOH also attends appropriate C-CBRNE panels and committees, and in appropriate intra-DoD and inter-governmental counter-proliferation forums to ensure Air Force compliance with USG, DoD and Air Force counter-proliferation policies is met.

HQ USAF/XONP

The National Security Policy Division or AF/XONP is the office of primary responsibility for Air Force counter-proliferation and C-CBRNE policies. Under XONP falls the coordination on all Air Force actions related to counter-proliferation and C-CBRNE doctrine, strategy, policy and guidance procedures. In this capacity, XONP supports

development of Air Force C-CBRNE doctrine, policy directives and instructions, reviews other agencies' counter-proliferation policies, instructions and incorporates C-CBRNE operations into all capabilities based planning. They also support and coordinate on revisions to C-CBRNE standards, reporting procedures and inspection criteria. XONP serves as the Air Staff liaison with the Air Force Doctrine Center on counter-proliferation issues.

As one of many major players in the EM program they chair the Air Force Counter-proliferation-Integrated Process Team (CP IPT). XONP supports Air Force C-CBRNE requirements in appropriate Air Force, Joint and OSD forums. As a representative of the Air Force on the JCS Strategic Deterrence Joint War-fighting Capability Assessment (JWCA) and the OSD Counter-proliferation Program Review Committee (CPRC), they influence national security policy conferences to advance Air Force concepts and capabilities where appropriate.

HQ AFCESA/CEX

As the brain trust for the AF EM execution, HQ AFCESA provides cross sectional technical expertise to the Air Staff, MAJCOMs, the RDnA, test, and acquisition communities, and other military services on EM issues. They also provide a representative and liason to the *NBC Defensive Measures*, *Aerospace Medicine, Life Support and Aircrew Systems* and to the NATO Inter-service CBRNE Working Party.

As the main source of policy and guidance for EM, HQ AFCESA makes recommendations for inputs to the EM and AT/FP related MNS as well as develops CBRNE, Battlespace Information Management (BIM) and other EM-related Mission Area Analysis and Mission Needs Analyses (MAA/MNA).

HQ AFCESA is also the responsibility party for assessing the results for Analysis of Alternatives (AOAs). They monitor ORDs, JMNSs and the JCBRNED POM to ensure needs, capabilities and deficiencies are clearly addressed across the doctrine, organization, training, manpower, leadership and facilities spectrum. HQ AFCESA must review war and contingency planning documents to ensure they address EM cross-functional issues and program requirements as well as coordination with HQ ACC/CEX and Human Systems Wing, Chemical/ Biological Defense Systems Division. This ensures information and user requirements are communicated correctly (i.e., Joint MNSs and Joint ORDs). Reviews all EM-related AFTO Form 22, *Technical Order System Publication Improvement Report and Reply*, submissions and recommends changes to EM allowance standards to the appropriate Air Logistics Center.

As the lead for EM related information, HQ AFCESA compiles data from lessons learned reports, modifies Air Force guidance as required and submits selected lessons learned for publication in *TIG Brief.* HQ AFCESA develops important *Agency-Grams* or

A-Grams to inform the Air Force community of various issues affecting operations, equipment and policy implementation. They serve as the Air Force OPR for EM-related publications, CONOPS and visual aids to ensure MAJCOMs develop training programs meet objectives. AFCESA monitors formal training through HQ AETC and provides guidance on other US/DoD agencies and allied forces training courses. They actively participate in the Air Force PDWG. As the EM focal point, they provide support to global EM contingencies, through the HQ AFCESA CE Readiness Operations Center, using the Air Force Contract Augmentation Program (AFCAP). Per their policy and guidance mandate, they develop EM, WMD and CBRNE Defense training products and conduct EM, WMD, and CBRNE Defense training and exercise, studies and analysis

MAJCOM/ANG

The next level of authority after HQ USAF is the Major Command (MAJCOM). Each MAJCOM will have a EM program which are outlined with specific responsibilities. Under these responsibilities, each MAJCOM will have a Functional Area or FAM

The command CE is the MAJCOM EM program agent and designates a MAJCOM Office of Primary Responsibility (OPR). The OPR or Functional Area Manager ensures the command meets objectives in AFPDs 10-25 and 10-26 while participating in the Air Force PDWG (if required). The FAM is also responsible for command EM programs, plans and agreements and provides AT/FP program assistance to ensure plans reflect full-spectrum threat vulnerabilities, They are tasked to establish a command Disaster Support Group (DSG) which they can activate for EM contingencies. The MAJCOM FAM develops, coordinates and publishes command directives, CONOPs, and guidance for implementing the EM program as well as providing the EM Plan 10-2 command guidance. They must ensure agreements meet local, state and Status of Forces Agreement (SOFA) requirements to include defining training and exercise requirements.

The FAM establishes a EM planning program at each installation and designates the CE Readiness Flight as the organization to support planning, response to EM incidents and training; and ensures installations are capable of defending, mitigating and recovering from peacetime and wartime contingencies

The FAM also establishes, identifies, defines, and quantifies requirements to execute Readiness Flight programs. They must prioritize, budget for and allocate Readiness Flight Equipment to plan, budget, and procure DP and CBRNE defense supplies and equipment for their respective commands. They also Identify command Readiness Flight equipment requirements and operations, training, as well as exercise planning needs. The FAM coordinates critical command plans and agreements and Identifies and defines program operational concepts and requirements.

The FAM is also responsible to ensure operational and training activities comply environmentally. Each MAJCOM FAM must establish frequency, duration, and requirements for refresher training based on command guidance. Develops quality assessment criteria used during the command inspection program.
The overseer of command DP IMA program for manning issues, reviews the required training standardization to establish command requirements for formal training. The FAM is also required to develop the criteria for the MAJCOM exercise and evaluation program. They are a leading participant in the CE Readiness Working Group.

Specific MAJCOM RESPONSIBLITIES:

Air Combat Command (ACC)

As the largest war fighting command, HQ Air Combat Command (ACC) has a lions share of the EM mission: This include coordination with Air Mobility Command (AMC) concerning air mobility recommendations for joint mission need statements (JMNS) and joint operational requirement documents (ORDs) to the Air Force PDWG and HQ AFCESA/CEX. HQ ACC must maintain and ensure the Air Force RTF for radiological events within the CONUS, Puerto Rico or US Virgin Islands is fully equipped and trained. They are responsible to outline the duties and responsibilities of the RTF in ACC Plan 32-1, *CONUS Radiological Accident/Incident Response and Recovery Plan*.

HQ ACC will serve as the Air Force Lead Command for the Agile Combat Support Mission Area Plan and as such is the lead for RD&A initiatives to include making recommendation for acceptance or rejection of equipment and procedures. Responsible to coordinate with HQ AFCESA/CEX to ensure concepts of operations, implementation plans, fielding and sustainment guidance, tactics, techniques, and procedures along with Air Staff policy (through AF/ILEX) are developed to support all new CBRNE defense programs. ACC participates in OT&E of proposed airlift specific CBRNE defense equipment and procedures and provides test results to HQ USAF/ILEXR, HQ AFCESA/CEX, HQ ACC/DRWC and HQ ACC/CEXA for implementation. They also function as the MSCA tasking authority for CONUS Air Force assets not assigned to a unified or specified command. Under HQ ACC, The medical directorate or SG is responsible for developing the Concept of Operations for the medical portion of the EM and provides representation to the AF CERB CBRNE Panel

Air Mobility Command (AMC)

As the mover of equipment and people for the AF, HQ Air Mobility Command (AMC) has a large responsibility under the EM program. They participate in the initial OT&E of chemical-biological warfare defense equipment and procedures pertaining to airlift, air refueling and air mobility support operations. HQ AMC coordinates with ACC on air mobility recommendations for JMNS and joint ORDs to the Air Staff PDWG, HQ AFCESA/CEX and AF/SGR. They provide airborne survey platforms for DoE

observation over areas affected by a nuclear weapons accident. HQ AMC will notify the initial response base (IRB) and RTF of T.O. 11N-20-11(C) line number and weapon quantities immediately after an incident involving an AMC aircraft carrying nuclear weapons. They also provide the development large frame aircraft decontamination guidance and ensures the civil reserve air fleet (CRAF) and airlift contractors have ground crew IPE, when supporting deployments to high threat CB areas. AMC also provides doctrine, policy, TTPs and resources for aerovac of CBRNE casualties and provides audiovisual documentation of passive defense operations for joint mission need statements and joint operational requirements.

Air Force Material Command (AFMC)

Under HQ Air Force Materiel Command (AFMC) is the responsibility for the *Multi-Product Emergency Response Plan for Inhalation Hazards* for US Air Force shipments of nitrogen tetroxide. AFMC coordinates commercial contractor technical escort teams for hazardous shipments and provides radioactive and mixed waste disposal expertise. They are the parent MAJCOM of the 311 Human Systems Wing and its subordinate unit the Air Force Institute for Environment, Safety and Occupational Health Risk Analysis (AFIERA). AFIERA is the pilot unit of the Air Force Radiation Assessment Team (AFRAT). Under HQ AFMC guidance, AFRAT's uses their capabilities which include field monitoring, bioassay, dosimetry and risk assessment for incidents involving radioactive materials

Air Force Special Operations Command (AFSOC)

Aligned under the Special Operations community is HQ Air Force Special Operations Command (AFSOC) Under this alignment AFSOC supports OT&E decontamination procedures for Special Operations Force (SOF) C-130s and rotary-winged aircraft. They develop JMNS and ORDs to support special operations requirements for transportation and handling of WMD materials in support to the Combatant Commander and SECDEF. They must coordinate with US Special Operations Command (USSOCOM) on development of Joint SOF CBRNE programs having USAF applicability to include aircrew life support (DOTL) equipment and its compatibility with unique Special Operations aircraft and their CONOPS which supports USSOCOM and USAF mission requirements

Pacific Air Forces (PACAF)

In the Pacific hemisphere HQ Pacific Air Force (PACAF) implements Air Force RTF when directed by Pacific Command (PACOM) which is joint in nature. PACAF coordinates on cold weather operations for EM and provides logistical support to the AFOTEC for cold weather field operational tests and evaluations. Primary C-CBRNE mission is to organize, train and equip forces to plan, conduct and coordinate offensive aerospace operations in the Pacific.

Air Forces in Europe (USAFE)

In the European Theatre, HQ United States Air Forces in Europe (USAFE) is responsible to implement Air Force RTF procedures, as part of an incident response, when directed by the Joint European Command or EUCOM. They must ensure successful implementation of response procedures in Commander USAFE (COMUSAFE) CONPLAN 4367, Mobility Equipment Force Packaging (MEFPAK) for the registered Unit Type Code (UTC) In-Place Patient Decontamination Team.

Air Education and Training Command (AETC)

HQ Air Education and Training Command (AETC) implements the EM training concepts into Air Force courses as applicable

Air Reserve Command (AFRC)

HQ Air Force Reserve Command (AFRC) coordinates with ACC and AMC on air mobility recommendations for joint mission need statements and joint operational requirements to the Air Staff PDWG and HQ AFCESA/CEX. They are also responsible to ensure AFRC personnel are trained and equipped according to AFI 10-2501

Space Command (AFSPC)

HQ Air Force Space Command (AFSPC) supports HQ ACC actions in response to incidents involving intercontinental ballistic missiles and other applicable assets

DUR/FOA

Even though the DRU and FOA organizations do not directly fall under a parent MAJCOM, the still are responsible to ensure unit specific EM programs, plans and agreements meet objectives in AFPD 10-25, *Emergency Management Planning and Operations.* They also must provide AT/FP program assistance to include ensuring plans reflect full-spectrum threat vulnerabilities and include mission-oriented protective posture (MOPP) provisions. Ensuring agreements meet local, state and SOFA requirements to include defining training and exercise requirements is also a responsibility of the DRUs and FOAs.

NAF

Although aligned under the MAJCOM, the NAF is a tactical echelon that provides operational leadership and supervision to a base or unit. This is not a management HQ and do they not have complete functional staffs. NAF's are responsible for MAJCOM operations in a specific geographic region or theater of operations. NAFs can possibly have different responsibilities amongst commands and under the AFRC system.

BCE

The Base Civil Engineer or BCE is responsible to implement installation-level EM programs. Under this responsibility they are required to participate in the continual risk assessment of installation EM threats and vulnerabilities, in conjunction with the AFOSI, SF, and TWG. To complete this task they communicate the emergencies and disasters threatening the installation by identifying and quantifying EM risks. They accomplish this task by providing the direction and guidance through the installation Readiness Board

READINESS FLIGHT (CEX)

The CE Readiness Flight is one of eight flights in the CE Squadron. The CE squadron is under the Mission Support Group (MSG) and each wing or installation has four groups composing the Wing MSG, Operations Group, Medical Group and Maintenance Group.

SUPPORTING AGENCIES

There are also several supporting agencies composing the installation EM program. The first is the Planning and Management Element and the second is the Disaster Response Force or DRF.

The planning and management element includes the EM Program Manager, Readiness Board (RB), Exercise Evaluation Team (EET) and the Unit Program

Disaster Response Force (DRF)

The Disaster Response Force or DRF responds to all EM incidents and is the operational side of the supporting agencies. The DRF is composed of the command post and Survival Recovery Center(SRC), Disaster Control Group (DCG), Unit control Centers (UCC), support and recovery teams and emergency services (to include Fire, Medical and Security Forces). The emergency services responders integrate the incident command system (ICS) to the maximum extent possible within the framework of the overall response effort for major accidents, natural disasters and terrorist use of

WMD. The DCG will continue transitioning continental United States (CONUS) response organizations to also fit into the overall ICS framework. The support and recovery teams are any teams that support the overall EM program. DCG response consists of two response elements the DRF and IRE.

Under the DRF, The Initial Response Element (IRE) is deployed immediately to the disaster scene to provide command and control, save lives and suppress and control hazards. This element performs rescue, site security, fire fighting and medical procedures. The senior fire official takes control of the response scene until relieved by the responding DCG commander.

Also falling under the DRF The Follow-on Element (FOE) is a response element that consists of the DCG, support and recovery teams and other support forces. They deploy to the incident (if requested) after the IRE to enhance command, control and communication. The DCG responds to peacetime major accidents and natural disasters. The DCG provides on-scene command, control and communications of military resources, as well as, cross-functional expertise. The DCG coordinates operations and support requirements with the installation and provides liaison with civil authorities and response elements.

3. Installation Organization Planning and Management

a. Given applicable references, explain facts about the installation organization planning and management with at least an 80% accuracy. STS: 8.3.1, 8.3.2.

INSTALLATION PLANNING AND MANAGEMENT

Planning and Management Orgainzation

The Readiness Structure is a multi-tiered structure consisting of MAJCOMs and Installations. It provides those MAJCOM and installation commanders with the capability to review and evaluate the readiness program and contingency operations issues from a corporate point of view.

The MAJCOMs each utilize the Readiness Council and the Readiness Board format to manage readiness issues for their respective command level.

The installations will establish an Installation Readiness Board encompassing functionality from the MAJCOM Readiness Council framework, with the installation commander as chair, and an installation Readiness Working Group.

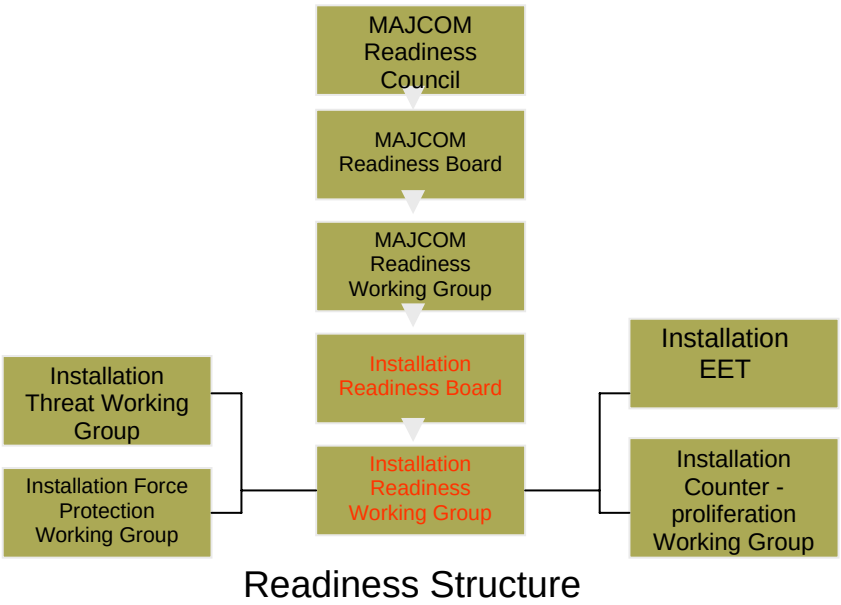


Figure 3-1

Installation Readiness Board

The Installation Readiness Board is the executive committee responsible for the total installation's readiness and contingency functions. As a decision-making body, the board applies the Readiness Board's collective judgment and experience to command issues within its authority and implements Air Force policy on all-hazard full-spectrum threat concepts for sustaining operations. In addition, the Readiness Board uses command definitive guidance found in DoD, Air Force, MAJCOM, and other federal agency publications as a basis, to formulate decisions and recommendations. This structure needs to incorporate those, local and regionally, required planning committees, councils, or groups, as specified by federal, state or local agencies (i.e. EPA's Local Emergency Planning Committee, FEMA's Emergency Management Council, etc.). In OCONUS, those same local considerations apply with Department of State, the theater Commander of a Combatant Command and host nation agreements, providing additional input requirements for the Readiness Board. The Readiness Board acts as the forum to receive and pass strategic full-spectrum threat readiness and contingency issues onto the MAJCOM RWG, as appropriate for their resolution.

Readiness Board Members

Members are appointed by the installation commander and are typically installation staff members and any other installation unit commanders as directed by the wing

commander (essentially mirrors the counterparts of the composition of their MAJCOM Readiness Board membership).

Readiness Board Meetings
Installation Readiness Board Meetings are held at a minimum semiannually, at the call of the Installation Commander, at the request of a member of the Readiness Board or as required.

Normal Agenda Items
Suggested Readiness Board Topics of Discussions include the following:

- Status of wing-wide FSTR-related training, such as NBCC Defense, AT/FP, HAZMAT, support and recovery teams and QNFT.
- The results of FSTR exercises including status of response capability.
- The status of protective equipment to include budget and funding for mobility bags assets and shelters for the unit and additive forces, where appropriate.
- Results of vulnerability analysis' including installation shortfalls concerning NBC attacks, terrorist use of WMD, Force Protection, HAZMAT, etc.
- The status of NBCC Defense initiatives and procedures affecting the installation.
- Comparison of validated requests for READY program support, for home station and/or deployed operations, in relation to available manpower.
- The results of MAJCOM and unit FSTR SAVs.
- Other items of interest relevant to the installation FSTR program.

These topics may be modified to tailor installation requirements.

Installation Commander

The Installation Commander presides over the meetings and has final decision authority for issues brought to the RB for resolution. The Commander will:

1. Convene and guide the operation of the RB.
2. Issue guidance and procedures to the Installation Units and members of the RB.
3. Ensure information, briefings and reports are received from MAJCOM, RWG, Installation TWG, installation EET and other tasked integrated process teams.
4. Review Unit SAV reports, CBRNE equipment status, SORTS reports and installation readiness training attendance reports prior to the RB meeting.
5. Approve annual IPE budget.
6. Elevate issues to the MAJCOM RWG when additional guidance and/or resolution for issues beyond the scope of the installation to resolve.
7. Ensures accuracy, compliance, and timeliness of Readiness and Contingency Capabilities briefings and GSORTS reporting.

CE Readiness Flight Officer

The CE Readiness Flight Chief (or equivalent) will; organize, schedule and coordinate all aspects of the Installation RB meetings, and record and distribute minutes of the Installation RB meeting.

Readiness Working Group Function

The RWG performs staff work to develop alternatives and recommendations for presentation to the RB. The RWG merges all teams and groups addressing readiness and contingency issues into a unified format for effectiveness and efficiency of effort. It performs initial review, analysis, and prioritization of programs, initiatives, and recommendations to the RB. The RWG is the installation commander's method to assure integration of cross-functional full-spectrum threat concept issues, planning/threat process and training/exercise initiatives fall within DoD and Air Force compliance. The RWG also directs and oversees all installation units' Readiness and Contingency programs by addressing training/exercise/evaluation criteria, monitoring SAV reports, unit
GSORTS DOC statements and resource/equipment issues. The working group members must prebrief their respective RB member prior to any RB meetings. The agenda addresses the following areas, as required: policy/procedural guidance; training; exercise/evaluation criteria; equipment; readiness reporting and those areas recommended by other working groups and integrated process teams with readiness and contingency concerns/issues.

Readiness Working Group Membership

The installation commander will appoint and approve membership changes after discussion among RWG members. The co-chairs establish working subgroups, as necessary. The RWG representatives are an integral part of the Air Force cross-functional full-spectrum threat readiness and contingency process, whose charter is to work programs from a corporate Air Force perspective rather than from a particular functional director's view. Other than the appointed members, representatives may be invited from other civilian agencies, from time to time, to discuss issues from their respective functional areas or localities. Suggested members of the RWG include CE Readiness, Services, Security Forces, Wing IG, AFOSI, EOD (if assigned), Communications, Operations, Plans and Programs (XP), Medical, ARC tenants and any other organization as required.

Readiness Working Group Co-Chairman

The co-chairman will:

- Preside over meetings and make recommendations to the RWG, retaining final decision authority for issues brought for resolution, and for all recommendations forwarded to the RB.
- Reviews and coordinates with the installation commander the daily all risk/threat assessment briefing, GSORTS input and readiness/contingency capability reports.
- Approves the agenda for each meeting.
- Tasks staff organizations for after-action reports and briefings.
- Provides oversight and tasking authority to various sub-working groups.
- Appoints the CE Readiness Flight chief for administrative responsibilities.

Readiness Working Group Administrative Responsibilities

The CE Readiness Flight Chief will:

- Organize, schedule and coordinate all aspects of the RWG meetings.
- Record and distribute minutes of the RWG meeting.

Readiness Working Group Chief Wing Plans

Chief, Wing Plans will convene all appropriate RWG members as necessary to establish or review C-1 bag and sustainment Individual Protective Equipment requirements and other CB equipment requirements against mobility taskings and authorizations. As needed, this group will recommend allocation of mobility bags/CB equipment for host, tenant and geographically separated units based on real world deployment tasking and planning priorities.

Readiness Working Group Meetings

The RWG will meet quarterly, and as required by the installation commander, or at the request of an organization from the RB staff.

4. Installation Response Organization

a. Given applicable references, explain facts about the Disaster Control Group (DCG) with at least an 80% accuracy. STS: 8.4.4

INSTALLATION RESPONSE ORGAINIZATION

Installation AF EM Organization Structure

In this objective we will cover information about the installation response organization. At the installation level, the response organization is the disaster response force. The DRF is made up of the disaster control group, the installation command post (and all its sub-elements such as the survival recovery center and contingency support staff, unit control centers, and specialized teams

Figure 4-1

DCG Function

The Air Force uses the installation DCG for initially responding to peacetime major accidents and natural disasters. It provides for on-scene command and control of military resources and functional expertise

Figure 4-2

Figure 4-3

The DCG coordinates and directs operations and support requirements with the command post, unit control centers, specialized teams, and coordinates with civil and governmental authorities

DCG Facts

Primary and alternate functional representatives are required. Primary representatives should be organization commanders or chiefs; alternates should be functional experts delegated the same authority as the primary representative.

DCG Composition

Composition and responsibilities vary with the resources, capabilities, and mission of each installation. Responding functional representatives perform duties inherent to their specific mission. If support requests exceed the capability of the installation, requests should be sent to higher headquarters.

The following is the recommended composition for the DCG:

- On-Scene Commander
- Civil Engineer
- Fire Department
- EOD
- Security Forces
- Medical Group
- Bioenvironmental Engineering
- Maintenance
- Munitions
- Logistics Readiness Squadron
- Staff Judge Advocate
- Public Affairs
- Communications
- Safety
- Weather

This recommended list comes from AFMAN 32-4004.

4. Installation Response Organization

b. Given applicable references, explain facts about the concepts and composition of various Readiness command and control elements with at least an 80% accuracy.
STS: 8.4.6.1.1., 8.4.6.2.1., 8.4.6.3.1., 8.4.6.4.1., 8.4.6.5.1.

COMMAND AND CONTROL ELEMENTS

This list is the specific Readiness command and control elements that we will cover:

- Command Post
- CAT/BS/WOC
- SRC/EOC
- Contingency Support Staff
- CBRNE Control Center
- Unit Control Centers
- Unit Control Centers (Wartime)
- Unit Control Centers (Peacetime)

Command Post

The command post directs actions in support of the installation's assigned mission. As the focal point for base wide notification and operation, it receives and sends orders, information, and requests pertinent to the assigned task. (The SRC or CSS may be used in lieu of the command post.) Other responsibilities include:

- Maintaining notification rosters and notifying DRF members and elements not on the secondary crash net.
- Overall responsibility for ensuring the installation warning system is in place and functional.
- Briefing the installation commander and staff on the status of operations.
- Disseminating information to, and collecting information from unit controls and the mobile command post.
- Assist in directing actions in support of the installation’s assigned mission during disaster/ contingency operations by maintaining notification rosters; disseminating information to, and collecting information from UCCs and shelters; and coordinating information for reports with the SRC and DCG.
- Monitor NBC detection and identification systems when traditional operators are not manning UCCs on a 24-hour basis.
- Direct actions in support of the installation’s assigned mission.
- As the focal point for installation-wide notification and operation, it receives and sends orders, information and requests pertinent to the assigned task.

CAT/BS/WOC

Your Installation Commander is responsible to establish a primary and alternate SRC or equivalent (i.e., Battle Staff, Crisis Action Team) during contingencies..

The WOC is the top echelon of airbase CBRNE defense operations and is led by the senior Air Force commander. The primary focus of the WOC is flight operations, airbase security, and support to other forces on the airbase. The WOC battle staff includes senior officers from the operations, maintenance, mission support, and medical groups. Members of the wing special staff or senior officers representing major tenant units or host-nation forces may also be present. The battle staff supports the wing commander by assessing the situation, determining mission priorities and defensive actions, and directing subordinate units.

Effective response requires a team effort since most NBCC defense countermeasures and response actions have far-reaching impact on mission accomplishment and sustainment. The direction provided by the wing commander and staff integrates actions of all wartime functions. This integration requires direct input and feedback from other command and control centers such as the base defense operations center, air defense element, and host-nation or coalition forces command posts. A typical wartime command and control structure is shown here in figure 4-5.

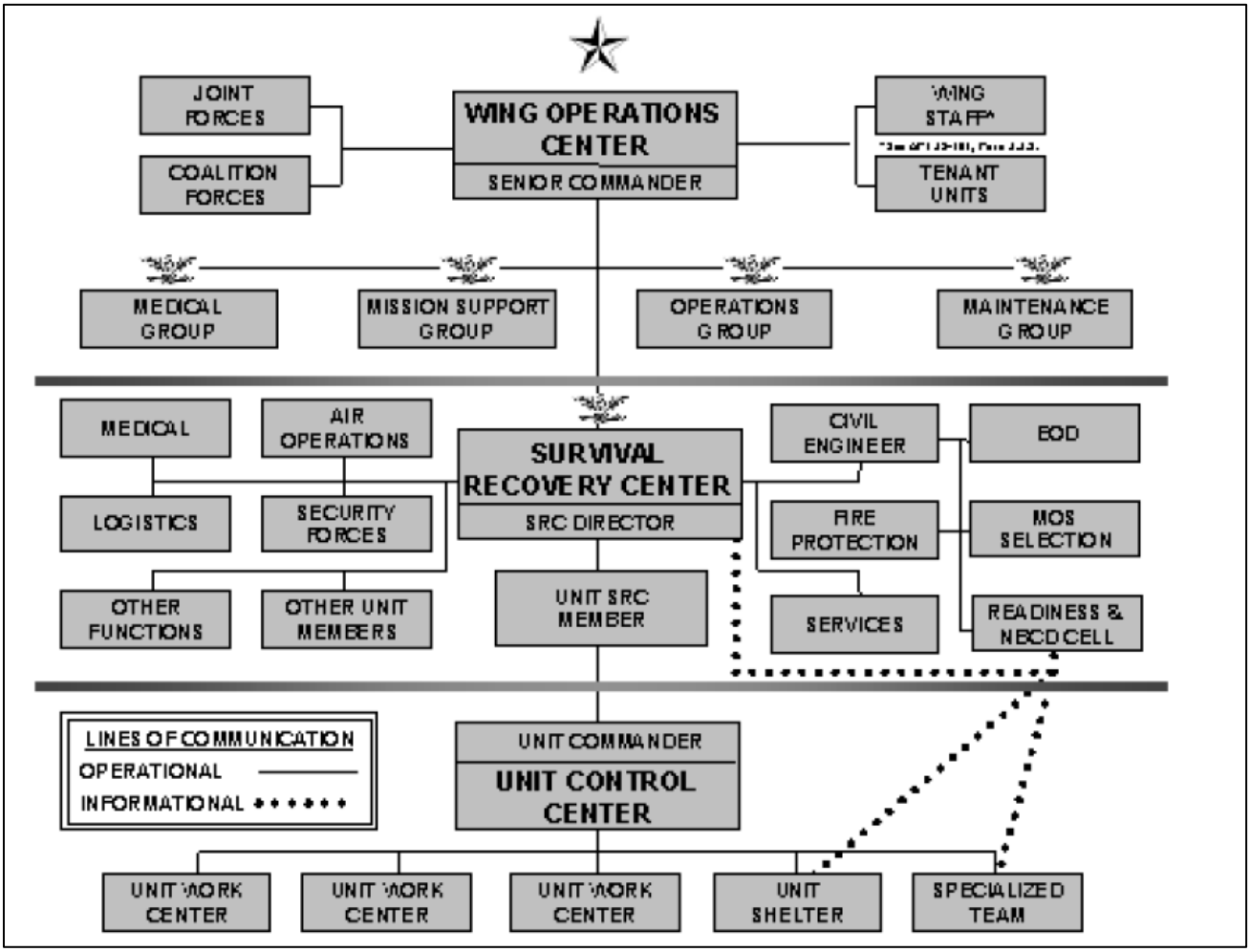

JOINT FORCES
COALITION FORCES
WING OPERATIONS CENTER
SENIOR COMMANDER
WING STAFF
TENANT UNITS
MEDICAL GROUP
MISSION SUPPORT GROUP
OPERATIONS GROUP
MAINTENANCE GROUP
MEDICAL
AIR OPERATIONS
SURVIVAL RECOVERY CENTER
SRC DIRECTOR
CIVIL ENGINEER
EOD
LOGISTICS
SECURITY FORCES
FIRE PROTECTION
MOS SELECTION
OTHER FUNCTIONS
OTHER UNIT MEMBERS
UNIT SRC MEMBER
SERVICES
READINESS & NBCD CELL
LINES OF COMMUNICATION
OPERATIONAL
INFORMATIONAL
UNIT COMMANDER
UNIT CONTROL CENTER
UNIT WORK CENTER
UNIT WORK CENTER
UNIT WORK CENTER
UNIT SHELTER
SPECIALIZED TEAM

Figure 4-5

SRC/EOC

Normally the Mission Support Group Commander assumes the responsibility of overseeing the operation of the SRC.

Figure 4-6

The SRC responsibilities include gathering information, directing, and monitoring execution of the installation CBRNE defense survivability, recovery, and sustainment operations. The SRC will also collect, analyze, prioritize, display, and report information on the status of the base. It recommends courses of action and executes pre-planned and WOC-directed actions. The SRC objective is to concentrate resources and expertise at the right place and at the right time to implement the commander's direction.

Your best choice for SRC location is to collocate the SRC with or near the WOC to permit the battle staff access to SRC displays, allow rapid exchange of information, and ensure close coordination of the pre-, trans-, and post-attack actions. Especially since the SRC is the nerve center for airbase ground operations and attack protection and recovery operations. SRC membership varies with base mission but normally includes representatives or designated points of contact from each major functional area as well as tenant and host-nation liaison forces. Representation for a typical primary and alternate SRC at a high threat area base is shown on figure 4-7.

Table 4.1. SRC Organization and Manpower (Per Shift).

Function or Representative	Primary SRC		Alternate SRC	
	Required	Desired	Required	Desired
SRC Director	1		1	
Administration	2		1	2
Air Operations (Including Aircrew Life Support)	2		2	
Medical	2		2	
Security Forces	1		1	
Judge Advocate	1		1	
Civil Engineer	1		1	
Explosive Ordnance Disposal	1		1	
Civil Engineer Readiness and NBC Defense Cell	3	5	2	
Minimum Operating Strip Selection Team	1	2	1	2
Fire Protection	1			1
Vehicles	1			1
Communications	1		1	
Services	1			1
Supply		1		1
Munitions		1		1
Personnel		1		1

Figure 4-7

Contingency Support Staff

The Contingency Support Staff is a command and control element of the command post. It consists of the commander and designated staff members and is interchangeable with the survival recovery center.

CBRNE Control Center

The Chemical, Biological, Radiological, Nuclear and High-yield Explosive (CBRNE) Control Center is responsible for providing the SRC Commander information pertaining to detected hazards and duration of the hazard. The CBRNE Control Center is also responsible for receiving NBC reports from other locations. They are also in charge of evaluating the reports and notifying the SRC of any threat to the base. This control center should be staffed with two Readiness personnel with at least one person being a 3E971 or a 3E991. This job consists of directing and monitoring the specialized teams and running the NBC Warning and Reporting System (NBCWRS). To prepare the

CBRNE Control Center ensure lines of communication with your specialized teams and UCC's exist. You must also have procedures for linking communication with all necessary agencies (to include host nation and sister services), both on and off base in your control center.

Unit Control Centers

For descriptive purposes we are going to divide Unit Control Centers or UCCs into wartime and peacetime. Their basic purpose, to provide a unit focal point within an organization to monitor unit resources and mission capability and to coordinate their activities, is the same for both.

Figure 4-8

Figure 4-9

- Unit Control Centers (Wartime) During wartime most units are required to maintain a UCC or an equivalent command and control function. The UCC provides rapid attack warning to all assigned or attached unit personnel. It maintains the status of unit activities and a permanent log of unit actions. The UCC passes information to and from the SRC and directs and monitors the implementation of unit pre-, trans-, and post-attack actions. UCCs maintain a base map with unit areas of responsibility, structures, shelters, bunkers, and primary operating areas color coded or marked to enable quick identification. UCC checklists outline tasks and responsible unit functions under each alarm condition. Following attacks, the UCC directs unit Post Attack Reconnaissance operations, reports post-attack hazards, and coordinates recovery actions.

- Unit Control Centers (Peacetime) Peacetime control centers vary depending on the resources, capabilities, and mission of each installation. They are only required for the elements comprising the DCG. Responsibilities parallel those of the DCG representatives.

- **Unit control centers should also:**

- Provide a focal point within an organization to monitor unit resources and mission capability and to coordinate their activities during disaster operations.
- Maintain emergency response checklists, disaster response maps, communications equipment, alternate control centers, and recall rosters for assigned DRF elements.
- Operate continuously during emergency response operations.
- Alert, recall, deploy, and supervise organizational DRF elements.
- Disseminate threat and emergency action information, disaster cordon evacuation instructions, protective measures and other emergency information to all organizational elements.
- Evaluate and report damage, casualties, and mission capability.
- Maintain a log of events to document emergency response actions.

4. Installation Response Organization

c. Given applicable references, explain the principles of specialized teams with at least an 80% accuracy. STS: 8.4.7.1., 8.4.7.2., 8.4.7.3.

SPECIALIZED TEAMS

The next element of the DRF we will cover are specialized teams. The teams that we are going to cover are the Readiness Support Team or RST, Contamination Control Team or CCT and the Shelter Management Team or SMT.

Figure 4-10

Readiness Support Team (RST)

The RST augments the CE Readiness Flight and the members work closely under the Readiness Flight supervision. Operations that the RST may be involved with, but are not limited to, include performing CBRNE monitoring and CBRNE control center tasks, operating a radiological contamination control station and responding to full spectrum threat incidents. MAJCOMs and DRUs specify the number of team members in their EM Plan 10-2.

Contamination Control Team (CCT)

Contamination control teams perform CBRNE contamination control procedures. They may be formed within any unit but, as a minimum, should be formed to control contamination for mission essential facilities, medical resources, aircraft, and equipment. The number of teams and team members must be based on the threat, mission, and magnitude of potential decontamination operations. As a minimum, maintenance, transportation, CE, and medical services have the capability to form teams.

- Conus: When a team is trained by its unit, it may be used for peacetime hazardous materials clean-up operations. Teams must be proficient in facing the wartime threat as well as any HAZMAT response needed. For HAZMAT response, a certified HAZMAT instructor must train team members. Teams may be assigned to specific functions, depending on MAJCOM guidance and installation commander determination. The Response Task Force (RTF) determines the type of contamination control teams needed for response to a nuclear weapons accident.

- Deployed: A contamination control team that is deployed may face additional threats based on their location and the immediate situation. Their training needs and equipment needs will increase. Trained teams may be asked to augment less experienced teams and provide expertise according to the mission requirements

Shelter Management Team (SMT)

Each commander who is responsible for a shelter must staff and train a SMT to provide 24-hour coverage in the shelter. To fully understand the basic concepts of shelter management operations and how to use equipment in the shelter, team members must be trained by readiness personnel.

The teams operate the shelter and selects sheltered personnel to perform internal tasks. Teams also control entry and exit into the shelter and internal shelter location of sheltered personnel. Other tasks the team must be able to perform include expedient

decontamination, monitoring for CBRNE contamination, chemical and radiological exposure control. They must also relay mission tasking's from unit supervisors.

- **Conus:** The minimum team size for emergency operations and rest and relief shelters used only during nuclear fallout is one shelter supervisor and one exposure control monitor per shift. For natural disaster support, minimum team size is one shelter supervisor and one assistant per shift. These team members provide the guidance and expertise needed to direct other people in the shelter so that all necessary functions are performed with the minimum amount of training needed.

- **Deployed:** Minimum team size for shelters equipped with collective protective systems, however, must include one shelter supervisor and one contamination control area monitor per shift

4. Installation Response Organization

d. Given applicable references, determine the necessary requirements to direct specialized teams with at least an 80% accuracy. STS: 8.4.7.6

SPECIALIZED TEAM REQUIREMENTS

Now that you are familiar with the basic requirements and principles of specialized teams, let's cover necessary requirements to direct those same specialized teams

General Information on Specialized Teams

As a rule the CBRNE Control Center is responsible for the supervision, management, and oversight of all CBRNE related operations. One of the duties of the Readiness Flight is directing the activation of specialized teams. It is important to understand when

this should occur so as not to hamper mission effectiveness or waste valuable manpower. Just as important as understanding when to activate the teams is realizing when to deactivate, or place them in a standby status. The teams you'll normally be responsible to activate are CBRNE Reconnaissance teams, Shelter Management Teams, and Contamination Control Teams. Establish procedures to activate these teams – consider: method of notification such as radios or conference calls, call signs, operating locations, communication checks, security, and "comm-out" procedures.

Figure 4-11

The Specialized Teams

Specialized teams are formed from base personnel resources to support emergency response operations. The Personnel Readiness Flight within the Mission Support Squadron will manage the base Resource Augmentation Duty program (READY program). All members assigned to the wing having no emergency response or mission essential tasks will be entered into this program. A READY Board (chaired by the wing commander) is held and all offices requiring addition manning during contingencies are assigned additional manning to use during emergencies. Normally, installations maintain a RST, CCT, and SMT.

Figure 4-12

Basic requirements for these teams include:

- Specialized team duty should be a team member's primary duty during emergency response operations, exercises, and training. Members should not be assigned conflicting emergency duties and you must appoint enough team members for 24-hour-a-day operations.
- Department of the Air Force civilian personnel may be assigned to specialized teams.
- Only the installation commander or designated representative should approve releasing a trained member for reasons other than permanent change of station, retirement, discharge, or medical disqualification. Remember, the replacement member must be trained before releasing the incumbent.

RST

The Readiness Support Team is usually activated in the pre-attack phase. During this phase they establish their monitoring route. They ensure all their equipment is available and operational. Their staging or dispersal area must also be prepared. Once these items are accomplished they may be placed in standby status, depending on the threat they may be used in another capacity. When in standby status, keep in contact in case of short notice recall.

SMT

Shelter Management teams are usually activated during the pre-attack phase. They prepare their shelters for operation by ensuring measures which were planned for are implemented, for example; shelter stocking, hardening, exposure control procedures, post-attack reporting, and CCA procedures.

Depending on the type of shelter, civil engineering may provide training on shelter systems such as power generation, filter change, owner-user maintenance, troubleshooting, etc.

Figure 4-13

CCT

Contamination Control Teams are also usually activated during the pre-attack phase. They ensure the equipment and supplies they need are on hand and serviceable. Their dispersal or staging area must also be prepared. They can then be placed in standby status until they're needed. Unlike the other two teams, CCTs often report to their Unit Control Center (UCC). Your plans should direct their activation through either the SRC or UCCs. CCT locations must be identified, and equipped away from priority targets, have alternate routes in and out of the sites, offer contamination avoidance and shrapnel protection

Specialized Team Operations

In order to help your base minimize the loss of operational capability you must ensure all CBRNE forces are ready. The control center, SRC, or CBRNECC is the place where you will monitor and direct all of your CBRNE forces. When intelligence information indicates the enemy has the ability and willingness to use chemical warfare agents, our ability to detect and identify these agents becomes critical. Under normal conditions the CBRNECC will direct monitoring team actions to include those of the CBRNE reconnaissance teams, shelter teams, contamination control teams, UCCs, damage assessment teams, and members from the base populace to perform monitoring actions. All these other sources help you to quickly obtain a much larger idea of the degree of contaminated areas on your base.

4. Installation Response Organization

e. Given applicable references, determine the necessary requirements to perform CBRN reconnaissance duties with at least an 80% accuracy. STS: 8.4.4

CBRNE RECONNISSANCE DUTIES

Determining CBRN Team Organization
The minimum size of a team is two people. One member maintains a constant watch for hazards, provides security, and calls for assistance if accidents or injuries occur. There is no maximum number of team members; however, team size should be kept to a minimum to reduce the number of people exposed to post attack hazards while still maintaining an ability to accomplish the mission. The use of large teams depends on the unit mission, weather, manning and need for additional security.

Establishing CBRNE Response Sectors
Peacetime preparedness at fixed-site locations in CONUS or OCONUS includes assessment of the site mission capabilities and response actions in a CBRNE environment. Based on the large geographical area that many fixed sites occupy, commanders may consider establishing CBRNE response sectors to aid CBRNE reconnaissance actions. The value of CBRNE sectors can become particularly useful upon receipt of post attack CBRNE reconnaissance reports. When attacks are imminent, commanders should make the same initial alarm and MOPP declarations for the entire installation. The use of sectors is very helpful in determining if Split MOPP is an option after an attack.

CBRNE Reconnaissance Team Equipment
Equipment allowances vary depending on unit authorizations and whether vehicles and communications equipment are designated for team use. Leaders adjust actual team equipment needs to match the threat, area of coverage, terrain, or mission. Reconnaissance team equipment may be dedicated and stored in team kits, or teams may use equipment from shelter management or other unit team kits.

The list of suggested equipment for a two-party survey team is shown.

Item	Quantity
Flashlight, high quality	2 each
Batteries, flashlight	Sufficient amount for 8 hours of use
Chemical light stick, white	10 each
Chemical light stick, red	10 each
NBC marking kit, signs	1 each
Survey tape, white	2 rolls
Communications device	1 each
M8 detector paper	5 booklets
M9 detector paper	2 rolls
Weapon	1 each (as required)
Hot-, cold-, wet-weather gear	2 sets
Magnifying glass	1 each
Radiac equipment, chemical detection device, DOD sampling kit	1 each
Handheld assay device	25 each

Figure 4-14

Preparing a CBRNE Reconnaissance Team

Units prepare to provide reconnaissance for their specific areas. Timely reporting allows the CBRNE center to assess the total status of mission resources and assign recovery forces where they are most effective. Specialized CBRNE reconnaissance teams may be directed to start operations immediately after the attack to provide commanders with a quick assessment of the status and the overall post attack situation. Commanders may also direct specialized teams to *auto roll* as soon as the attack is over.

Unit post attack reconnaissance (PAR) teams and individuals generally do not begin operations until directed by the CBRNE center. When preparing for post attack reconnaissance, teams will exercise caution to avoid crossing through cordoned and contaminated areas.

Team preparation includes planning for site security when selecting locations for CBRNE detectors and M8 detector paper. This reduces the possibility that pre-selected and routinely checked sites could be mined or that teams could be targeted for ambush during routine operations. As a general rule, do not locate detection sites outside established perimeters unless they are coordinated with, and approved by, security forces.

CBRN Reconnaissance Operations for Pre-Attack
During Pre-Attack Reconnaissance teams traveling over a predefined route may begin physically checking and reporting the status of each detector on the installation. Other representative actions may include:

- Inventorying CBRNE detection assets and integrating resources with the host base, Host Nation and joint forces.
- Continuing the assessment of manpower and support requirements.
- Identifying shortages and overages to higher headquarters.
- Developing mission tasks and work schedules for CBRNE personnel and augmented support personnel.
- Establishing and evaluating the CBRNE detection array.
- Activating the CBRNE detection, identification and warning system(s) when required.
- Establishing primary and secondary C2 capabilities in the survival recovery center (SRC) and the damage control center (DCC).
- Identifying and training personnel for CBRNE reconnaissance teams. (Define the AOR for each team, and ensure that communications and verification procedures are established.)
- Identifying and establishing CCAs for CBRNE-protected facilities.
- Identifying potential CCAs and TFAs if collective protection is inadequate or nonexistent.
- Ensuring that all CBRNE reconnaissance team personnel have been issued serviceable PPE and that reserve stocks are protected from loss, damage and possible contamination.
- Assisting unit personnel by checking their equipment for serviceability and ensuring that they inspect, maintain and clean their assigned equipment.
- Evaluating installation contamination avoidance activities.
- Evaluating installation passive defense activities (e.g., dispersal, cover, concealment, deception).

CBRN Reconnaissance Operations for Trans-Attack and Post-Attack
During Trans-Attack and Post-Attack an accurate assessment of the situation must be made. Based on the mission, enemy, terrain, weather, troops available and civilian considerations, the following actions should be taken to accurately and rapidly determine the degree of CBRNE contamination so that warnings can be provided or forces can be allowed to reduce protection:

- Implement contamination avoidance measures and take cover during attacks. Maintain situational awareness and report key observations as needed.

- Perform attack damage and hazard assessment.

- Survey the immediate area for casualties, UXO's, damage and indications of chemical use or fallout.

Figure 4-15

- Report findings and observations on weapon systems, munitions and tactics used in the attack to the CBRNE center.

- Monitor the area to verify the presence (or absence) and extent, of CBRNE agents.

- Be alert for indications of biological-agent use.

- Recommend a protective posture that applies to the threat or recommend further attack if contamination is absent. Conduct surveys to define and mark contaminated areas if contamination is present.

- Use the M291, M295, or another approved decontamination kit, as required, to decontaminate surfaces (vehicle access handles, equipment controls, bare metal, glass) before touching them.

- Plot contaminated areas, advise the CBRNE center on the agent persistency and provide CBRNE reports and warnings.

- Monitor for the arrival of fallout (e.g., plot nuclear detonations and fallout, predict downwind hazards). If fallout arrives at the installation, implement exposure and radiological contamination controls, predict radiation intensities and submit required reports.

- Evaluate craters to determine if a ground-bursting chemical weapon, conventional warhead, or airburst debris caused the crater.

- Identify vapor concentrations along designated routes.

- Collect, package and mark soil, water and vegetation samples that may be contaminated.

- Provide reconnaissance-related information to the CBRNE center. Report The:
    - Physical state of the agent (powder, liquid).
    - Apparent viscosity (neat sample or thickened agent).
    - Size of droplets.
    - Effect on vegetation, animals and personnel.

- Check the placement of detectors and the sector and area transition signs.

- Reposition vapor detectors between contaminated and uncontaminated areas or sectors as required, and replace the detectors if necessary.

- Search for residual hazards.

- Determine if designated open-air CCAs and TFAs are contaminated and locate uncontaminated CCAs and TFAs.

Ensure that personnel know their individual post-attack reconnaissance responsibilities. Critical mission-essential activities continue during post-attack reconnaissance and non-mission-essential personnel use available protection (i.e ,remain indoors) until hazards have been identified, located and reported.

5. Resource Planning, Programming and Budgeting System

a. Given applicable references, explain facts about the resource planning, programming and budgeting systems with at least an 80% accuracy. STS: 9.2.1, 9.2.2.2., 9.2.4., 9.2.5.

RESOURCE PLANNING, PROGRAMMING AND BUDGETING SYSTEM

What can you accomplish in your flight without resources? The answer is next to nothing! Managing your resources and your unit finances are important aspects of flight management and your NCO duties. Without the proper care and maintenance, your equipment will not last. Without adequate planning, programming and budgeting your needs won't be met and the mission could suffer. Proper funding is an integral part of the readiness flights mission accomplishment!

In this section we will cover the principles of Planning, Programming and Budgeting, Civil Engineering Allowance Standards and the preparation and justification of those budget inputs.

PRINCIPLES

When dealing with critical resources and funds it is critical to understand the process before undertaking anything dealing with finances. Financial management is the detailed process of determining your units resources, and effectively applying those critical and sometimes limited resources to meet the Air Force's direct mission and support responsibilities it may have.

funds are easier to procure when proper planning, programming and budgeting has been accomplished well in advance to the need arising. As the defense budget becomes tighter the need for short and long range resource control becomes decidedly more critical when controlling the finances of a Readiness flights many missions

The Economic Security within the Civil Engineer community is based on three factors:

- Preservation and enhancement of existing assets
- Planning for your future asset investments by systematically considering economic benefits and costs when chosen among alternative approaches and methods
- Assets of potential impact on the local community as a result of proposed Air Force actions

The Readiness Flight has the responsibility to have proper financial discipline because many Emergency Management related programs are resource dependent and essential for mission accomplishment

To understand the resource planning, programming and budgeting for Emergency Management programs, we must first understand the resource management system or RMS

Resources Management System (RMS)
The Resource Management System is a detailed and intricate management tool used for controlling, monitoring, advising and budgeting the selected resources and potential funds needed or available for mission completion or long and short- term continuation.

The Resource Management System is made possible because of the members who are responsible for the performance and mission assignments within their functional areas to include the resources required to perform the mission.

Responsibility Center Manager “RCM”, Resource Advisor “RA”, and Cost Centers “CC make up the Resource Management System in Civil Engineering.

Responsibility Center Manager (RCM)
The Responsibility Center Manager has the following guidelines:

- Squadron commander is appointed as the unit’s Responsibility Center Manager
- Maintains overall responsibility for the financial management of the squadron
- Responsible for the effective, efficient, and economical use of all resources
- Continually reviews the status of squadron funding
- Overseas the Prioritization and justification of requirements
- Monitors the preparation of the annual financial plan
- Initially distributes and redistributes funds to subordinate cost center manager
- Appoints an RA

Resource Advisor (RA)
The Resource Advisor has the following guidelines:

- Normally assigned to the resources flight in Civil Engineering
- Responsible for preparing the squadron’s operating budget and financial plan
- Administers the approved operating budget
- Focal point for the unit’s funding issues
- Primary point of contact with finance personnel and each flight’s Cost center manager or CM
- Must have a working knowledge of the whole organization
- Understands financial services and base supply systems and their financial management reports

- Ensures that spending policy is consistent with mission requirements
- Monitors and assists unit's CCM

Cost Center Manager (CCM)
The Cost Center Managers has the following guidelines:

- The cost center is a flight or section within a squadron. The Readiness flight, as a whole, is usually considered a cost center with the Readiness Flight chief appointed CCM
- The CCM is a Middle-level manager who is familiar with the entire operational functions under their financial control
- Coordinates with RA on all budget matters for the cost centers
- Regulates their function's day-to-day consumption of supplies, equipment, and services
- Makes budget forecasts for their particular flight
- Provides budget input to the RA for developing the unit's operating budget
- After the budget requirements are formulated, they become the unit's financial plan for the next year's operating budget

ALLOWANCE STANDARDS

Allowance Standards or "AS prescribe items and quantities of equipment required to perform assigned peacetime and wartime missions, functions, and duties of Air Force organizations and individual specialists which will impact the entire spectrum of mission accomplishment

Air Force Equipment Management System (AFEMS)
In terms of Allowance Standards, the Air Force Equipment Management System (AFEMS) will:

- Allow users on-line query capabilities to determine maximum quantities allowed for items for a given organization's mission

- Validate all base authorizations to ensure they do not exceed maximum allowances
- Request AS hard copy reports using on-line query allowance standard inquiry
- Provide allowance changes to all affected users through e-mail notices if access is available
- Identify in-use substitutes with questionable suitability for the preferred item
- Provide hard copy or microfiche AS to non-AFEMS users on a quarterly basis

Allowable Quantities
Normally, the basis of issue in an allowance standard presents the maximum allowable quantity of items authorized with but the organization commander may exceed the basis of issue on non-weapon system allowance standards when the item is base-funded equipment and is for base support requirement

But just because an equipment item is authorized in an allowance standards, does not mean that the flight should have the item on hand. You must check the need for the item and readdress the need for such an item

Also if a required item is not available determine if there is a substitute item that can be used instead of the exact item listed in the allowance standards

Expendable and Non-Expendable Items
Generally speaking, only non-expendable items are listed in the appropriate allowance standard. Exempt from this policy are specialized tools, personal retention and survival items, components of bench sets, and War Reserve Material know as “WRM”

Under the old system of Table of Allowances, The previous table of allowances included cameras, compasses, megaphones, refrigerators, stopwatches, binoculars, etc

The current allowance standards system no longer list these items because they are either expendable or they are local purchase

But you must remember that just because an item is considered local purchase doesn’t mean that it isn’t accountable. These items will have to be accounted for in some way, like serial number listing or computer database tracking

To find an index of allowance standards look in AFIND 10 or on-line with AFEMS

Requests for changes to allowance standards can be made by any activity

Authorization
Allowance Standards are the sole basis for authorization and procurement of equipment items for mobility requirements such as Civil Engineer Prime BEEF
When dealing with base supply remember they cannot order equipment unless the item is contained in a valid allowance standard

Pilot unit are not supposed to add an equipment item to the LOGDET of a Unit Type Codes unless the item is listed in an allowance standard

Allowance Standards

- Allowance Standards used by the Readiness Flight

- AS 006: Organizational and Administrative Equipment
- AS 009: Small Computer Systems
- AS 016: Special Purpose Clothing and Personal Equipment
- AS 019: All MAJCOM Vehicle Support
- AS 156: Air Base Operability
- AS 158: Harvest Falcon Bare Base Support Program
- AS 159: Harvest Eagle Support System
- AS 429: Prime BEEF (to include training sets)
- AS 456: EOD
- AS 459: NBC Equipment
- AS 464: Operations Flight Support Equipment
- AS 538: Small Arms
- AS 629: Visual Information Support
- AS 658: Fixed Ground Communications Security Equipment
- AS 660: Communications

There is lot of information contained on an Allowance standard. When dealing with them you will need a portion of the information. Some of the more important information the will be useful is listed:

1. Stock number
2. Nomenclature
3. Part number
4. Allowed quantity
5. Use code
6. Allowance identifier

PERPARING INPUTS

Preparation

When preparing your inputs you must start by choosing the appropriate allowance standards and proper allowance identifier. Because allowance standards provide allowances for many different types of units and UTC each type of unit and UTC has its own allowance identifier. Have them available when preparing your inputs.

For example, take Allowance standard 429. Both lead and follow UTC authorizations are included in the allowance standards. Because both teams do not have the same type or amount of equipment the allowance standard uses the allowance identifiers to keep the two teams allowances separate. The lead team's allowance identifier is 429LOOA and the follow team's allowance identifier is 429LOOB. There are other identifiers for the other UTCs and types of units included in the allowance standards 429.

The first three numbers in the allowance identifier is called the allowance source code or "ASC". It is the three numeric characters of the allowance standards. The last four

letters are called the allowance identifier suffix. The suffix identifies the UTC or type of unit

When your using the appropriate allowance identifier, look up the National Stock Number or NSN for the item in question to get a detailed description of the item.

The authorization will be found on the right side of the allowance standards. Understand that this is true for the hard copies received from the CD-ROM version. In reality information can be displayed and printed in different ways.

If needed or required, the equipment custodian can submit change requests when allowances are inadequate or excessive, or when the equipment is unsuitable fir the required function

Physical Preparation

When physically preparing inputs, fill out and submit an Air Force Form 601, through the organization commander to the Supply Equipment Management Section or “EMS”. This can also be done on-line with AFEMS if needed.

The Equipment Management Section inputs the AF Form 601, on-line with AFEMS along with their comments. If the form is all ready on-line, AFEMS will notify the Equipment Management Section so they can add their comments if necessary.

The AFEMS system will notify the next evaluator in the chain. Depending on the item it could be a MAJCOM or even possibly the allowance manager.

All changes to Unit Type Codes will have to be coordinated with the pilot unit before any allowance changes can be made.

When inquiring, allowance change request status can be obtained on-line at AFEMS.

The AFEMS system will also provide an e-mail notice which notifies the initiator and all of the evaluators of the final disposition of the change request

JUSTIFICATION

With the ever increasing criticality relating to budget requirements, all new or increases to existing equipment stocks will need to have strong justification to expend limited funds. These justifications will have to be tied directly to mission accomplishment whether it is for peacetime sustainment or a wartime contingency operation plan.

When developing, include a solid package for each submission that must include:

- The basic item information (name, price, source etc)
- Intention or use for this item
- The effectiveness of “non-material” work around’s you may have determined necessary.
- The critical impact statement outlining results if item is not obtained or locally procured.

Special Note: Remember to include how the item will affect the mission to include its relation to SORTS because this may raise the level of your justification or impact statement.

6. Planning

a. Given applicable references, describe the principles of hazard analysis with at least an 80% accuracy. STS: 9.4.1.4.1.1., 9.4.1.4.1.2., 9.4.1.4.1.3., 9.4.1.4.1.4.

HAZARD ANALYSIS

The three key steps associated with hazards analysis are: 1- Hazard Identification, 2- Vulnerability Analysis, and 3- Risk Assessment. As you see here Vulnerability assessments are listed as well. We will learn in this objective that this is a separate type of assessment

Hazard Identification

The first step in a hazard analysis is Hazard Identification. During this step gather all available threat information. Ensure this "threat baseline" is agreed upon by all relevant activities. This will prevent follow-on disconnects between Readiness, Security Forces, OSI preparations, etc., and ensure unit commanders have a clear idea of the probable attack situation. Include potential major accident and natural disaster events in this "hazard identification".

Vulnerability Analysis

The second step of a hazard analysis is Vulnerability analysis where we determine the unit's ability to survive and continue effective mission operations in the event the previously identified hazards and attack situation(s) occur. Analyze each individual aspect of the threat in great detail.

Risk Assessment

The third step is Risk Assessment. Here we determine the probability of the threat(s) and unit vulnerability. This is the process of determining the likelihood of a disaster for your installation and the severity of the consequences stemming from that disaster.

Vulnerability Assessment of Installations

Vulnerability assessments or VAs shall focus on the assessed installation overarching Anti Terrorism program. Anti Terrorism programs should be subject to continual assessment to avoid complacency and gain benefit from experience from other assessments.

There are two types of Vulnerability Assessments: the local VA and the higher headquarters VA. Local VAs will be conducted at least annually, except for those years when a higher headquarters VA is conducted.

6. Planning

b. Given applicable references, analyze the steps required to conduct a hazard analysis with at least an 80% accuracy. STS: 9.4.1.4.2.1., 9.4.1.4.2.2., 9.4.1.4.2.3., 9.4.1.4.2.4.

HAZARD ANALYSIS

A Hazard Analysis is the cornerstone of mitigation; it establishes a common point of departure and the bounds within which effective plans and alternatives can be formulated, published, and executed. Achieving accurate hazard analysis provides the basis for public awareness and preparedness.

Hazard Identification

This hazard analysis is a three step decision-making process of collecting and analyzing information on potential threats. It is used to obtain a clear understanding of what hazards exist and the risk posed to people, property, missions, and the environment. The information developed in a hazard analysis provides the basis for notification and reporting requirements, establishes subsequent planning priorities, and provides the documentation to support planning and response efforts. Many aspects of the site survey directly relate to the vulnerability assessment. Keep this in mind as you complete the basic steps associated with the hazard analysis process.

HAZARD IDENTIFICATION	VULNERABILITY ANALYSIS	RISK ASSESSMENT
• HAZMAT Release • Natural Disaster • Man-made Disaster • Location • Quantity	• Vulnerable Zone • Human Populations • Critical Facilities • Environment	• Likelihood of Disaster • Severity of the Consequences

AFH 32-4016, Vol.1, Table 4.1.

Figure 6-1

First Step of the process is Hazard Identification. Here you will pose the question What is the threat? The primary component in hazard analysis is to identify potential threats to the installation, its personnel, and its mission. This may be from the types of hazardous materials used or stored on the installation, type of weapons system assigned, the prevalent natural disaster threats, or even the geographic location and political environment.

Vulnerability Analysis

The Second Step of a hazard analysis is the Vulnerability Analysis. This is when you will answer Who or what is at risk? You will assess areas potentially affected by the threat. This includes gathering information on the extent of the vulnerable zone (the impacted area), conditions that influence the zone, size and type of population within the zone, property that might be damaged, and the environment that might be affected. Readiness personnel must not attempt to accomplish the entire vulnerability analysis themselves. The functional OPR for each aspect of the threat (Security Forces for the

ground threat for example) should take the lead in analyzing their area(s) of responsibility. Units will not be vulnerable to all threats or have the same degree of vulnerability to each hazard. For example, a unit might be totally prepared to operate in a tear gas environment, moderately prepared to operate in a non-persistent chemical environment, and basically unprepared to operate in a persistent chemical or biologically contaminated environment.

Risk Assessment

The third and final step is Risk Assessment. Armed with the information you and your functional OPRs now hold ask yourselves this…How real is the risk? Here we will assess the likelihood of an occurrence (such as an accidental release of a hazardous material) and the consequences that might result based on the estimated vulnerable zones. In other words, what are the chances of it really happening? A Risk assessment is based on the history of previous incidents at the installation, mathematical modeling, and the best available information. For example, developing hurricane evacuation centers is based on the history of hurricane patterns as opposed to only considering where the previous one hit. Risk analysis is key to the planning process. Your base will decide how to use its limited resources depending on risk analysis.

Questions To Help the Process

To begin your analysis and assess your threats, vulnerabilities, and risks, start by asking yourself the following questions:

1. What are the missions supported by the base/wing/unit?
2. Are there home station or deployed missions? Consider both primary and secondary missions and tasking's.
3. What are the installation's strengths, capabilities, and shortfalls? Make separate lists and carefully note the limitations and shortfalls.
4. What supporting forces or outside agencies are available and what resources do they have? Are support agreements in place that outline responsibilities between agencies?
5. What are the most probable incidents and their worst possible impact?
6. What is the wing's priorities for protecting its resources?
7. What resources are protected, where are they, and who controls them?
8. What resources require additional levels of protection? Consider personnel, critical facilities (communications /transportation nodes), and asset vulnerabilities (munitions, fuels, etc.).

(**Note**: Answers to these questions could make this section classified)

Vulnerability Assessment

Although the Vulnerability assessments is not a step in the hazard identification process it holds its own steps for conducting an assessment of the Anti-Terrorism realm.

Due to evolving terrorism threats, changes in security technology, development and implementation of alternative concepts of peacetime operations and changing local conditions make periodic assessment essential. These assessments should consider the range of identified and projected terrorism threats against a specific location or installation, personnel, family members, facilities and other assets. The assessment should identify vulnerabilities and solutions for enhanced protection of DoD personnel and resources.

Anti-Terrorism Assessment Functional Areas. Anti-Terrorism VAs provide a vulnerability-based analysis of an activity's Anti-Terrorism program. The assessment identifies, for the commander, vulnerabilities that may be exploited by terrorists and suggests options that may eliminate or mitigate those vulnerabilities. The assessment team shall evaluate the installations overall Anti-Terrorism Awareness posture IAW Table 1.1 of AFI 10-245 and DoDI 2000.16, Standard 22, table 1.1. All VAs will be classified in accordance with the DTRA Security Classification Guide.

6. Planning

c. Given applicable references, analyze the steps required to develop installation plans with at least an 80% accuracy. STS: 9.4.3.1., 9.4.3.5., 9.4.3.6.

PLANNING

Before we cover the steps to develop plans lets talk priorities of the planning process. First the highest priorities are force survivability and mission continuation. Review the Planning information in AFI 10-2501 to refresh your basic planning knowledge.

EM Plan 10-2

The following documents cover the Full Spectrum of Threats for installation response to incidents and should be referenced when developing EM Plan 10-2.

- Survival, recovery and reconstitution plans.
- Continuity of OPLANs. See AFMAN 10-2602.
- JSP/BSPs. Considerations for operations:
    - Intelligence collection, analysis and production
    - Situational awareness
    - Common planning, training and equipment standards
    - Medical CBRNE defense
    - Protection of the joint rear area and theater sustainment capabilities

    - Logistic burden of CBRNE attacks
    - In-theater active defense systems
    - Effects of CBRNE attacks on command, control, communications and computers
    - Capabilities and limitations of multinational forces
    - In-theater consequence management
- Installation-level plans, such as the Base Civil Engineer (BCE) Contingency Response Plan (CRP).
- Host-tenant, inter-service and wartime host support agreements.

Air Force installations will create a EM Plan 10-2. During deployments, commanders may need to use other planning documents such as an In-Garrison Expeditionary Site Plan (IGESP) to provide EM guidance until a em Plan 10-2 can be developed for the deployment location. Sufficient resources may not be available in the early stages of a deployment to implement a comprehensive EM program.

You will need to review Attachment 3 in AFI 10-2501 for guidance on writing the EM Plan 10-2.

Plan provides comprehensive guidance for response to major accidents, natural disasters, wartime CBRNE attacks, and peacetime terrorist use of WMD. MAJCOMs may provide specific EM requirements for their installations and commanders. Program management, exercise and administrative information must be included in a installation instruction or a supplement to this instruction.

GSUs are not required to develop a EM Plan 10-2. However, they must develop EM operating procedures and coordinate them with their host installation CE Readiness Flight. Specific support requirements for off-base units must be clearly identified in the EM Plan 10-2.

The plan will list key actions that the commander or units are to accomplish based on conditions or events that may affect the installation. Do not repeat information provided in the main body of the plan in the annexes.

There are five annexes to the EM Plan 10-2.

1. Annex A: Major Accidents
2. Annex B: Natural Disasters
3. Annex C: Attack Actions * (When complete EM guidance for enemy attack is included in another plan (IGESP, WMP-1, etc…), Annex C is not required.
4. Annex D: Terrorist Use of WMD
5. Annex Z: Distribution

In Garrison Expeditionary Site Plan

The In-Garrison Expeditionary Site Plan (IGESP) is primarily developed for locations with a permanent Air Force presence, and are fully developed by the collaborative planning efforts of many functional experts with a deliberate planning time line. All plans formerly called Base Support Plans (BSPs) will be re-designated IGESPs. The term IGESP describes all plans developed to meet deliberate planning requirements, contingency planning requirements, and any other site planning requirements. While the term BSP is superseded; the requirement for robust, structured, and standardized site planning based on AFI 10-404 remains.

A planning body appointed by the installation commander to facilitate the development and is normally comprised of senior level leadership.

Inputs to BSPs/ISPs

Upon receipt of draft, new or updated IGESP/JSPs, Readiness Flights should accomplish a plan review and provide recommended changes and comments back to the IGESP/JSP OPR. Direct correspondence between deploying and reception units is encouraged.

7. Mobility

a. Given applicable references, explain facts about the Manpower and Equipment Force Packing System (MEFPAK) with at least an 80% accuracy. STS: 9.5.5.1.

MOBILITY

Since the early days of aviation, the USAF has developed and sustained airbases for the projection of air and space power. Development and sustainement have been achieved through our ability to mobilize and deploy these forces with a minimal amount of effort. In the Civil Engineers Squadron and especially in Readiness, we accomplish this through the Prime BEEF (Base Engineer Emergency Force) or PB program management under the guise of mobility. In this section we will cover how we posture, develop and track these teams to accomplish this critical mission

MEEPAK

The Manpower and Equipment Force Packing System or MEFPAK is the detailed process for developing and describing standard, predefined manpower and equipment force packages and determining the deployment characteristics of these packages in

support of the Joint Planning and Execution System or JOPES and the Contingency Operation/ Mobility Planning and Execution System or COMPES. MEFPAK was established to provide standard descriptions of units and elements to be used for wartime, contingency, and force planning to all levels of command and structure.

There are two major components the Readiness Flight uses in the Manpower, Equipment and Force Packaging system:

- Manpower Force Module (MANFOR)

- Logistics Force Packaging Subsystem (LOGFOR)

MANFOR
The MANFOR system contains Air Force specialty codes level detail for each Unit Type Code containing personnel. The detailed MANFOR data includes:

1. The title record
2. Mission Capability Statement or MISCAP
3. Manpower Detail.

LOGFOR
The LOGFOR subsystem contains the basic or standard logistics details known as the "LOGDET" and movement characteristics for Unit Type Codes or UTC. These files contain the baseline information that each unit must use to posture the equipment and supplies for their UTCs. At base level, these are listed as read only files.

The two subsystems of LOGFOR are:

1. Logistics Planning Module (LOGPLAN)
2. Logistics Module (LOGMOD)

- **LOGPLAN**
  Under LOGFOR, the LOGPLAN subsystem is specifically designed so you can manage and store the "Logistics Detail" or LOGDET for your individual unit. The LOGPLAN gives you the capability to enter unit specific data about your equipment and supplies and the detailed ability to adjust the file information when you add, delete, or replace items. However, you still must remember to follow the LOGDET. When adding something new, remember to follow local procedures for changing the LOGDET.

- **LOGFOR**
  Also underneath LOGFOR, The Logistics Module automates the development and distribution of deployable force packages. LOGMOD is

nothing more than a computer system Unit Deployment Managers or UDMs use to manage UTCs. Within the LOGMOD computer system, Readiness will primarily use the Unit Deployment Manager Module. This is a special sub-system within LOGMOD that UDMs have access to in order to change/update information if required.

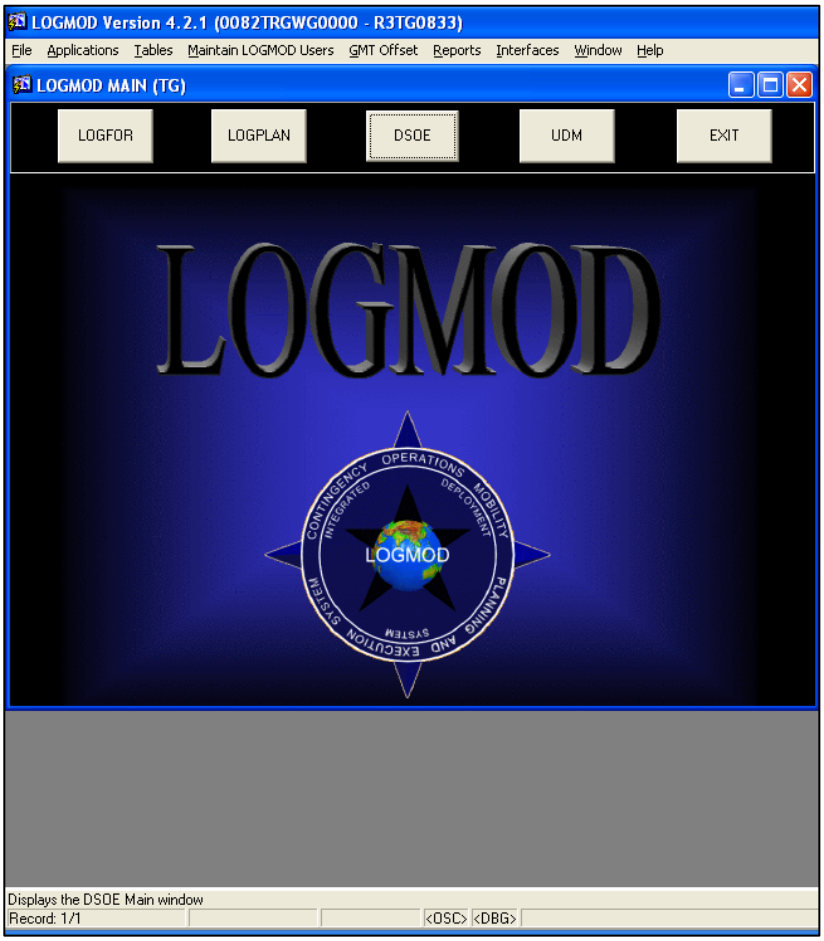


Figure 7-1

MEFPAK Specific

Detailed Mission equipment and force packaging data is distributed service-wide, using a pre-coordinated UTC reduces the amount of detailed planning and coordination needed during Operation Plan and or Emergency Management plan development, review, and execution.

The Mission equipment and force packaging or MEFPAK allows UTCs to be added, reviewed, changed, and deleted from the system. This information is then used in the JOPES and COMPES systems when needed

When talking MEFPAK, each UTC has a MAJCOM that has been designated by HQ United States Air Force as the MEFPAK Responsible Command.

That responsible MAJCOM will develop, review, update, and when necessary delete UTCs as appropriate. The reviewing of a UTC is an annual requirement.

PILOT UNIT

UTC Pilot units are designated by the MEFPAK Responsible Command and are responsible for developing and maintaining the manpower and logistics detail for each standard UTC it has assigned against it. This is to attain a goal of a uniform package for all units that will use the UTC.

When units submit and coordinate UTC change they must first go through their parent MAJCOM.

The pilot unit coordinates recommended changes to the LOGDET and manpower detail with non-pilot units. If a non-pilot has recommendations for UTC changes, it makes them to the pilot unit when necessary.

All pilot units will also coordinate proposed changes with the non-pilot units to obtain a consensus for changes before making the change permanently.

7. Mobility

b. Given applicable references, explain facts about Unit Type Codes (UTCs) with at least an 80% accuracy. STS: 9.5.5.2.1., 9.5.5.2.2.

UNIT TYPE CODES (UTC)

When defining Unit Type Codes you must understand that they are the building blocks for determining manpower and logistic support requirements. The basic definition is that a UTC is a 5 character, alphanumeric code controlled by the Joint Chiefs of Staff that will identify units that have both common and distinguishing characteristics. The first two characters of the UTC will define the function it represents. A UTC is also the baseline for unit deployments and all unit readiness reporting.

Further definition of these characters can be found in Joint Pub 1-03.21

Standard Vs Non-Standard

To understand UTCs, you must first realize that there are two types; Standard and Non-standard.

Standard
Standard UTCs can be deployable and non-deployable. A Deployable UTC is one in which the MFE and/or equipment can be deployed to another location. A Non-deployable UTC is one that is inherently not deployable, i.e. moveable to another location, and has a deployment Indicator of 9. Standard UTC is a UTC in the MEFPAK and Type Unit Characteristics data file. These UTCs have a complete movement characteristic in both files. Such a UTC would be of a fixed composition. The next slide covers standard UTCs for Civil Engineers from an extract from AFI 10-210 Table 2.1

Civil Engineer UTC's

Table 2.1. Building Block UTCs.

UTC SERIES	UTC
Beddown	4F9EA/EW; 4F9EP/EZ; 4F9EB/EY; 4F9AP
Fire Fighter	4F9FJ; 4F9FP; 4F9FN; 4F9FA
NBC Defense	4F9DA; 4F9DB; 4F9DC
EOD	4F9X1; 4F9X2; 4F9X3; 4F9X9; 4F9XA
NOTE: For additional information pertaining to the description and composition of each UTC, please refer to the AFCESA website listed here: **https//wwwmil.afcesa.af.mil/Directorate/cex/cexx/utcs/default.html**	

Figure 7-2

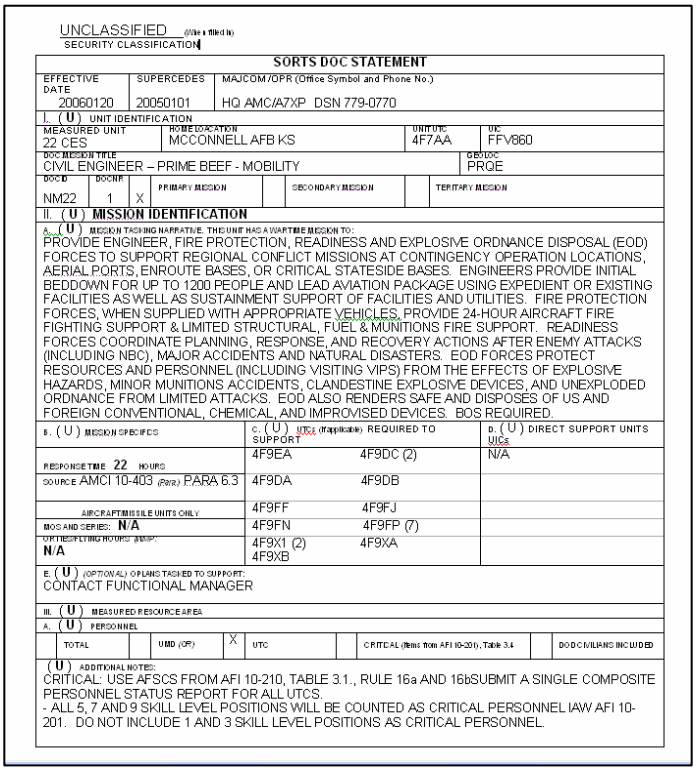
Non-Standard
A non-standard UTC is a UTC in the MEFPAK and Type Unit Characteristics file that does not have the complete movement characteristics. The two types of non-standard UTCs are "Z99" and "Associated" UTCs. Examples are 3FZ99 and QFZZZ.

7. Mobility

c. Given applicable references, describe the utilization of Designed Operational Capability (DOC) Statements with at least an 80% accuracy. STS: 9.5.5.3.

DOC STATEMENT UTILIZATION

Within the Civil Engineers Squadron mobility process, the most important item the Readiness Flight will have is called the "Designed Operational Capability Statement" or "DOC" statement.



UNCLASSIFIED (When filled in)
SECURITY CLASSIFICATION

SORTS DOC STATEMENT

EFFECTIVE DATE	SUPERCEDES	MAJCOM/OPR (Office Symbol and Phone No.)
20060120	20050101	HQ AMC/A7XP DSN 779-0770

I. (U) UNIT IDENTIFICATION

MEASURED UNIT	HOME LOCATION	UNIT UTC	UIC
22 CES	MCCONNELL AFB KS	4F7AA	FFV860

DOC MISSION TITLE	GEO LOC
CIVIL ENGINEER – PRIME BEEF - MOBILITY	PRQE

DOC ID	DOC NR		PRIMARY MISSION		SECONDARY MISSION		TERTIARY MISSION
NM22	1	X					

II. (U) **MISSION IDENTIFICATION**

A. (U) MISSION TASKING NARRATIVE. THE UNIT HAS A WARTIME MISSION TO:
PROVIDE ENGINEER, FIRE PROTECTION, READINESS AND EXPLOSIVE ORDNANCE DISPOSAL (EOD) FORCES TO SUPPORT REGIONAL CONFLICT MISSIONS AT CONTINGENCY OPERATION LOCATIONS, AERIAL PORTS, ENROUTE BASES, OR CRITICAL STATESIDE BASES. ENGINEERS PROVIDE INITIAL BEDDOWN FOR UP TO 1200 PEOPLE AND LEAD AVIATION PACKAGE USING EXPEDIENT OR EXISTING FACILITIES AS WELL AS SUSTAINMENT SUPPORT OF FACILITIES AND UTILITIES. FIRE PROTECTION FORCES, WHEN SUPPLIED WITH APPROPRIATE VEHICLES, PROVIDE 24-HOUR AIRCRAFT FIRE FIGHTING SUPPORT & LIMITED STRUCTURAL, FUEL & MUNITIONS FIRE SUPPORT. READINESS FORCES COORDINATE PLANNING, RESPONSE, AND RECOVERY ACTIONS AFTER ENEMY ATTACKS (INCLUDING NBC), MAJOR ACCIDENTS AND NATURAL DISASTERS. EOD FORCES PROTECT RESOURCES AND PERSONNEL (INCLUDING VISITING VIPS) FROM THE EFFECTS OF EXPLOSIVE HAZARDS, MINOR MUNITIONS ACCIDENTS, CLANDESTINE EXPLOSIVE DEVICES, AND UNEXPLODED ORDNANCE FROM LIMITED ATTACKS. EOD ALSO RENDERS SAFE AND DISPOSES OF US AND FOREIGN CONVENTIONAL, CHEMICAL, AND IMPROVISED DEVICES. BOS REQUIRED.

B. (U) MISSION SPECIFICS	C. (U) UTCs (If applicable) REQUIRED TO SUPPORT		D. (U) DIRECT SUPPORT UNITS UICs
RESPONSE TIME 22 HOURS	4F9EA	4F9DC (2)	N/A
SOURCE AMCI 10-403 (Para) PARA 6.3	4F9DA	4F9DB	
AIRCRAFT/MISSILE UNITS ONLY	4F9FF	4F9FJ	
MDS AND SERIES: N/A	4F9FN	4F9FP (7)	
OPTIMUM FLYING HOURS (MMSP): N/A	4F9X1 (2) 4F9XB	4F9XA	

E. (U) (OPTIONAL) OPLANS TASKED TO SUPPORT:
CONTACT FUNCTIONAL MANAGER

III. (U) MEASURED RESOURCE AREA

A. (U) PERSONNEL

TOTAL		UMD (OF)	X	UTC		CRITICAL (Items from AFI 10-201), Table 3.4		DOD CIVILIANS INCLUDED

(U) ADDITIONAL NOTES:
CRITICAL: USE AFSCS FROM AFI 10-210, TABLE 3.1., RULE 16a AND 16bSUBMIT A SINGLE COMPOSITE PERSONNEL STATUS REPORT FOR ALL UTCS.
- ALL 5, 7 AND 9 SKILL LEVEL POSITIONS WILL BE COUNTED AS CRITICAL PERSONNEL IAW AFI 10-201. DO NOT INCLUDE 1 AND 3 SKILL LEVEL POSITIONS AS CRITICAL PERSONNEL.

Figure 7-3

This document identifies what Unit Type Codes (UTCs) your unit is responsible to support. The example on the left shows a Civil Engineers "DOC" statement.

General Information on DOC Statements

The parent MAJCOM staff will be preparing DOC Statements for the individual units it supports. HQ Air Force Reserve Command and the National Guard Bureau must

coordinate proposed DOC statements with the initial gaining commands for their respective units. Recipients at all levels will review their new DOC statements and forward any comments to the parent command reporting organization. New commanders of measured units will review unit statements as soon as possible after assuming command.

Purpose of DOC Statements

As a DOC statement lists all CE mobility tasking's, the OPlans are the source of those taskings. A DOC statement is the document that your Status of Resources and Training System or "SORTS" reports are based on. The SORTS DOC statements provide units with their specific SORTS measurement standards or criteria for unit C-level reporting. The DOC statement also tells you what teams and equipment you must posture to support the mission. They also provide basic data that must be included in the SORTS report for unit-specific SORTS measurement guidance. It also provides any special reporting instructions for the SORTS report.

Measuring DOC's

When dealing with DOC statements and SORTS, The Chairman, Joint Chiefs of Staff (CJCS) SORTS policy requires the unit overall C-level to be based on the unit resources and training required to perform the unit's full wartime missions.
Although directive in nature, a DOC statement is not a tasking instruments.
DOC statements and OPlans are only capability documents. They reflect the capability the units are expected to have at execution, barring any unforeseen changes or modifications. When dealing with DOC statements you must understanding that there are Single and Multiple DOC Statements. Most units will have only a single DOC statement called the primary DOC.

If parts of a unit's total wartime mission are significantly different, the parent MAJCOM, if necessary, may elect to produce multiple DOC statements for that unit. When talking funding, the most resource intensive portion of the total mission will normally be called the primary DOC. With the next most resource intensive one will be called the secondary DOC. The third will be the tertiary DOC

Note: Units should not use the SORTS rank ordering to prioritize training or resource allocation requirements, unless directed by the MAJCOM

Major Components of DOC statements

- DOC statement effective date entry
- Part I, Unit Identification
- Part II, Mission Identification
- UTCs Tasked to Support

- Direct Support Unit UICs: This is the aircraft unit or units you will be supporting
- OPlans Tasked to Support
- Part III, Measured Resource Areas
- Part IV, Amplifying Notes
- Part V, Gaining Commands
- Part VI, Coordination / Review

DOC Statement Effective Date Entry

- This is when the DOC statement is effective as determined by the parent MAJCOM
- This line includes the effective date, the date of the superseded DOC statement, and the MAJCOM or OPR for the DOC statement
- The parent MAJCOM may release a DOC statement to you with an effective date in the future; thereby allowing you to build towards meeting your wartime mission capability

Part I, Identification

- Measured Unit: This is your unit designation
- Home Location: Unit home geographic name and country or state code from the geographic file (GEOFILE)
- Unit UTC: This is your in-place UTC for your type of unit. It is not the same as part II C
- Unit Identification Code (UIC): A six-digit alphanumeric code for your particular unit. It is the code for the measured unit
- DOC Mission Title: This will contain a description of your primary tasking(s). Use titles from AFI 10-201, Table 2.1 that best describes the unit mission. For example, Prime BEEF – Mobility
- Home Location Code (GEO LOC): This is the code for your home location
- DOC Identifier (DODIC): This is the code for the DOC mission title taken from AFI 10-201, Table 2.1
- Mission Rank: Primary, secondary, or tertiary

Part II, Mission Identification

- Mission Tasking Narrative: This describes wartime mission capability on which unit will base C-level data
- Mission Specifics:
    - Response Time: Shortest time in hours (01-72) in which the unit must be able to respond for deployment from time of notification. This is when we must be ready-to-load.
    - Source: List the source for the response time criteria.

- The other entries are for aircraft units.

Direct Support Unit UICs

This is the aircraft unit or units you will be supporting

O-Plans Tasked to Support

- This lists plans and other documents requiring the unit to have the described capability.
- If this information causes the DOC statement to be classified, MAJCOMs may delete it from copies sent to units to ease storage.
- For ANG, the National Guard Bureau will select which DOC statements must have this entry

Part III, Measured Resource Areas

Personnel Measured Resource Area

The source document for personnel will be indicated as well as if emergency essential civilians should be included. There is also an area for additional notes

Training Measured Resource Area

The method you will use to calculate training will be marked as well as the source document that states the training standards.

The two methods are:

- Method B – crews mission ready
- Method C – unit training completed
- There is also an area for additional notes

Equipment and Supplies On Hand Measured Resource Area

The two sub areas under this measured resource area are combat essential equipment and support equipment:

- Combat essential equipment includes the primary weapon systems or service-designated items of equipment assigned to a unit to undertake its specified wartime mission.
- Support equipment is equipment required to perform the support function except that which is an integral part of the mission equipment.
- There is also an area for additional notes

Equipment Condition Measured Resource Area

The two sub areas under this measured resource area are combat essential equipment and support equipment. There is also an area for additional notes

Part IV, V, and VI

- Part IV, Amplifying Notes
- Part V, Gaining Commands
- Part VI, Coordination / Review

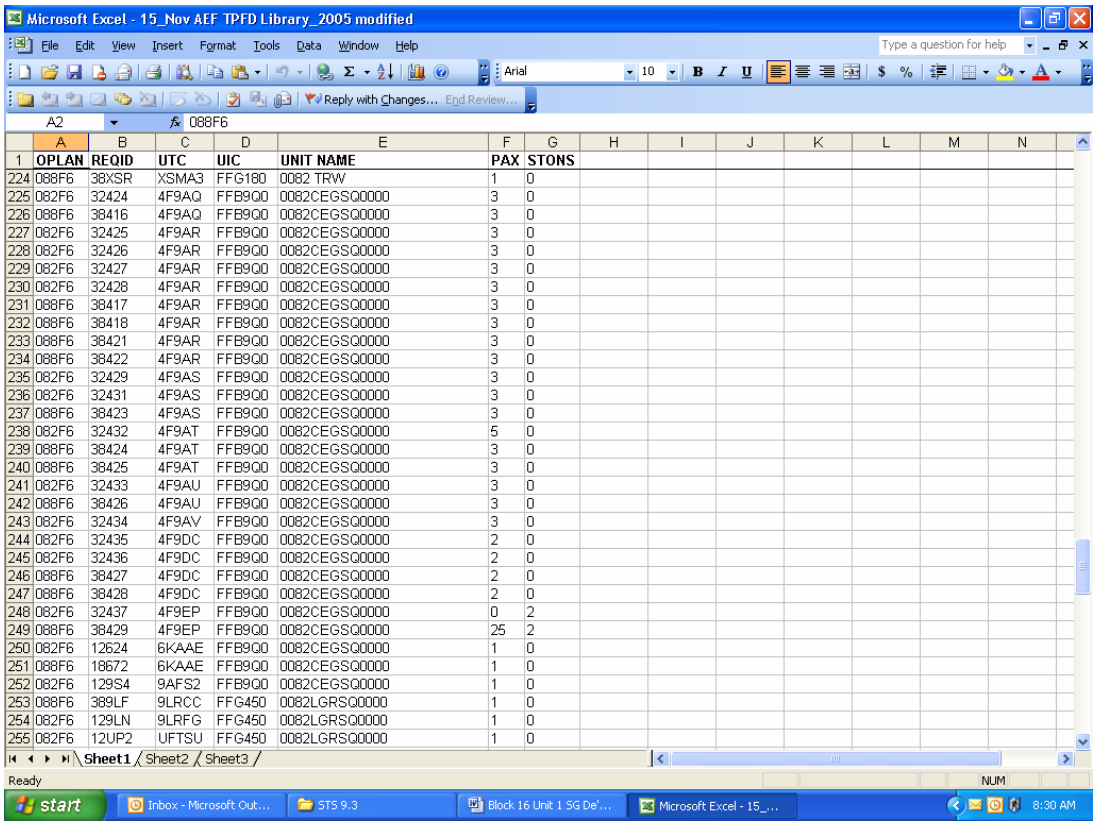
7. Mobility

d. Given applicable references, distinguish Time Phased Force and Deployment List (TPFDL) taskings and requirements with at least an 80% accuracy. STS: 9.5.5.4.

TIME PHASED FORCE AND DEPLOYMENT LIST (TPFDL)

The Time Phased Force and Deployment List or "TPFDL" is found in Appendix 1 to Annex A of the operation plan. It identifies the type and/or actual units required to support the operation plan, and indicates origin and ports of debarkation or ocean area. The TPFDL is generated as a computer listing from the Time Phased Force and Deployment Data. It is also a master database of all tasked combat and support units, both in- place and deployed forces. The database will include the transportation requirements to get those forces into position to support the requirement.

The TPFDD also makes it possible for the limited land, sea, and air transportation assets to move the Operational Plan designated units from their home station to the correct destination, in the proper sequence, and on time. This picture is an example of a TPFDD.



	OPLAN	REQID	UTC	UIC	UNIT NAME	PAX	STONS
224	088F6	38XSR	XSMA3	FFG180	0082 TRW	1	0
225	082F6	32424	4F9AQ	FFB9Q0	0082CEGSQ0000	3	0
226	088F6	38416	4F9AQ	FFB9Q0	0082CEGSQ0000	3	0
227	082F6	32425	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
228	082F6	32426	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
229	082F6	32427	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
230	082F6	32428	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
231	088F6	38417	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
232	088F6	38418	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
233	088F6	38421	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
234	088F6	38422	4F9AR	FFB9Q0	0082CEGSQ0000	3	0
235	082F6	32429	4F9AS	FFB9Q0	0082CEGSQ0000	3	0
236	082F6	32431	4F9AS	FFB9Q0	0082CEGSQ0000	3	0
237	088F6	38423	4F9AS	FFB9Q0	0082CEGSQ0000	3	0
238	082F6	32432	4F9AT	FFB9Q0	0082CEGSQ0000	5	0
239	088F6	38424	4F9AT	FFB9Q0	0082CEGSQ0000	3	0
240	088F6	38425	4F9AT	FFB9Q0	0082CEGSQ0000	3	0
241	082F6	32433	4F9AU	FFB9Q0	0082CEGSQ0000	3	0
242	088F6	38426	4F9AU	FFB9Q0	0082CEGSQ0000	3	0
243	082F6	32434	4F9AV	FFB9Q0	0082CEGSQ0000	3	0
244	082F6	32435	4F9DC	FFB9Q0	0082CEGSQ0000	2	0
245	082F6	32436	4F9DC	FFB9Q0	0082CEGSQ0000	2	0
246	088F6	38427	4F9DC	FFB9Q0	0082CEGSQ0000	2	0
247	088F6	38428	4F9DC	FFB9Q0	0082CEGSQ0000	2	0
248	082F6	32437	4F9EP	FFB9Q0	0082CEGSQ0000	0	2
249	088F6	38429	4F9EP	FFB9Q0	0082CEGSQ0000	25	2
250	082F6	12624	6KAAE	FFB9Q0	0082CEGSQ0000	1	0
251	088F6	18672	6KAAE	FFB9Q0	0082CEGSQ0000	1	0
252	082F6	129S4	9AFS2	FFB9Q0	0082CEGSQ0000	1	0
253	088F6	389LF	9LRCC	FFG450	0082LGRSQ0000	1	0
254	082F6	129LN	9LRFG	FFG450	0082LGRSQ0000	1	0
255	082F6	12UP2	UFTSU	FFG450	0082LGRSQ0000	1	0

Figure 7-4

Major Headings

The major headings on the TPFDL are listed below:

- ULN: The Unit Line Number is an alphanumeric code that uniquely identifies each force requirement within the TPFDD. (A UTC is an example of a force requirement. Each UTC tasked in this TPFDL's OPlan will have a unique ULN)
- UTC: The alphanumeric code for the tasked Unit Type Code. (This was discussed in objective 1c)
- Description: Short name of the UTC
- ULC: (Unit Level Code) describes the level of the unit for which the force requirement is stated. For example ELE = Element and TM = Team.
- UIC: (Unit Identification) Code is an alphanumeric code which uniquely identifies each Active, Reserve and National Guard unit in the Armed Forces.
- Unit Name: The unit providing the requirement.
- PERS/PAX – (Personnel / Passengers): Authorized personnel strength associated with the UTC
- Source: The agency designated to provide the UTC

- Origin: The location of the sourced unit. It is the beginning point of a deployment.
- Port of Embarkation: The location from which the unit will depart on its strategic deployment. (Basically were they leave the country. Kind of like a port call when you PCS oversees.)
- Mode: The means of transportation (air, sea, land) selected to move a force or equipment from one point to another, e.g. from the port of embarkation to the port of debarkation.
- Port of Debarkation: The location at which the unit ends its strategic deployment. (arriving in country)
- Destination: The final location the unit is required employ at. The port of debarkation and destination can be the same place

(Note: this is not an all inclusive list of the headings on a TPFDL.)

TPFDL Dates

- C-Day: The unnamed day on which a deployment operation commences or is to commence.
- RLD – (Ready to Load Date) The date when a unit will be ready to move from its origin.
- ALD – (Available to Load Date): Indicates when a unit will be ready to move from the port of embarkation.
- EAD – (Earliest Arrival Date): The earliest date when a unit can be accepted at the port of debarkation
- LAD – (Latest Arrival Date): The latest date when a unit can arrive at the port of debarkation and still support the concept of operations
- RDD – (Required Delivery Date): The date the unit is to arrive at its destination too properly support the concept of operations

7. Mobility

e. Given applicable references, describe the principles of SORTS with at least an 80% accuracy. STS: 9.5.6.1.

PRINCIPLES OF SORTS

Status of Resources and Training, better known as “SORTS” is an internal management tool used by the Chairman, Joint Chiefs of Staff (CJCS), Unified Commands, and Combat Support Agencies. When using SORTS is important to know that it is a single

automated reporting system within the Department of Defense that functions as the central registry of all operational units of the United States Armed Forces and certain foreign organizations

Figure 7-5

SORTS is an assessment of a unit's ability to successfully perform its designed mission or when deployed, it's assigned mission. It provides information on people, equipment/supplies on hand, equipment condition, and training needed for wartime missions. These are called measured areas

Purpose of SORTS

The purpose of Status of Resources and Training System is three fold:

1. Provides data critical to crisis planning

2. Provides data for the deliberate planning process

3. It is Used by the Chief of Staff, Air Force and subordinate commanders in assessing their effectiveness in meeting their Title 10, United States Code of Responsibility.

MAJCOM Responsibilities

At the Major command level, the MAJCOM or the Command Reporting Organization will maintain a current command SORTS database, oversees preparation of DOC statements and distributes them as required.

The MAJCOM Functional Area Offices will help resolve reporting problems, consolidates and submits any command remarks to add to unit reports. They will monitors unit SORTS reports to find problems, determine causes and possible

solutions. The MAJCOM Functional Area Offices also ensures a subordinate unit's DOC statement(s) reflect unit missions

Installation Level Responsibilities:

Wing Commander
At the installation level, The Wing Commander will ensure the SORTS reports for assigned units are accurate, timely, clear, and complete to include ensuring all personnel involved in SORTS reporting are trained to handle their responsibilities. They will provide remarks to add to reports to explain wing or base actions impacting on C- levels. The wing commander also appoints and ensures training is accomplished for at least two SORTS managers for the base.

Command Post
Also at the installation level, the command post normally acts as the OPR for SORTS, and will prepare all installation SORTS reporting to leave the base. They take on the functions of the Subordinate Reporting Organization. Some of the functions of the command post are to keep a record of the data currently in the database applicable to each unit. They enter only that C-level data approved by the commander of the measured unit into the SORTS database. They also notify units and staff agencies of reporting requirements. The command post SORTS managers will retain a copy of current DOC statements, work with necessary offices to resolve DOC statement discrepancies and gives measured unit technical assistance to help them prepare their inputs.

As the Wing SORTS manager the command post collects data from all measured units on the base to submit the information to the wing/installation commander for review. Acting as the subordinate reporting organization, the SORTS manager at the command post transmits the data to the SORTS computer at the Pentagon. Additionally, some MAJCOMs have their bases send the information to them and then forward it to the Pentagon. The SORTS manager is normally the person that updates the database. However, some bases allow the unit monitors to update the database themselves at the command post. No matter the path, your information is available for review by the JCS within hours.

Manpower Office
The Manpower Office at the installation level of SORTS produces automated data products that show current deployment planning, UTC taskings, and in-place wartime requirements.

Personnel Office
Like the Manpower office, the Personnel offices falls under the realm of the Installation level SORTS program and produces personnel management products to be used in SORTS

Measured Units:

Unit Commander
Under measured units falls the unit commander who's responsibility includes reviewing the data and the remarks on the unit SORTS report and assigns the overall C-level to include ensuring submissions meet reporting deadlines.

Readiness Flight Chief
The Readiness Flight Chief also has responsibilities under measured units and will prepare and review data. They will then prepare remarks on the unit SORTS report then check the report for quality before recommending the overall C-level to the unit commander. The Readiness Flight Chief will also ensure the commander reviews the report in time to meet reporting deadlines and assess potential problem areas that may cause the unit C-level to drop, advises the commander, and proposes solutions to those problems.

Additionally, the Readiness Flight Chief appoints and trains at least two SORTS monitors so the unit can deploy one in crisis and allow for peacetime leave without disrupting the reporting process. They concurrently review the unit DOC statements for errors.

SORTS Monitors/Preparers
Finally under measured units are the SORTS Monitors/Preparers. Their function is to prepare the unit SORTS report and C-level data to include extracting data from existing records. Prepare the SORTS report worksheets with measured area ratings and presents this information to the Readiness flight chief for validation and approval. After the Readiness flight chief approves the report, it is presented to the commander who determines the overall unit rating. The lowest measured resource area level is normally the unit's overall C-level. The monitor/preparer then provides the formatted information to the wing/base SORTS manager who is usually assigned to the command post. They also monitors/preparers and maintains information databases, calculate measured area percentages and levels, prepare remarks and checks the DOC statements for errors.

Classification of SORTS

The detailed SORTS data for a single unit, is classified at a minimum CONFIDENTIAL. The association of the unit with its Operational Plan tasking is classified at the level of classification of the appropriate Operational Plan. Other information could cause it to be classified as well. Contact your SORTS Manager if you have a question on classification. On this slide is an example of an unclassified SORTS report.

Figure A2.1. Sample AF Form 723, SORTS DOC Statement, Sample One-Page 1, Front.

THIS IS ONLY AN EXAMPLE

UNCLASSIFIED (When filled in)
SECURITY CLASSIFICATION

SORTS DOC STATEMENT

EFFECTIVE DATE	SUPERSEDES	MAJCOM/OPR *(Office Symbol and Phone No.)*
1998 04 01	1997 04 01	HQ AETC/SVX DSN 487-3410

I. ( ) UNIT IDENTIFICATION

MEASURED UNIT	HOME LOCATION	UNIT UTC	UIC
0325 SVS	TYNDALL AFB, FL	LWRRZ	FF300C

DOC MISSION TITLE	GEO LOC
SERVICES-PRIME RIBS-MOBILITY	XLWU

DOCID	DOCNR	X PRIMARY MISSION	SECONDARY MISSION	TERTIARY MISSION
UM27	1			

II. (U) MISSION IDENTIFICATION

A. (U) MISSION TASKING NARRATIVE. THIS UNIT HAS A WARTIME MISSION TO:
DEPLOY PRIME RIBS WORLDWIDE TO PROVIDE DIRECT COMBAT SUPPORT TO AF OPERATIONAL FORCES IN THE AREAS OF FOOD SERVICES, BILLETING; WARTIME MORTUARY OPERATIONS, FIELD LAUNDRY SERVICES, TACTICAL FIELD EXCHANGE, AND FITNESS AND RECREATION.

B. (U) MISSION SPECIFICS	C. (U) UTCs REQUIRED TO SUPPORT	D. (U) DIRECT SUPPORT UNITS UICS
RESPONSE TIME XX HOURS	LWRR2 (2)	N/A
SOURCE (para)		
AIRCRAFT / MISSILE UNITS ONLY		
MDS AND SERIES: ( )		
SORTIES/FLYING HRS (*WMP*): N/A		

E. (U) (*Optional*) OPLANS TASKED TO SUPPORT:

REF AETC WMP-3

III. (U) MEASURED RESOURCE AREA

A. PERSONNEL

X TOTAL UMD (*OR*) X UTC	X CRITICAL (*AFSCs from AFI 10-201 Table 3.1. RULE 19*)	DOD CIVILIANS INCLUDED

(U) ADDITIONAL NOTES:
REPORT PERSONNEL P-LEVEL IAW AFI 10-201 AND AETC SUP 1, CHAP 3, CHAP 2 para 2..15.3, AND PERSONNEL CHECKLISTS. LIST CRITICAL AFSC'S BY SKILL LEVEL ON CRITICAL PERSONNEL CHECKLIST(S) BY AFSC, AUTH, ASGN, AVAIL. DO NOT COUNT OVERAGES IN ASGN OR AVAIL CALCULATIONS.

AF FORM 723, OCT 98 *(EF-V1)* **UNCLASSIFIED** (When filled in) **SECURITY CLASSIFICATION** **DERIVED FROM:** **DECLASSIFIED ON:**

Figure 7-6

SORTS Reporting Process

By regulation, your units SORTS reports will be submitted at least once a month and within a 24 hour period of an event occurring that changes any measured area rating or reason code. This will also include being directed to do so by higher headquarters. When you begin your preparation for your SORTS report you will realize that there are few documents required. This list is not an all-inclusive one. AFI 10-201 is the source document for guidance on reporting SORTS and AFI 10-210 is the source document for Prime BEEF training requirements. In AFI 10-210 are the areas which training requirements are SORTS reportable for. The unit's DOC statement, part III. D tells you what training method to use on this report. Civil Engineer units use the standard worksheets to capture and pass SORTS data from the unit to the command post. The wing SORTS manager will provide copies of the worksheets you will use at your base whether they be paper based or electronic copies. In addition, you will also need any local reports that accurately reflect your unit's capabilities.

C-Levels

When talking about unit ratings we are talking about the C-Level. The C-level is a shorthand way of indicating a unit's readiness to perform its DOC specified mission.

The C-level descriptions on the next slide range from a unit being fully ready or capable to perform its wartime or assigned mission down to the units inability to perform any of its prescribed and or assigned tasks.

- C-1: The unit possesses the required resources and is trained to undertake the full wartime mission for which it is organized or designed.
- C-2: The unit possesses the required resources and is trained to undertake most of the wartime mission for which it is organized or designed.
- C-3: The unit possesses the required resources and is trained to undertake many, but not all, portions of the wartime mission for which it is organized or designed.
- C-4: Unit requires additional resources or training to undertake its wartime mission, but it may be directed to undertake portions of its wartime mission with resources on hand.
- C-5: Unit is undergoing a service-directed resource action and is not prepared, at this time, to undertake the wartime mission for which it is organized or designed. Note: this level can only be assigned if authorized by MAJCOM.
- C-6: Not to be used for overall C-level. Assigned by service direction, C-6 is reported for individual resources or training areas that are not measured.

In addition to C-levels reference to unit readiness or capability, these descriptions can also apply to the resource status of the four measured areas. However, the levels in the four areas are called different.

- P-level for personnel
- S-level for equipment and supplies on hand
- R-level for equipment condition
- T-level for training

C-Level Reporting:

Overall C-Level

When determining your overall C-Level there are many factors that must be completed. First, you must report the overall status of your unit to meet all mission requirements. When talking your units overall status, it must be the lowest level from the four measured areas. No matter how many UTCs you posture, you must consolidate the personnel, equipment or training data for all UTCs before you calculate the percentages in each measured resource area. If you are using ACES, this program will calculate your percentages for you and save you time.

SORTS Reporting Rules
Here are just a few of the general rules used when accomplishing your unit's SORTS report. When talking numbers, a person or piece of equipment can only be counted as available if they can be ready to deploy or perform the in-place mission within the specified DOC response time. Unless they are specifically allowed by your DOC statement, you cannot use the same person or piece of equipment to satisfy two requirements. Measured area status levels are based strictly on calculated percentages. Unlike C-levels, a unit may not adjust P-, S-, R-, and T-levels up or down based on any subjective criteria. If you would like to know more indebt, Refer to AFI 10-201 for a complete listing of SORT reporting rules.

SORTS Reporting Measured Areas

- P-level for personnel
- S-level for equipment and supplies on hand
- R-level for equipment condition
- T-level for training

Although we have mentioned these areas before, it is important to know that you must measure and report on the status of each measured resource area listed for your unit for SORTS.

Measured Area Summaries
Additionally in the blocks for each of the four measured areas, record the measured area rating and reason code. When filling out the measured summaries, enter the overall C-level into READY. The overall C-Level will be the lowest measured area, not including equipment condition, unless raised or lowered by the commander.

Civil Engineers measure their Prime BEEF training in three sub areas:

- Category I, Home Station Training or Classroom work
- Category II, Home Station Training or Hands on training
- Category III, Silver Flag Training or Training conducted at a Silver Flag exercise site

7. Mobility

f. Given applicable references, identify SORTS deficiencies and recommend/coordinate corrective actions with at least an 80% accuracy. STS: 9.5.6.2., 9.5.6.3.

SORTS DEFINCIENCIES

When talking SORTS deficiencies, you must remember that the overall C-Levels will be the lowest rating of the four measured areas. For example, if a unit is required to posture a 55 person bed-down team and they filled 53 of the 55 positions utilizing the substitutions rules, they would be a P-1. Another scenario you could have is all the required positions were filled but only 85% of personnel were fully trained in CAT I or CAT II, then that team would be T-2. This would be a identified as a training deficiency.

You could also use a shortage of equipment and supplies on hand as a deficiency if applicable. Any of the measured areas with the exception being equipment condition, not at the highest rating, would then be reported as a deficiency. You need to report any deficiencies to your Readiness flight chief immediately so corrective actions can be taken as soon as possible.

Measuring and Reporting Overall Status

The overall status of your report is the most important and critical part of SORTS because this is where the commander records their assessment of the unit's capability to perform its primary mission. The commander's judgment is essential because the calculated numbers may not adequately reflect the subjective strengths or weaknesses of the Civil Engineer unit.

Recommend/Coordinate Corrective Actions

When reviewing your SORTS report you identify an area that is not a P-1, T-1, or S-1, you must recommend corrective actions to your Readiness flight chief. The flight chief will in turn make recommendations to your unit commander. Of course, before you make any recommendations, do your research to see if your choices are sound, achievable and needed.

For example, if your unit has an overall rating of C-2 because your lacking the required personnel to fill a UTC, is obvious you are not going to recommend that the unit commander jump on the phone & call the MAJCOM to "fix" the unit's problem now. You will recommend a carefully worded remark stating that you would be a C-1 if you had the appropriate AFSCs and skill levels.

Another example of a recommendation is for training. If your unit is an overall C-2 because your unit is not fully trained, you could make a recommendation to conduct training after duty hours or on a weekend. That is something realistic, achievable and necessary.

Regardless of the measured resource area your using, if you need to make a recommendation, ensure you have conducted all of the proper coordination with the affected flights. It is important to remember, a large portion of our job is to network and foster teamwork within and outside of our unit. Once your recommendations have been made and corrective actions taken, the unit commander will then make their assessment of their unit's capabilities.

Unit Commanders Assessment

Unit Commanders have the prerogative to raise or lower the overall C-level, but may not modify the measured area rating. If you unit reports C-1, then your unit should be able to do everything required by your DOC statement. The commander should seriously question a C-1 if they notice significant deficiencies. If your unit is required to submit sub overall reports, do not report the lowest sub overall C-level as the overall unit C-level.

8. Prime Beef Management

a. Given applicable references, analyze the procedures to posture teams and utilize CE substitution rules with at least an 80% accuracy. STS: 9.6.1.4.1.

PRIME BEEF PROGRAM MANAGEMENT

Since the early days of aviation, the United States Air Force has developed and sustained airbases for the projection of air and space power. Development and sustainment have been achieved through our ability to mobilize and deploy these forces with a minimal amount of effort. In the Civil Engineering Squadron and especially in Readiness, we accomplish this through the Prime Base Engineer Emergency Force or Prime Beef program management used for posturing our potentially deployable teams under the guise of mobility. In this section we will cover how we posture, develop and track these teams to accomplish this critical mission

Figure 8-1

Posturing Teams

When conducting the critical wartime mission of mobility, the Readiness Flight must ensure that the civil engineering personnel are assigned to Prime BEEF teams. Readiness flight personnel along with assigned Unit Deployment Managers will ensure personnel are qualified to fill the positions, eligible to deploy and available to deploy with no delays. To complete this detailed procedure as accurately and efficiently as possible, there are several products both paper and computer based that aid the Readiness Flight in this task.

Figure 8-2

UTC Team Posturing

To support potential global crisis/contingency operations and Aerospace Expeditionary Force or AEF deployments, The MAJCOMs will posture all funded authorized military positions into standard deployable 4F9XX series, Unit Type Codes known as UTCs or associated (4FZZZ) UTCs. The Air Force goal is for every unit and installation to create the maximum number of standard deployable teams that their Unit Manning Documents known, can support and then to make those UTCs available for AEF deployments. All military personnel in a Civil Engineer unit, whether assigned to a standard deployable or an associate UTC, can be selected for both steady state and Operational Plan or OPLAN tasking's.

When posturing Prime BEEF UTCs, the parent MAJCOM will determine the best use of all its unit authorizations to meet the most stringent Operational Plan demands while maintaining flexibility to support AEF steady state requirements.
Those MAJCOMs will also posture UTCs at each Civil Engineer unit using the building block approach outlined in the Head Quarters United States Air Force War and Mobilization Plan or WIMP-1, Annexes S and J, to provide that total engineer capability.

Aerospace Expeditionary Force (AEF)

The Aerospace Expeditionary Force is the Air Force's detailed methodology for organizing, training, equipping and sustaining rapid response air and space forces to meet critical defense strategy requirements. The twenty month AEF life cycle is shown here on this slide.

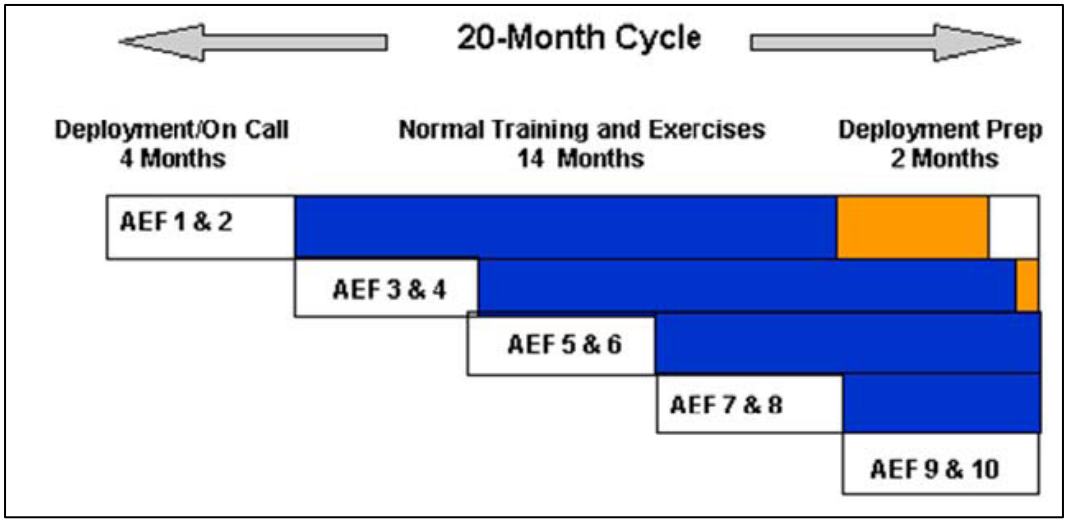


Figure 8-3

Posturing of Teams and Utilization of CE Substitution Rules

During the detailed task of posturing the Prime Beef UTC Teams, the Readiness flight must follow stringent guidelines or Civil Engineering substitution rules that govern this task. The Prime BEEF specific rules are listed in order of priority. You must first fill required UTC positions according to notes in the Mission Capability statements or MISCAP. When there are no notes, fill each UTC position using the following sequence:

- Individuals that are holding the Control Air Force Specialty Code at the required skill level.
- Officers will be assigned by Duty Air Force Specialty Code.
- Individuals holding a CAFSC one or two skill levels higher than required.
- Commanders may substitute one grade up for officers.
- An individual holding a CAFSC one skill level lower than required
- Commanders may substitute one grade down for officers
- Fire and emergency services must be tied to DoD fire certified skills
- Colonel's (O-6) and 3E000, 3E700, 3E800, and 3E900 positions cannot be filled by a person with a lower grade or skill level, unless allowed by the MISCAP
- Additionally officer positions may be filled by individuals holding any educational suffix.

The exception: 32E series Air Force Specialty Code requirements must be filled by a qualified officer (i.e. possessing the correct duty Air Force Specialty Code and grade)

Table 3.1. Authorized Substitutions Outside of the AF Specialty.

AIR FORCE SPECIALTY	AFSC	AUTHORIZED SUBSTITUTIONS FOR 5-SKILL LEVEL AND ABOVE	AUTHORIZED SUBSTITUTIONS FOR 3-SKILL LEVEL AND BELOW
Electrical	3E0X1	None	3E0X2, 3E1X1
Electrical Power Production	3E0X2	None	3E0X1, 3E1X1
HVAC & Refrigeration	3E1X1	None	3E0X1, 3E0X2
Pavements & Construction Equipment	3E2X1	None	3E3X1
Structural	3E3X1	None	3E2X1
Utilities Systems	3E4X1	None	3E4X2, 3E1X1
Liquid Fuels Maintenance	3E4X2	None	3E4X1, 3E1X1
Pest Management	3E4X3	None	None
Engineering	3E5X1	None	None
Operations (see note 1)	3E6X1	3E0X1/2, 3E1X1, 3E3X1, 3E4X1/2/3, 3E5X1	None
Fire Protection	3E7X1	None	None
EOD	3E8X1	None	None
Readiness	3E9X1	None	None
Inventory Management	2S0X1	2S0X0	2S0X0, 3EXXX
Education & Training (see note 2)	3S2X1	3A0X1	3A0X1, 3S0X1
First Sergeant	8F000	3EX9X, 3EX7X	

NOTES:

1. Only individuals holding a 5- or 7- skill level in the listed AFSs can substitute for a 3E6X1 requirement.
2. Applies only to 4F9EW, 4F9EY, and 4F9EZ UTCs.

Figure 8-4

Note: The current authorized substitutions outside of the Air Force Specialty are listed in this Air Force Instruction10-210 table as seen on this extract.

Critical Personnel Substitutions in SORTS

When posturing Prime Beef Teams, make sure not to confuse the substitution rules used for assigning people to UTC positions with the rules used to measure critical personnel for Status of Resource and Training better known as SORTS. During SORTS measurements only, you may NOT count a critical position as filled when the individual assigned to the position holds a control or primary Air Force Specialty Code or skill level that is lower than the required Air Force Specialty Code or skill level needed.

For More information see AFI 10-201, paragraph 3.1.2 for a complete explanation of these rules.

8. Prime Beef Management

b. Given applicable references, analyze the steps necessary to utilize personnel products such as DESIRE Lists with at least an 80% accuracy. STS: 9.6.1.4.2.

UTILIZATION OF PERSONNEL PRODUCTS

When determining personnel availability is will be necessary to look at several different products to produce the data needed for this task.

Determining Personnel Availability

When you begin posturing a Prime BEEF team, look at each Air Force Specialty Code skill level and match that skill level with a person from your UMD, DRMD, PRR, PRRR, or MRRR. These products and documents will be critical in your quantification of personnel requirements to meet the wartime mission dictated on the UTC DOC Statement you are working off of.

Desire Lists

Detailed desire lists are obtained from the Personnel System Management Section in the Military Personnel Flight known as the MPF. "Desire list" is a generic term used for information, reports, documents or reports retrieved from the MPF personnel computer system. This computer system contains large amounts of information on each individual assigned to the base to be used for mobility purposes. The users define the information that is needed and the format it is to be presented in. The information can be sorted in just about any way the user wants or needs. Users must have a valid approved reason for obtaining the information before they can access the system. In the next few slides are a few of the products Readiness Flight personnel can obtain from the MPF.

The DESIRE lists can and will include any disqualifying codes for Civil Engineering personnel. This code is usually on the far left of the same line as the individual's name and personnel data. Some of these codes can prevent an individual from being available or even eligible for deployment. Unit personnel may be considered available if they are assigned to the unit and meet one of the following requirements:

- Are present at home station or can be present within the prescribed unit response time
- Are at a deployed location and can be ready to redeploy within the unit response time

- Are not restricted from deploying or employing with the unit. Only for units with a mobility mission
- Are counted if their duty status and or availability codes, on a SORTS Personnel Availability Roster and the Duty Status Roster, match those from Air Force Instruction 10-403, and the commander determines that they are available where appropriate
- Personnel having a duty status or availability code restricting them from deployment in accordance with AFI 10-403, may be considered available for in-place missions as determined by the commander.
- Such as, Ineligible or Non-Available Personnel

Note: For more information refer to deployment availability codes in AFI 10-403, Attachment 2

Unit Manning Document (UMD)

The Unit Manpower Document is obtained from the Base Manpower Office. It will list all authorized positions by AFSC and grade for each cost center in a unit. It also identifies wartime required positions (this mainly applies to in-place missions). This document is useful when determining if you have the required manning to meet your mobility tasking's.

Deployed Requirements Manning Document

The Deployment Requirements Manning Document is obtained from the Personnel Readiness Unit at the MPF. It is a database that can generate a paper report of your unit deployment requirements as well as necessary manning information. The Deployment Requirements Manning Document list the individuals, "faces to spaces," that are deploying for each position on a UTC. It also shows chalks, deployment sequence and any remarks. Remarks will include individuals identified as team chief, cargo/weapons couriers, etc. A variety of information is also available on the Deployment Requirements Manning Document. An individual Deployment Requirements Manning Documents is prepared for each Operational Plan or deployment tasking. The information from the DRMD is used to prepare the CED (contingency, exercise, mobility) orders as well.

Personnel Resource Requirements Roster (PRRR), Personnel Requirements Roster (PRR)

The Personnel Resource Requirements Roster PRRR and the Personnel Requirements Roster PRR are obtained from Personnel System Management Section in the Military Personnel Flight (MPF) as well. This is a pre-designed desire list product that lists information on individuals such as name, social security number, air force specialty code, deployment availability codes, special experience identifiers and other personal information on the member queried. The basic format for this report may vary from base to base so you must get with your servicing MPF for guidance. This product will

be very critical in identifying people for placement on a UTC team and for ensuring they are available and eligible for deployment.

Mobility Requirements Resources Roster (MRRR)

Mobility Requirements Resources Roster or MRRR is obtained from the Base Manpower Office or the Personnel Readiness Unit at the MPF. The Mobility Requirements Resources Roster is created using information from the MANPER-B personnel computer system used for mobility by the MPF. This system shows, by UTC, all mobility positions that a unit is required to posture for its wartime mission. It will also list individuals filling primary as well as the alternate mobility positions. It is capable of showing the chalk they will be deploying on and the deployment sequence in that chalk as well as other information critical to the mobilization and deployment process.

9. Exercise Evaluations

a. Given applicable references, determine what advice should be given to the Exercise Evaluation Team (EET) chief with at least an 80% accuracy. STS: 9.7.2.

EXERCISE EVALUATIONS

The installation commander will establish an Installation Exercise Program Office (IEPO), as outlined in AFI 90-201

EET Team Chief

The IEPO will appoint an EET Chief in the grade of Major or above. Assign functional area evaluators based on the scope of the installation EM Plan 10-2 functional support area and operational mission. The EET Chief and IEPO staff may be selected from any organization or career field as deemed appropriate for the installation.

EET Team Chief Responsibilities

As the appointed EET Team Chief, there are a number of responsibilities that must be accomplished. Some of the major ones are listed as follows:

- Determines the number of evaluators and ensures they are trained in the areas they are evaluating.

- Plans and develops an exercise schedule. Develops checklists or procedural guides for exercise evaluation based on plans, directives and other checklists. Deficient areas from previous exercises will be reevaluated as special objectives in the next scheduled exercise of the same type. EET members will assist the EET Chief with exercise development.

- Provides debriefings, critiques and reports for each exercise to all participating agencies including the installation commander.

- Coordinates exercises with the fire chief, safety and the chief of air traffic control operations. The Fire chief must receive a minimum of 30 minutes advance notification prior to exercise initiation. For overseas installations, exercises must be coordinated with host nation officials.

- Updates the local EET program management directive to include such elements as team composition, equipment, training, prop requirements, planning and reporting procedures.

- Briefs the installation commander and staff during the RB on the status of the installation exercise evaluation program.

Installation commander approves the use of training munitions. Training smoke generating devices or ground burst simulators, planned for use during an exercise, will be listed in the exercise scenario. Only trained EET members may have access to and are allowed to expend these munitions. See AFCAT 21-209, *Ground Munitions* and AFMAN 91-201, *Explosives Safety.*

9. Exercise Evaluations

b. Given applicable references, analyze the steps necessary to prepare exercise objectives with at least an 80% accuracy. STS: 9.7.3.

EXERCISE EVALUATIONS

Education and training, supported by realistic exercises, are vital to ensure the Air Force can conduct Air Force Emergency Management operations. The challenge is to intelligently use exercises, evaluations and inspections to enhance response and survivability.

Primary Objectives

Therefore there are two primary objectives to the Air Force EM exercise and evaluation program.

1. The first objective is to enhance readiness, improve crisis response, streamline procedures, identify critical cyber and physical infrastructures and their potential vulnerabilities, and help unit's master OPLAN tasking's. As well as to provide important feedback to units and commanders on the adequacy of contingency planning, preparations and training.

2. The second objective is to provide realistic, integrated, large-scale training for the installation and response personnel, determining the installation's capability to respond, operate and recover from combatant and noncombatant contingency operations and homeland security threats.

Exercise Policy

To help meet these objectives the exercise and evaluation program policy is as follows:

- 1) Inspector General and EET will use uniformly applied standardized exercise evaluation criteria.
- 2) Exercises should be conducted during IG visits and may be conducted during staff assistance visits.
- 3) MAJCOM, FOA or DRU headquarters must provide guidelines on ground rules, evaluation areas, report formats and grading criteria for exercises. Based on installation capabilities and shortfalls, exercise scenario requirements may be waived. Real–world incidents may be substituted for exercise requirements if the incident requires the activation of the DRF, and after-actions lessons learned reports are written and distributed.
- 4) Include tenant units and ensure they participate in the installation exercise program.
- 5) Primary and alternate DRF personnel must each take part in at least one exercise per year.
- 6) National Security Emergency Preparedness plans must be evaluated, according to theater commander guidance, at a minimum annually, as part of emergency action procedures during exercises. Theater commanders shall decide on exercise requirements for NSEP in support of planning orders, warning orders, functional plans, and special events. And finally,
- 7) Coordinate with the staff judge advocate and local civil authorities before conducting an off-base exercise.

Setting Objectives

The first step necessary to prepare exercise objectives is to understand that exercise objectives are precise, action-oriented statements of the goals of the exercise. You should develop specific objectives for each exercise to ensure the unit exercise prepares the unit to master the full range of their contingency tasking's including O-PLANs, anticipated combat tasking's, and non-combat contingency tasking's.

Exercise Objective Sources

The next step to prepare objectives is to seek out specific unit taskings. There are many sources to investigate. These documents might include; previous exercise After-Action Reports, Joint Universal Lessons Learned, observation reports, publications and directives, mission requirements, OPLANs and procedures, training requirements, inspection or evaluation results, mission area analyses, and current doctrine issues.

Developing Exercise Objectives

Following the review of documents ensure that the exercise's design, Control Staff Instructions, artificial inputs, level and extent of player participation, and scenario support the exercise objectives.

Remember objectives should be developed from tasks on appropriate (AF, MAJCOM, NAF, Wing or Agency) Mission Essential Task Lists. AF objectives should be feasible within the larger Joint Staff exercise concept. Also resource limitations should be considered to ensure the AF receives the greatest return for its resource expenditure. *This process may be completed 12 months prior to STARTEX.*

Installations are encouraged to develop and conduct exercise objectives that meet multiple exercise category requirements within a single exercise.

- For example, an off-base WMD, mass casualty exercise could fill requirements for three types of exercises.

10. Readiness Flight Training

a. Given applicable references, determine installation-training requirements with at least an 80% accuracy. STS: 10.2.1.

READINESS FLIGHT TRAINING

Determine Requirements

There are four simple steps used to determine your installation-level training requirements:

1. Identify installation missions.
2. Identify hazards associated with those missions
3. Identify natural disaster threats likely to occur on your installation
4. Combine these together with the appropriate Courses of Instruction

Identify Installation Missions

The first step "Identify installation missions". To determine your installation-level training requirements, you must first identify installation missions. Ask yourself this question: Does the installation have a peacetime, wartime, or Military Operations Other Than War (MOOTW) taskings? As with performing the steps of a Hazard Analysis you will need to refer to many documents that will task your installation.

Identify Hazards

Your second step is "Identify hazards associated with those missions". Once you have identified your installation missions, you'll need to know the hazards that associate those missions. This again is the same information you will get from your installation hazard analysis.

Identify Natural Disaster Threats

The third step, "Identify natural disaster threats likely to occur on your installation". Again you can refer to your installation documents to answer this question…namely the EM Plan 10-2.

Course of Instruction

Last step, "Combine these together with the appropriate Courses of Instruction". What Courses of Instruction do you require? You can find this information in AFI 10-2501 and Supplements that associate.

Some basic examples are:

- Readiness Support Team Training
- Shelter Management Team Training
- Contamination Control Team Training
- Unit EM Representative Training
- Disaster Control Team Training
- Exercise Evaluation Team Training
- Chemical, Biological, Radiological, Nuclear and High Yield Explosive Defense Training
- Base Emergency Preparedness Orientation Course
- Unit Control Center Training
- HAZMAT Awareness Training
- Specific requirements for who requires the training and when they need the training can be found in AFI 10-2501.

10. Readiness Flight Training

b. Given applicable references, analyze the steps necessary to develop a installation-training program with at least an 80% accuracy. STS: 10.2.2.1., 10.2.2.2., 10.2.2.3.

READINESS FLIGHT TRAINING

Now that we determined our installation-training requirements we must analyze the steps to develope our installation-training program. This includes preparing schedules, maintaining training documentation and developing a trend analysis.

Course Information

After you have determined your training requirements, you need information about each course in order to prepare a schedule. You can find that information in AFI 10-2501, AFPAM 10-219, vol 1, and on the Education & Training Course Announcements website **https://etca.randolph.af.mil/** . These locations describe each Readiness course and provide the course length and time approximations. Here is an example from the ETCA website:

COURSE ID: **ZZ132001** ***TITLE:*** **Base Emergency Preparedness Orientation (BEPO)**
PDS: **BEP*****DATE ADDED:*** **2/1/1999*****AFSC:***
DATE UPDATED: **6/23/2003** ***CATEGORY:*** **To Be Determined** ***DOD CODE:***
SECURITY: ***START DATE:*** ***MASL:***
AIRCRAFT: ***LOCATION:*** **TBD BY BASE LEVEL**
LENGTH: **30 minutes**
ORG/PGM: **Ancillary Training / Awareness Ancillary Training Programs**
CLASS FREQ: **Initial/Refresher** ***ADSC DESC:*** **None**
WEBLINK: COURSE CONTACT: **HQ USAF/CEXR /**

Course Description:

Objective: Provides information on applicable seasonal hazards and protective actions; threats posed by attacks, major accidents, and natural disasters likely to occur at the installation and security measures, and base recovery actions.

Figure 10-1

Course length, assuming proper course development and instructor credentials, is the time needed to meet the learning objectives of the applicable RTP's and MAJCOM, FOA, direct reporting unit, or base additives. Be sure to meet training objectives in initial training and use exercises to the fullest extent to reinforce initial training knowledge.

Refresher Training

Design refresher training courses to maintain currency, to revisit subject areas in which students are deficient, and to acquaint personnel with changes in procedures and the use of new readiness material.

Prepare and Provide

When preparing the training schedule we work with unit commanders, staff agency chiefs, unit training managers, and the EET chief to establish a suitable scheduling system. Readiness will also coordinate and provide training schedules to the same afore mentioned personnel. From there it is the unit's responsibility to send their personnel to the appropriate course of instruction.

Factors

To develop the schedule, you can use a computer product. Base the schedule on an estimate of how many people need training and how much training the readiness flight is capable of doing. Factors to consider when developing the schedule are as follows:

1. Availability of instructors
2. Classroom capacity
3. Peak leave/vacation periods
4. Unit deployments
5. Other scheduled events such as wing exercises, AEF rotations, etc.

Documentation

At this time the process is not complete, following a training course we must ensure that we maintain the documentation. This requires communication with each of the units that had personnel attend the course. Following the course send documentation of each attendee to the appropriate POC. Readiness will maintain a copy of sign-in rosters from each course and maintain them in the file plan. This can also be accomplished electronically.

Trend Analysis

The last process is to develop a trend analysis. This is the process of tracking who attended and who didn't attend the courses. The trends we uncover will help us in ensuring our scheduling process works. Readiness can then address problem with scheduling and correct it.

11. Emergency Management (EM) Operations

a. Given applicable references, describe facts about the installation Emergency Management Program with at least an 80% accuracy. STS: 11.1.1., 11.1.2., 11.1.3.

EMERGENCY MANAGEMENT PROGRAM

This unit will cover the following areas: Basic facts of Emergency Management Operations, facts on terrorist use of WMD, how to analyze steps for installation response to terrorist use of WMD, basic facts about CBRNE attack actions, how to analyze steps to execute CBRNE attack action, basic facts about natural disasters, the natural disasters phases of response, principles of notification for major accident, phases of response for a major accident and facts about nuclear weapons accident.

Overview

This objective will cover Emergency Management guidelines, how to identify program deficiencies and recommend corrective action.

AFI 10-2501 Chapter 1

The readiness flight is the installation office of primary responsibility (OPR) for the EM Program. EM is defined as “a cross-functional program that integrates procedures and standards for planning; logistical requirements; emergency response actions; exercises and evaluation; training of personnel; detection, identification, and warning; notification; and enemy attack actions.

EM is responsible for ensuring the base has the ability to respond to, and recover from, the effects of attacks, terrorist use of weapons of mass destruction (WMD), natural catastrophes, or major accidents; to restore primary mission assets after these events; and to fulfill the humanitarian relief responsibilities of commanders. By accomplishing its mission, the CE squadron supports the installation EM
Program.

Our primary objective is to ensure mission continuation while maximizing force survivability.

Program Deficiencies

When identifying deficiencies in the Emergency Management program y use a combination of AFI 10-2501 and pre-developed staff assistance visit checklist from your specific MAJCOM. Some major areas of emphasis should be Program emphasis and

unit support, EM planning, CE Readiness program management, CE Readiness training, CE Readiness logistics.

Corrective Actions

Use staff assisted visit and self inspection checklist to identify corrective actions. If no corrective action can be found seek help from your major command functional manager.

11. Emergency Management (EM) Operations

b. Given applicable references, describe facts about terrorist use of WMD with at least an 80% accuracy. STS: 11.2.1.1., 11.2.1.2.

TERRORIST USE OF WMD

This objective will cover: WMD threat response pillars as well as principles and responsibilities

WMD Response Pillars

While the phases of operations…notification, response, withdrawal and recovery are appropriate for HAZMAT operations and major accidents, Air Force Handbook 10-2502 establishes a paradigm for response to a terrorist WMD incident/attack. This paradigm shift views for a potential incident in three phases: pre-incident, incident, and post-incident, emphasizing pre-incident planning across the installation functional areas for efficient incident and post-incident response.

The eight operational tasks of the WMD Threat Planning and Response Tree encompass the three response phases—pre-incident, incident, and post-incident providing for enhanced planning and response for a terrorist WMD incident/attack.

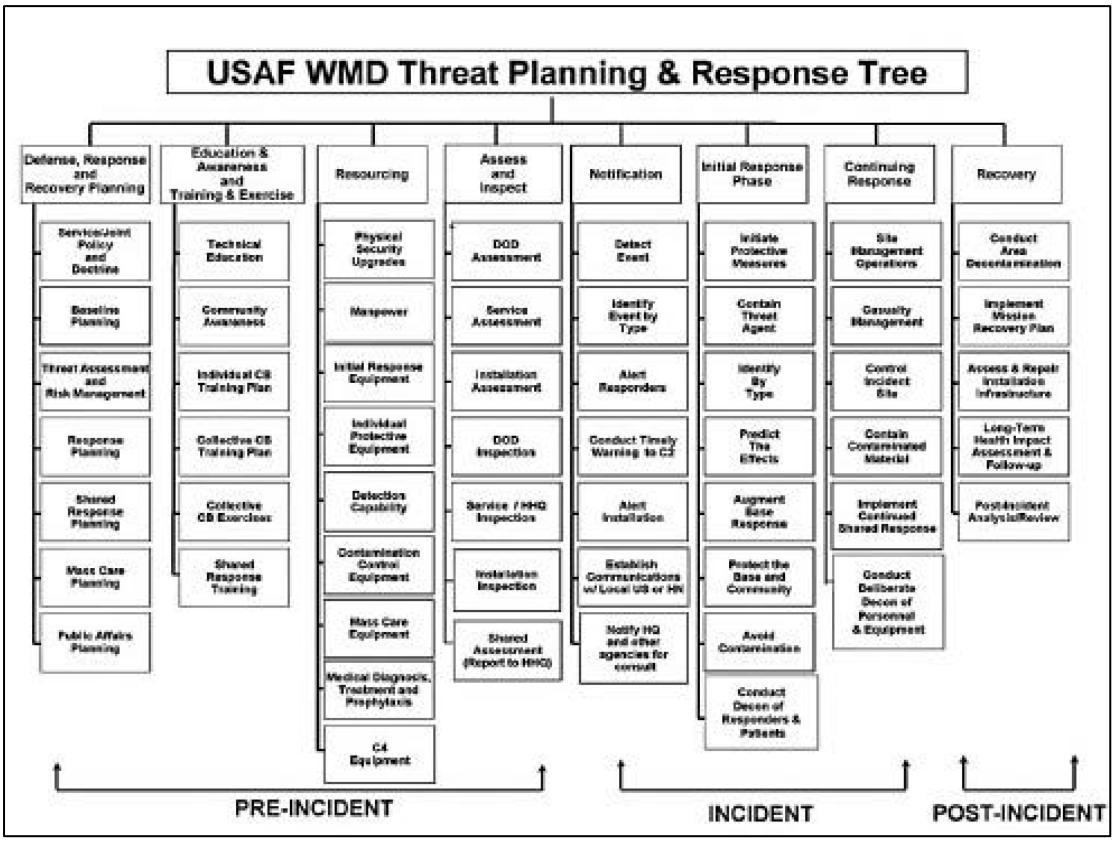


Figure 11-1

Within these phases, all installations should be able to effectively mitigate the threat and continue mission critical activities, either through containment of the threat or by relocating the mission to an alternate operating location, so as to minimize mission disruption.

Currently every Air Force installation may not be adequately resourced, or technology may not be available to implement all enabling tasks to successfully meet the USAF goal. However, all installations should identify the resources necessary to reduce, prevent, respond to, and recover from a terrorist WMD incident/attack.

Each installation should plan, train, organize, equip, and be prepared to execute a WMD response to detect, assess, contain, and recover essential resources, protect personnel and continue the mission.

1. Be able to detect, assess, contain and recover in the event of a terrorist WMD incident, without significantly impacting its war fighting capabilities.

2. Use its planning team to assess or expand its current HAZMAT emergency

response capabilities to include all functional area responsibilities and the terrorist WMD threat (it is important to note that response to a biological incident may not fall under traditional HAZMAT response).

3. Ensure that pre- and post-incident terrorist WMD threat response measures are adequately planned, and personnel are properly trained and exercised. *AFH 10-2502 30 October 2001*

4. Ensure that pre- and post-incident terrorist WMD Threat response measures are cross-functionally linked.

Figure 11-2

The pillars are necessary to accomplish the USAF goal. Pillars 1 to 4 are achievable through a focused and unified effort on behalf of installation commanders, planners, staff, and responders.

All installations should provide, or arrange for, the capability (memorandum of agreement (MOA), memorandum of understanding (MOU), SOFA, etc.) to: *detect* a WMD device and identify the incident by type; *assess* its potential effect on the base populace and local community; *contain* the incident; and begin initial steps toward *recover*y.

Each installation should plan, train, organize, equip, and be prepared to execute a minimum baseline response (using the detect-assess-contain –recover critical actions) to address emerging terrorist WMD threats. That minimum baseline capability includes the following:

Detect
Detection includes pre-incident actions and incident actions.

Active detection encompasses those pre-incident protective and *defensive* measures taken by an installation. These proactive, disaster preparedness measures help installations mitigate the likelihood and severity of an incident.

Initial response detection begins with the aware observer who reports a potential incident. (Note that the notification phase operational task is encompassed in this step.) *AFH 10-2502 30 October 2001*

Detection continues with the initial response element. The initial response element should have a continuous (24 hours a day, 7 days a week) initial detection capability (Figure 10) that encompasses all terrorist WMD threats.

Assess
The response continues with an initial evaluation to quickly determine the scope of the incident and level of response required.

Although assessment is a continual process that does not end until recovery is complete, the initial assessment task encompasses:

- Immediate notification of the HAZMAT response team, installation command and control nodes, USAF community, families, and local or host nation civilian community if the initial report indicates that it is warranted. (During a biological event, agent identification may occur some time after the actual event.)

- Evaluation of the problem (type of incident, probable size of the incident, physical or environmental conditions or impacts).
- Evaluation and selection of response options, selection of an appropriate
- response strategy, and establishment of response objectives (based on each installation's organic capability).
- Determination of a hot zone for each WMD incident. Each incident

requires a different systematic search pattern.

Contain
Assessment is based largely on the responders' experience and ability to look at and address the situation; containment actively implements the response the assessment indicated as most appropriate.

The standard for all installations should be maintaining the minimum response capability required to reduce or isolate an incident in order to mitigate or prevent further risk or damage to persons, materiel, facilities, and the environment Containment may not be possible or necessary during a biological incident.

Each installation's containment capability begins with the existing HAZMAT emergency response team's capability, but must be expanded to meet the minimum baseline containment capability.

Responders should take every precaution possible to preserve evidence after a terrorist event. This evidence will be crucial in the investigation, arrest, and conviction of the perpetrator(s) and should come second only to preservation of life, limb and property.

Recover
Proper response during an incident is key to recovery to ensure continuation of the USAF's strategic force-projection mission.

Recovery is a logical extension of the initial steps taken in the containment task. Recovery operations may quickly exceed an installation's capability.

Installation planners should address and incorporate recovery operations in all applicable installation plans.

Principles and Responsibilities

The Air Force should use the installation Disaster Response Force (DRF) to maintain command and control in responding to a terrorist WMD incident/attack. The DRF consists of the designated installation command post, the Disaster Control Group (DCG), the Initial Response Element (IRE), Follow-On Elements (FOE), Unit Control Centers (UCC), and any support and recovery teams—HAZMAT, EOD, or Shelter Management Teams inherent to the installation

Installation Command Post
The installation commander normally operates out of the designated installation command post. The command post is responsible for controlling all activities so the installation can support tasking's or requests from the incident site and keep higher headquarters informed. It serves as the command and control element that provides guidance, both directive and nondirective, on support and

operational procedures for the installation's WMD response and serves as the focal point for base-wide notification.

Disaster Control Group (DCG)
The DCG provides on-scene command, control, communications, and functional expertise for military resources. The DCG will normally consist of the On-Scene Commander (OSC) and designated functional area representatives. The wing or installation commander will determine the specific configuration of the DCG based on the situation.

The OSC is the designated representative of the installation commander. Typically the mission support group commander assumes this role and responds to the scene while the installation commander directs activities from the designated installation command post.

The DCG members coordinate operations and support requirements with their unit control centers and provide a liaison with response elements.

Unit Control Centers (UCC)
The UCC's provide a focal point within the installation to monitor unit resources and mission capability and to coordinate activities during a response.

Initial Response Base (IRB)
The IRE is responsible for initially responding to the incident site during a terrorist WMD situation. The security forces will contain and/or neutralize any hostile forces in the areas before a response can begin. The Senior Fire Official (SFO) then assumes control of the incident site until the installation commander's designated OSC arrives. After any hostile force actions, necessary fire suppression and casualty evacuation, an Initial Entry Team (IET) will enter the site for full assessment of the situation. The IET is led by EOD (or equivalent) for all real or suspect WMD incident/attacks. The DCG and designated OSC may or may not be physically located at the incident site, depending on the situation as reported by the SFO.

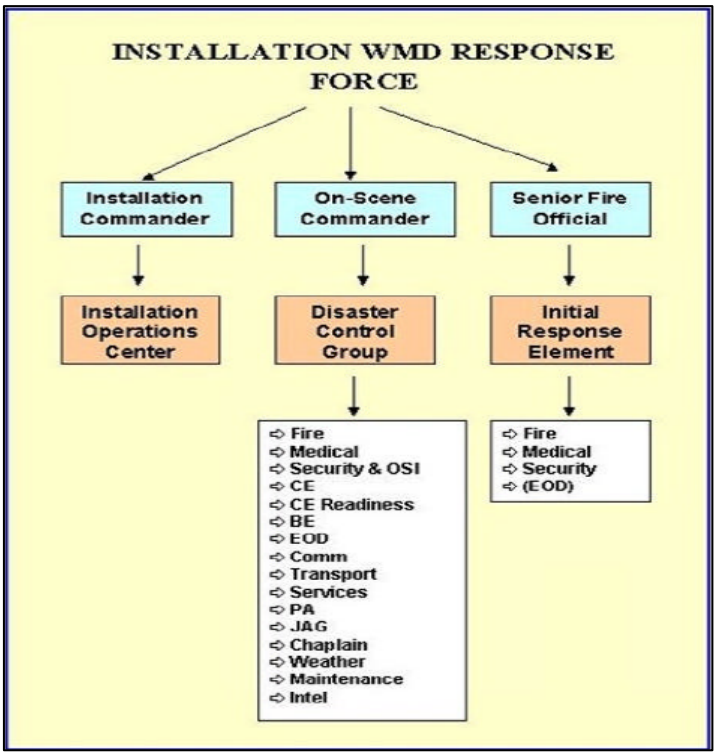


Figure 11-3

11. Emergency Management (EM) Operations

c. Given applicable references, analyze the steps necessary for installation responses to terrorist use of WMD with at least an 80% accuracy. STS: 11.2.1.3., 11.2.1.4., 11.2.1.5.

INSTALLATION RESPONSE TO TERRORIST USE OF WMD

This objective will cover how to determine planning and response requirements, how to evaluate the installation response capability and how to Implement the planned response.

Determine Planning and Response Requirements

Threat response must begin long before an incident occurs. Initial planning should be based on the local WMD threat assessment and terrorist intentions and capabilities. Consider the local threat in planning. Local emergency response planning guidance can

be found in AFI 10-2501, *Full Spectrum Threat Response Planning and Operations.* The threat assessment should be continuously updated and disseminated.

The installation should then tailor its response capability to the installation's mission and the specific threat assessment. Planning the response to an incident should include a task assessment, designation of the functional area to perform each task, identification of installation response capabilities, shortfalls, additional resources, and funding requirements.

Steps in Establishing an Installation Response Capability

Determining the planning and response capability begins with establishing an installation response capability. Some steps in establishing a response capability are: Identifying installation resources available to respond to a WMD incident/attack, assessing shortfalls between installation resources and the HQ AFCESA, getting a baseline Data Assessment Equipment List, identifying mutual aid or host nation resources, including available contracted services to supplement the installation response

Assessing overall capability (installation plus local or host nation support, and contracted support.), assessing requirements beyond the HQ AFCESA Baseline Data Assessment, identify the equipment List, and determining shortfalls; report major deficiencies to higher headquarters. These are visually depicted in the next picture.

Figure 11-4

Evaluate Installation Response Capability

Inventory Installation Resources

The first step in assessing capabilities is to conduct a detailed inventory of existing response resources and organizations, including equipment and trained teams and personnel. Using this inventory, each functional area should determine its ability to respond effectively to terrorist WMD incidents, using the WMD Threat Planning and Response Tree, the WMD Incident Master Checklist, the WMD Decision Tree, and the functional area checklists as a guide.

Assess Installation Shortfalls

As described in the USAF WMD Threat Response Pillars (figure 9), the installation response planning ensures, *at a minimum*, that each USAF installation regardless of its mission is capable of detecting, assessing, containing and initiating recovery actions (within its capability) necessary to resume operations following a terrorist WMD incident.

Once the commander has determined the installation's initial equipment capabilities required for terrorist WMD threat response, those capabilities must be compared to the current Recommended WMD Equipment. To facilitate the installations' overall assessment, list shortfalls in categories that are standardized across functions.

Identify Mutual Aid or Host Nation Resources

If the installation's response capabilities fall short of the Recommended WMD Equipment List, the installation should analyze what resources could be made available under MOA or MOU. An installation can augment its resources through cooperation with local or regional agencies, other nearby USAF and DoD resources, or host nation resources. These additional support elements might include HAZMAT teams, fire departments, emergency medical services, public health offices, law enforcement agencies, environmental agencies, and contracted response and remediation companies.

Assess Overall Capability

The commander should assess the installation's overall capability across the functional areas by considering both installation resources and augmented capabilities attained through MOA/MOUs. The combination of these resources should assist the installation in more closely achieving the minimum response capability.

Determine Requirements Beyond Minimum Response Levels

For some installations merely ensuring capabilities at the minimum response level will be insufficient. The commander may wish to implement a higher standard of response capability based in part on: Criticality of the installation's mission in the event of a conflict, sensitivity of the installation's location, proximity

of the installation to vulnerable or essential population or assets, inaccessibility of mutual aid or host nation support.

Determine Shortfalls; Report Deficiencies to Higher Headquarters
When weaknesses or shortfalls are identified, the installation commander should prioritize resource requests and submit them to higher headquarters for consideration for future funding. Because it is unlikely that resource requests will be immediately addressed, installations will often respond with resources on hand. As such, planning should be based on the resources that are currently available.

Implement Planned Response
Deterring a terrorist WMD incident/attack should be a primary goal of any installation. The planning committee or working group designated by the installation commander will oversee: operational pre-incident tasks such as defense and response, recovery planning, education and awareness, training and exercising, resourcing and assessment and inspection.

Notification Operational Task
Notification begins when a report of the WMD incident/attack arrives at a link in the notification chain, whether it be the control tower, fire department, emergency room, security forces, or command post. All installation personnel should notify the proper authorities of a suspected terrorist incident. Typically, installations will use the primary and/or secondary crash nets to notify fire, medical, security forces, and the remainder of the DCG.

Initial Response Operational Task
The initial response phase begins when the Initial Response Element (IRE) which consists of firefighters, security forces, and medical responders and in some cases EOD. These forces deploy to the scene of the incident. These initial or first responders must approach the incident area with care, to avoid becoming victims themselves. They must be cognizant of warning signs indicating the presence of lethal agents or potential hazards; they must be aware WMD incidents may be masked by a hostage situation, disgruntled employees, protests, or accidents.

If there are suspected indications of a WMD incident/attack and the presence of hazardous agents, qualified first responders will use the appropriate level of protective gear, before any rescuers enter the hot zone, the SFO/OSC will determine the cordon size based on the presence or suspected presence of hazardous agents by type, first responders must have agent detection capability that will allow them the ability to identify specific threats, a hazard prediction will be conducted based on the type of agent and weather conditions, if it is apparent that the incident will affect a portion of the base populace or local community, the OSC should initiate procedures to warn, advise, or evacuate personnel, every effort must be made to avoid further contamination of first responders and the

base populace, firefighters must establish a decontamination lane to process responders, contaminated casualties, and contaminated, but uninjured persons.

Continual Response Operational Task

This operational task includes the following enabling and functional tasks, all of which may require the use of a USAF installation's follow-on assets: Site Management Operations (The OSC will assemble the functional areas upwind from the incident site, outside the contamination control line), Casualty Management (Medical Services will provide emergency medical response at the incident site, including lifesaving medical care and support for responders), Control the Incident Site (SF should maintain the incident site as a crime scene until relieved by the applicable investigative element [OSI or FBI]), Contain Contaminated Material (The primary objective is to ensure that the incident does not extend beyond the cordoned area), Implement Continued Shared Response (Each installation needs to have the knowledge and ability to contact and receive assistance from DoD specialized teams such as the WMD Civil Support Teams).

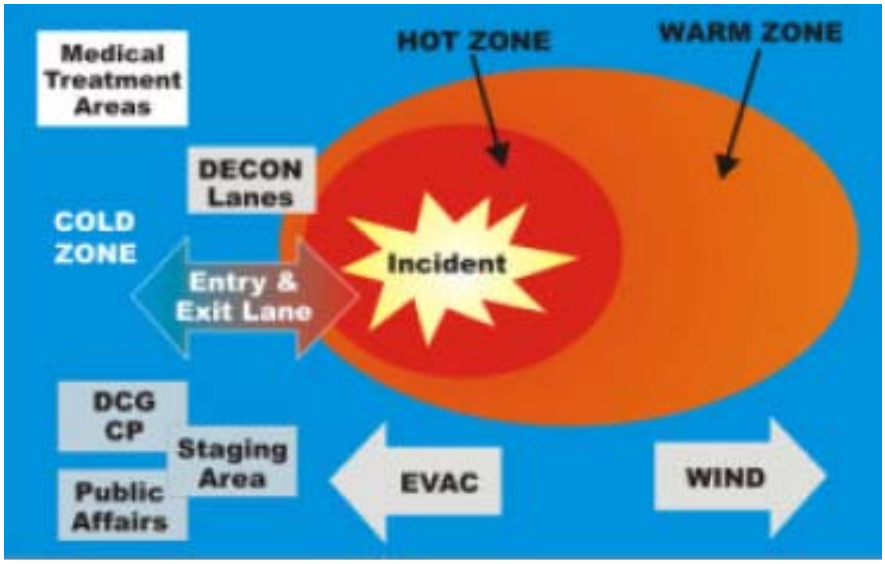


Figure 11-5

11. Emergency Management (EM) Operations

d. Given applicable references, describe facts about CBRNE attack actions with at least an 80% accuracy. STS: 11.2.2.1., 11.2.2.2., 11.2.2.3.

CBRNE ATTACK ACTIONS

This objective will cover facts about pre-attack, trans-attack and post attack actions for a CBRNE attack.

Pre-Attack

Contamination avoidance and protection actions occur in the pre-attack stage in order to reduce the likelihood of resources becoming contaminated during trans-attack. Fixed installations must set-up sectors and zones to ensure effective and timely protection and avoidance of contamination in preparation for an attack.

Trans-Attack

Trans-attack actions occur immediately before and during an enemy attack. Attacks can come from missiles, artillery, unmanned aerial vehicles, aircraft, terrorists or ground forces. Clearly designate alarm signals and MOPP levels. Enacting different alarm conditions and MOPP levels is critical and directly impacts the ability to survive and operate (ATSO).

Post-Attack

Post-attack recovery decisions should focus installation resources on lifesaving, preventing the further loss of combat power, maintaining or restoring base integrity and security, restoring command and control over forces, primary mission restoration, and support to other forces.

11. Emergency Management (EM) Operations

e. Given applicable references, analyze the steps necessary to execute CBRNE attack actions with at least an 80% accuracy. STS: 11.2.2.4.1., 11.2.2.4.2., 11.2.2.4.3.

EXECUTION OF CBRNE ATTACK ACTIONS

This objective will cover how to analyze the steps necessary to execute pre, trans and post CBRNE attack actions.

Pre-Attack Actions for Alarm Green – (Attack is Not Probable)

Update the current CBRNE threat intelligence information. Review current intelligence information every 12 hours (or as new information is available).

TBM attacks will likely include chemical or biological agents; therefore, conduct accurate and timely threat assessments to determine the appropriate alarm condition, MOPP level, and "last second" contamination avoidance actions.

Upon initial declaration, recall forces and activate the WOC, SRC, and unit control centers. Direct 24-hour operations for primary and alternate command and control functions. Follow-on priorities include recovery, mission sustainment, defense enhancements, and maintenance of existing capabilities.

Contact the theater or joint force agency responsible for air, ground, and missile attack warning and defense. Verify the procedures and timelines for how the airbase receives theater missile, aircraft, and ground forces attack warning and how the airbase reports attacks

Review airbase warning signals and alarm conditions. Provide visual aids and current information to each unit control centers, the base population, and all assigned, attached, coalition, and host-nation forces. Develop multilingual visual aids and public address systems announcements.

Develop command and control system procedures to rapidly receive notice of TBM launch, adjust mission focus, and disseminate warning to all base personnel.

Verify the operation and coverage of the base warning system. Verify the actual times required to notify the airbase population under each warning method (base siren, public address system, radio net, and telephone). Verify the warning system is able to provide attack warning and notification to 100 percent of the airbase population within 10 minutes.

Implement MOPP operations based upon the current threat. Notify the base populace and re-evaluate every 12 hours or when climatic conditions significantly change. Determine the need for MOPP options and direct when appropriate.

Implement the airbase zones or sector plan to support the movement of contaminated assets (people and equipment) between zones or sectors. Identify critical post attack recovery teams (EOD, airfield damage assessment, building damage assessment, CBRNE reconnaissance, and firefighter) and sector or zone crossing procedures to facilitate quick movement in support of post attack recovery operations.

If the previous alarm condition was Alarm Red or Black, re-evaluate the status of protective actions. Replenish material expended during contamination control or decontamination operations. Redistribute material, such as IPE and nerve agent antidotes, to support priority missions or units with high usage rates.

Review the probable CBRNE attack threat scenarios and actions with Security Forces, Civil Engineer Readiness, and intelligence personnel at each shift change. Review the status of planned and in-progress medical pretreatments.

Direct individuals to keep their canteens full at all times. Direct units to store potable water within unit work areas to support unit operations for a minimum of 24-hours without re-supply.

Develop and implement an airbase Ground Sector and CBRNE zone plan. Practice likely post-attack scenarios with command and control elements. Ensure unit control centers understand their responsibility to maintain control of their personnel when they enter or exit contaminated areas.

Evaluate airbase medical treatment capabilities based on the current threat and brief the commander and staff. Establish procedures for casualty collection. Identify casualty collection points (CCP) and notify each unit control center, the base population, and all assigned, attached, coalition, and host-nation forces.

Establish base mortuary procedures for processing contaminated and uncontaminated remains. Identify and staff the mortuary collection point. Identify and prepare sites for temporary interment of human remains.

Activate CBRNE specialized teams. Assign personnel where needed to bring teams up to 100 percent of required manning for 24-hour operations. Direct responsible units to verify team material is serviceable and operators are proficient. Conduct team drills and training to meet local proficiency standards.

Maintain watch for covert attack indications. Periodically remind personnel to remain observant for signs of a covert or suspicious activity.

Increase protection for food and water supplies. Direct units to store a 24-hour supply of Meals, Ready to Eat (MRE) within their unit area.

Develop or implement the airbase CCA plan. Identify primary and alternate CCA on-base locations. The CCA must be able to process the required percentage of the airbase population over a 24-hour period.

Implement the airbase protective shelter plan. Manage shelter operations through the SRC and CBRNE Defense Cell. Provide assistance to shelter management teams (SMT), especially those associated with collective protection facilities and transportable systems.

Implement the airbase protective hardening plan. Coordinate these plans to complement the airbase critical asset dispersal plan and contamination avoidance cover plan.

Implement a consolidated critical asset dispersal and CBRNE contamination control and cover actions. Use all available facility overhead cover, hardened facilities, revetments, and berms. Prioritize use of facility overhead cover for mission critical assets (aircraft, munitions, aerospace ground equipment, fire trucks, POL vehicles). .

Implement the airbase CBRNE detection plan. Include detection assets from all Air Force, joint service, host-nation, and coalition forces. Annotate base and unit maps to show CBRME Reconnaissance team routes.

Disperse and protect bulk stored or palletized IPE and CBRNE equipment from weather, contamination, abuse, and theft. Include equipment stored inside facilities or under cover. Double-wrap with plastic tarps and check for damage or contamination following attacks.

Contact the Joint Rear Area Coordinator to identify what security, medical, or CBRNE defense assistance is available from or provided to other rear area units.

Contact the coalition or host-nation forces CBRNE defense section and coordinate mutual support for contamination avoidance, protection, and decontamination.

Direct the CBRNE Cell to implement the Theater NBC Warning and Reporting System procedures. Identify CBRNE warning and reporting procedures and responsibilities for Air Force geographically separated units, joint service, coalition, and host-nation CBRNE defense units and forces.

Implement standing operating procedures to protect tactical aircraft, large-framed aircraft, and passengers. Ensure procedures include methods to notify aircrew and passengers of airbase alarm conditions and MOPP level prior to aircraft arrival, during aircraft taxi, and during ground transfer to and from the aircraft.

Ensure post-attack reconnaissance teams (base and unit level) develop procedures to clearly report UXO, casualties, building damage, and contamination. Procedures should be detailed enough to allow UCC and SRC personnel to differentiate between UXO and contamination reports and avoid prolonged MOPP 4 wear due to inadequate reporting and procedures.

Establish UXO holding areas for CBRNE munitions. Use prevailing wind data, base utilities, and knowledge about unit operating locations to select a suitable site, which will not affect, or have the least effect, on base operations or personnel.

Pre-Attack Actions (Alarm Yellow, Attack is Probable in less than 30 Minutes)

Implement MOPP based upon the threat. Consult with CE Readiness and Medical personnel to determine the appropriate MOPP, work-rest cycles, and hydration standards for the next 24-hour period. Notify the base populace. Determine the need for MOPP options and direct when appropriate. Based upon threat, direct personnel to wear the helmet and body armor in addition to the current MOPP.

If the current MOPP level is MOPP 0 or MOPP 1, then implement MOPP 2. If the current MOPP level is MOPP 3, MOPP 4, or the MASK ONLY option is in effect, remain in the current MOPP and remain masked unless directed otherwise. Ensure all personnel within the immediate area are in the correct MOPP level and know the current alarm condition.

Consider the mission priorities, threat, and warning timeline and direct appropriate actions. Identify critical tasks and missions to either continue or terminate. Terminate routine or non-critical operations. Direct units to implement the appropriate pre-planned actions from their Alarm Yellow checklists.

Trans-Attack Actions (Alarm Red, Attack by Air, Missile, or Ground Force is Imminent or In Progress)

The specific actions to take for Alarm Red depend upon the threat and the location of the individual or weapon system. Whenever possible, the WOC or SRC should supplement attack warning signals with detailed attack information. If available, provide the attack type (aircraft, missile, or ground force), expected attack location (building, sector, or zone), and time remaining until the attack begins.

Report observed attacks or enemy personnel movement to the unit control center or work center as soon as they occur. Armed individuals should defend themselves under the current Rules of Engagement and coordinate actions with other personnel within their areas.

Use Buddy Checks to verify proper IPE wear and assist other personnel with donning. If the position where a person is located becomes too dangerous to maintain, move to a

safer area. Assist injured personnel if possible. Otherwise, remain in the current position and under cover until provided further instructions.

Unless under direct attack or otherwise directed, WOC, SRC, and UCC personnel should complete their warning and notification actions before assuming protective actions or donning IPE. This enables rapid warning of the airbase population and takes advantage of the hardening protection provided to most command and control facilities.

The airbase Commander may direct mission essential activities to continue during Alarm Red. The importance of these missions should justify the increased risk to personnel and resources. Examples include mission continuation and sortie generation, aircraft launch or recovery, medical, EOD, fire fighting, or airbase defense operations.

Cover

1. Actions for Personnel In Open Areas: When the attack warning sounds (or notification is received) individuals in open areas should seek the best available protection (building, bunker). Ideally, this protection should be within 200 feet and provide overhead cover. If such protection is unavailable, move to a ditch, depression, or structure that provides protection from blast, fragments, and small arms fire. If no warning is received and an attack begins, drop to the ground, don the protective mask, crawl to closest available protection, and don the remaining IPE. Use any available material to provide overhead cover (rain gear, poncho, tarps, or plastic).

2. Vehicle and Equipment Operators and Passengers: When the attack warning sounds or notification is received, vehicle, equipment operators should drive to the best available protection (building, aircraft shelter, bunker, or hanger) while passengers don IPE. Ideally, protection should be within a one minute or less drive and provide overhead cover. Drive the vehicle, equipment into or under shelter if possible. Otherwise, stop (do not block roads or taxiways), leave keys in the ignition, and direct passengers to seek cover. All personnel don IPE. If such protection is unavailable, drive near a ditch, depression, or structure that provides protection from blast, fragments, and small arms fire. All personnel exit, take cover, and don IPE.

3. Actions for Personnel inside Structures, Shelters, and Tents: Hardened facilities include those facilities that are provided with hardened, semi-hardened, or splinter protection levels. Expeditionary and temporary shelters are prone to catastrophic structural failure from blast effects

4. Hardened Structures Equipped With Classes I through IV Collective Protection: Unless under attack by ground forces, personnel who are inside a hardened structure equipped with collective protection systems will assume the mask-only option until the attack is over, and the shelter

team verifies the over pressurization system is functioning. They do not need to take cover or wear field gear. Should a breach occur within an area provided with collective protection, personnel should assume (or remain in) MOPP 4 and follow instructions from the shelter management team. Controlled entry and exit procedures are in effect until the outside protective level is MOPP 2 or lower.

5. Hardened Structures without Collective Protection: Personnel who are within a hardened structure without collective protection will assume the mask-only option unless otherwise directed. They do not need to take cover or wear field gear unless under attack by ground forces. Should a breach occur, personnel should assume (or remain in) MOPP 4. When the outside MOPP level is MOPP 2 or below, remove the protective mask only after completing the detection and ventilation procedures.

6. Unhardened Structures with Classes I through IV Collective Protection: Personnel will take cover to avoid conventional weapons effects and assume MOPP 4. When the attack is over and the shelter team verifies the over pressurization system is functioning, personnel within these facilities should assume MOPP 2, or as directed. Should a breach occur within an area provided with collective protection, personnel should assume (or remain in) MOPP 4 and follow instructions from the shelter management team. Controlled entry and exit procedures are in effect until the outside protective level is MOPP 2 or lower.

7. Unhardened Structures without Collective Protection: Personnel will take cover to avoid conventional weapons effects and don their IPE. Personnel will assume the same MOPP level as directed for personnel outside. When approved by the airbase senior commander, personnel within these facilities may be allowed to reduce to mask-only protection when the attack is over. Controlled entry and exit procedures are in effect until the outside protective level is MOPP 2 or lower.

Post-Attack actions (Alarm Black, Attack is Over)

Continue to wear IPE according to MOPP declaration. Ensure all personnel are in the correct MOPP level and know the current alarm condition.

Remain under cover and check yourself and other individuals for evidence of contamination. If contamination is found, complete immediate decontamination with the M291 and M295 decontamination kit. Perform self-aid and buddy care as needed.

Conduct a physical check within your facility and a visual check of the outside areas for UXO, casualties, contamination, and facility or equipment damage. Report all positive findings to the UCC or work center. Stay in a protected position with overhead cover

unless you are in personal danger or must perform rescue or assist casualties that cannot move themselves to your position.

Base Civil Engineer CBRNE Reconnaissance and Damage Assessment teams begin surveys and report contamination, UXO, damage, fire, casualties, and other incidents as found.

Identify contamination hazards and direct split MOPP levels based for zones or sectors. The UCC controls post attack movement between zones or sectors. Restrict movement to mission essential tasks and identify sector or zone entry and exit control points.

When movement is required, identify conditions and procedures to regulate movement of contaminated personnel and equipment between clean and contaminated areas. Implement procedures for receiving and handling contaminated equipment moved into clean areas.

When directed by the WOC or other authority, begin unit PAR sweeps over pre-designated unit areas. Check pre-positioned M8 and M9 paper for signs of contamination and look for passive indicators such as dead or dying wildlife. Determine if sufficient uncontaminated assets remain to allow use of only these assets. If so, separate (and properly mark) contaminated assets from uncontaminated resources.

When directed to resume mission critical operations or tasks, continue to look for evidence of contamination and watch for hazard marking signs or indications. If contamination is found on vehicles or equipment, decontaminate the areas that must be touched or used to continue the mission. Concentrate on such areas as door handles, seats, steering wheels, operating controls, and ladder steps. Place plastic sheet over contaminated areas (even if decontaminated) where people will sit
When directed by the SRC, UCC, replace contaminated M8 and M9 paper and contaminated protective covers (plastic over vehicles and equipment for example). Properly dispose of all contaminated waste.

The UCCs and SRC will collect PAR information, determine the effect on operations, prioritize actions and recommend courses of action to the WOC and commander. The CBRNE Control Center will plot any contamination that is found, identify the type of agent, and determine potential hazard duration. The SRC staff will conduct MOPP analysis and recommend base-wide or CBRNE zone, sector alarm conditions and MOPP.

Structure Ventilation Procedures: When the outside contamination level allows operations without the protective mask, ventilate all structures and tents not equipped with Classes I through IV collective protection systems. Do not remove the protective mask until this procedure is completed or agent detectors indicate the area is safe. Ventilation procedures clear the airborne contamination that may have infiltrated the structure. Include tents, fighting positions, bunkers, and aircraft shelters. Turn ventilation systems on (if equipped) and operate in the fresh air or exhaust mode. Open

doors and windows to speed the removal of residual contamination. After 30 minutes, test with available detectors to determine if hazards remain.

If an airbase obtains positive indications of a CBRNE attack and the attack is the first verified use within the theater, the airbase commander will immediately transmit an NBC 1 report by FLASH precedence up the reporting chain. The CBRNE Control Center will issue NBC reports for subsequent attacks and provide more detailed information when required. Whenever possible, obtain samples of suspected NBC contamination for transfer to established laboratories for analysis and confirmation.

11. Emergency Management (EM) Operations

f. Given applicable references, describe facts about natural disasters with at least an 80% accuracy. STS: 11.2.3.1., 11.2.3.2., 11.2.3.3.

NATURAL DISASTERS

This objective will cover: Policies and shelter concepts, types and hazards and the peacetime alert warning system.

Policies and Shelter Concepts

Policies

Installations use the DRF when responding to natural disaster events. MAJCOMs, FOAs and DRUs will deploy their DSG to support their installations affected by natural disasters, when needed. If the effects of an incident on an installation extends to surrounding civilian communities – or when the need to save lives, prevent human suffering or mitigate great property damage is a concern – the installation may respond immediately and report the incident as soon as possible.

Sheltering

All installations must have a plan to ensure the shelter space for peak on-base population in case a natural disaster occurs. Natural disaster shelters are selected based on their structural and personnel housing capabilities in relation to the type of disaster(s) likely to occur in the area. Refer to AFMAN 32-4005 for information concerning the installation shelter program.

Hurricanes

Hurricanes begin as a low pressure storm cell known as tropical depressions. When conditions are right, the storm strengthens until it becomes a hurricane. The term "hurricane" is used when winds reach constant speeds of 74 miles per hour or more. The term "hurricane" applies primarily to the Atlantic Ocean. In the Pacific region these storms are generally referred to as "typhoons".

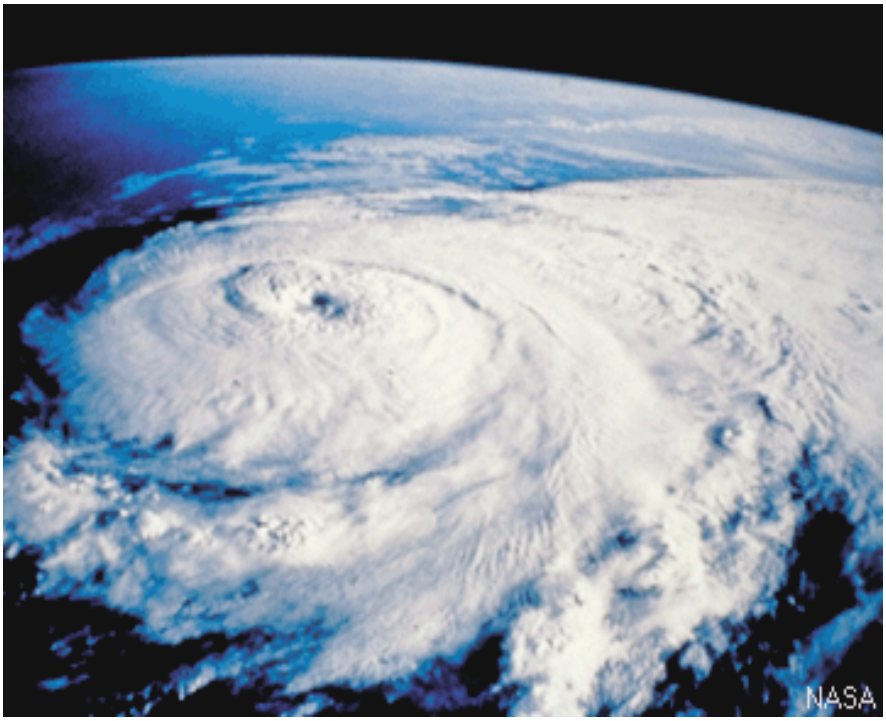


Figure 11-6

Frequency of Hurricanes

Hurricanes are a fairly frequent occurrence in the eastern United States. On the average, six Atlantic hurricanes occur per year (not all make "landfall"). The six month period from 1 June to 30 November is considered to be hurricane season.

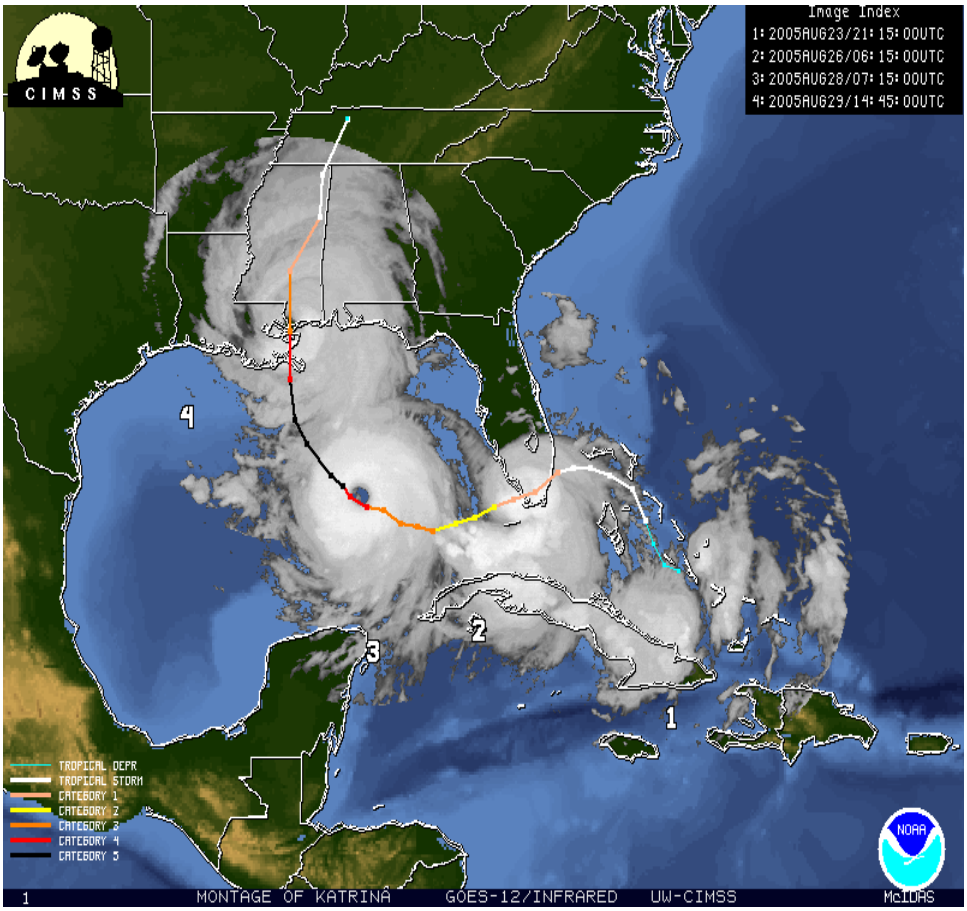


Figure 11-7

Immediate Dangers of Hurricanes
Some immediate dangers of hurricanes are:

- Extremely high winds can demolish houses, uproot trees, collapse bridges, and hurl large amounts of debris.
- Tornadoes can develop as the hurricane passes.
- Massive wall of water, many times higher than the normal tide comes rushing in with the hurricane and can destroy property along the coast line.
- This 10 to 40 foot wall of water is called a “storm surge”.

Figure 11-8

Figure 11-9

Long Term Dangers of Hurricanes
Some long term dangers of hurricanes are:

- Fires and explosions from gas leaks
- Interrupted gas and power
- Fallen power lines
- Electrical short circuits
- Contaminated food and water

Preparing for Hurricanes
Some steps in preparing for hurricanes are to:

- Check your window shutters and supply of boards, tools, batteries, and non-perishable foods
- Protect windows.
- Secure outdoor objects.
- Store drinking water.
- Keep your car's gas tank filled.

Response To Hurricanes
Some response steps for hurricanes are:

- Evacuate the area.
- Evacuate mobile homes
- Leave low-lying areas.
- Stay indoors away from windows.

- Do not attempt to travel by car or foot once the storm has reached your area.
- Don't be fooled into thinking the hurricane has passed while the eye is over your area; many people lose their lives by making this mistake.
- When the winds begin again, they will grow rapidly to hurricane force, AND COME FROM THE OPPOSITE DIRECTION.

Figure 11-10

Tornados

Tornados are composed of violently rotating columns of air that descend in a funnel shape from thunderstorm cloud systems. To be called a tornado, the "funnel" must come in contact with the ground. Wind speeds in the funnel can approach over 300 miles per hour within the tornado's center. The destruction path associated with a tornado averages about 250 yards in width and 15 miles in length. Tornadoes usually travel from a westerly to an easterly direction. However, this pattern doesn't apply to tornadoes spawned by hurricanes.

Figure 11-11

Frequency of Tornados
Hundreds of tornadoes occur in the United States each year. They can occur anywhere during anytime of the year. However, the Great Plains and gulf coast states experience the greatest number of tornadoes. The greatest frequency of tornados occurs in the months of April, May, and June.

Immediate Dangers of Tornados
Some immediate dangers of tornados are:

- Violently whirling winds and debris hurled through the air by the winds
- Down Power lines
- Block or impassable roads

Long Term Dangers of Tornados
Some long term dangers associated with tornados are:

- Possibility of building collapse
- Fallen trees and power lines
- Broken gas lines
- Broken sewer and water mains
- Outbreak of fire

Figure 11-12

Figure 11-13

Preparing for Tornados
Some steps in preparing for tornados are:

- Designate a safe place in or around your home as a tornado shelter.
- A storm cellar or basement offers the best protection.
- If these aren't available, find shelter under heavy furniture or mattresses near an inside wall of your house.

Response Steps for Tornados
Some response steps for tornados are:

- When notified or you become aware of the danger, immediately go to your Pre-planned shelter area.
- Do not position yourself directly underneath heavy appliances on the floor above you.
- Do not stay in a trailer or mobile home if a tornado is approaching.
- Go to a designated shelter or to a nearby ditch or ravine.
- If you are driving and spot a tornado in a city, get out of your car and go into a nearby building.
- If you are driving and spot a tornado in the open country, drive at right angles to the tornado's path if you can safely do so. Don't try to outrun the tornado.
- If caught in the open, lie flat in the nearest depression.

Thunderstorms

Thunderstorms are violently developed as masses of warm air rises. Storm clouds develop during these conditions and bring with them strong winds, lightning, hail, and rain. Every thunderstorm produces lightning.

Figure 11-14

Frequency of Thunderstorms
At any given moment, nearly 2,000 thunderstorms are in progress over the earth's surface. There are an estimated 100,000 thunderstorms in the U.S. annually.

Immediate Dangers of Thunderstorms
Some immediate dangers of thunderstorms are:

- Lightning presents the greatest immediate danger of a thunderstorm. Each year lightning kills over 80 Americans and injures more than 300.

Figure 11-15

Long Term Dangers Associated with Thunderstorms
Some long term dangers associated with thunderstorms are:

- Extensive agricultural damage
- Leads to Flooding

Preparing for Thunderstorms
Some steps in preparing for thunderstorms are:

- Designate a safe area in your home to shelter your family in a severe thunderstorm.
- Stock your shelter with candles or flashlights and a battery powered radio

Response Steps for Thunderstorms
Some response steps for thunderstorms are:

- Get away from bodies of water.
- Get away from tractors and all farm equipment
- Avoid other “lightning rods” such as golf clubs, fishing rods, and bicycles.
- Stay away from the tallest object in the area.

Winter Storms

There are three categories of winter storms:

- “Blizzard” is the most dangerous of all winter storms.
- “Heavy snow storm” is one which drops 4 or more inches of snow in a 12-hour period, or 6 or more inches in a 24-hour period.
- An “ice storm” occurs when moisture falls from clouds and freezes immediately upon impact.

Figure 11-16

Immediate Dangers of Winter Storms and Blizzards:

Some immediate dangers of winter storms and blizzards are:

- Heavy snowfall and blizzards can trap motorists in their cars, cause traffic accidents, and trap people in their homes.
- Ice storms can break power lines with resulting widespread blackouts
- Fires during winter storms present greater dangers because water supplies may freeze and fire fighting equipment may not be able to reach the fire
- Physical overexertion leads to strokes and heart attacks.

Long Term Dangers of Winter Storms and Blizzards are:

Some long term dangers of winter storms and blizzards are:

- Increased possibility of utility failures

- Interruption of services (gas/utilities); this leads to extreme hardship and some deaths from extended exposure to the cold temperatures.

Preparing for Winter Storms and Blizzards

Some Steps in preparing for winter storms and blizzards:

- Be prepared for isolation at home.
- Have some kind of emergency heating equipment and fuel available in case of power failures.
- Stock an emergency supply of food and water, as well as emergency cooking equipment such as a camp stove.
- Have battery-powered radios and extra batteries on hand. Keep flashlights, lanterns, simple tools, and fire fighting devices.
- Be sure family members know how to use the emergency heating and lighting equipment safely.

Responding to Winter Storms and Blizzards are:

Some steps in responding to winter storms and blizzards are:

- Avoid all unnecessary trips.
- Moderate physical activity.
- Wear several layers of loose-fitting, lightweight, protective clothing
- Stay in your car and wait for help.

Earthquakes

An earthquake is a wave-like movement of the earth's surface. A quake can also be produced by volcanic eruptions.

Damage caused by a fault trace during the 1987 Edgecumbe earthquake

Figure 11-17

Immediate Dangers Associated with Earthquakes

Some immediate dangers associated with earthquakes are:

- Partial or total building collapse including chimneys and walls, falling ceiling plaster, light fixtures, and pictures
- Flying glass from broken windows and skylights
- Bookcases, fixtures and other large furniture and appliances
- Fires from broken chimneys and broken gas lines

Figure 11-18 Figure 11-19

Long Term Dangers of Earthquakes
Some long term dangers of earthquakes are:

- Weakened building structures, utility lines, bridges, or dams
- Contaminated water supplies (by seepage around water mains)
- Resource (food, medical supplies, heating fuel, etc) shortages because of damage to transportation routes

Preparing for Earthquakes
Some steps in preparing for earthquakes are:

- Secure items, use flexible connections
- Place large and heavy objects on lower shelves
- Teach responsible members of your family to turn off gas, electricity, and water at main switches

Response Steps for Earthquakes
Some response steps for earthquakes are:

- Remain calm and stay where you are.
    - Indoors: get against an inside wall, stand inside a doorway, or get under a sturdy piece of furniture.
    - Outside: move to an open area.
    - If at home, turn off the utilities.
    - If in a car, stop and stay in the vehicle. Avoid bridges, underpasses, and tall buildings.
- After the earthquake, check your utilities before use.

- Don’t eat or drink anything from open containers near shattered glass.
- Immediately clean up harmful items.
- Don’t use your phone except for genuine emergency calls.
- Be prepared for additional earthquake shocks (called aftershocks).
- Stay away from and out of severely damaged buildings. Aftershocks can shake them down.

Floods

Floods are one of the most common hazards in the U.S. However, all floods are not alike. Some floods develop slowly, sometimes over a period of days; however flash floods can develop quickly, sometimes in just a few minutes, and without any visible signs of rain. Floods can be seasonal, as when winter or spring rains and melting snow drain down stream beds and fill river basis with too much water too quickly. Flash floods are usually the result of extremely heavy rain or snow and are sudden.

Figure 11-20

Frequency of Floods

Hundreds of floods occur each year in the United States. No area in the U.S. is completely free from the threat of floods.

Immediate Dangers from Floods

Some immediate dangers from floods are:

- The strength of the water current and debris.

- Slow developing floods interrupt power, disable heat sources, and make roads impassable.
- The flood waters will cause poisonous reptiles and insects to share the “dry ground” with people.

Long Term Dangers Associated with Floods
Some long term dangers associated with floods are:

- Outbreak of disease
- Widespread animal death
- Broken sewage lines and widespread water supply pollution
- Extended periods of time without utilities

Preparing for Floods
Some steps in preparing for floods are:

- Stockpile emergency building materials such as sandbags, plywood, plastic sheeting, and lumber
- Keep your car fueled. If electric power is disrupted, pumps may be out of order for several days
- Make family evacuation plans. If you’re in a flash flood area, have several alternate routes.
- Maintain emergency supplies such as first aid kits, canned food, water in jugs/bottles/pans, portable radio, flashlights, and emergency cooking equipment.

Response to Floods
Some steps in response to floods are:

- Don’t attempt to drive over a flooded road.
- Move to high ground (flash floods).
- If the flood waters are rising slowly: Secure all outdoor items or store them inside on upper levels; move all valuable household possessions to upper levels; move cars, machinery, and all livestock to higher ground; check emergency food and water supplies.
- Don’t attempt to cross a flowing stream where water is above your knees.

Volcano’s

A volcano is a vent through which molten rock escapes to the earth’s surface. When pressure from gases within the molten rock becomes too great, an eruption occurs. Some eruptions are relatively quiet, producing lava flows that creep across the land at 2-10 mph. Explosive eruptions can shoot columns of gases and rock fragments tens of miles into the atmosphere, spreading ash hundreds of miles downwind. Lateral blasts

can flatten trees for miles. Hot, sometimes poisonous, gases may flow down the sides of the volcano.

Figure 11-21

Frequency of Volcanic Eruptions
The chance of eruptions that could damage populated areas in the U.S. is greatest in Hawaii and Alaska. The May 18, 1980 eruption of Mount St. Helens in Washington took the lives of 58 people and caused property damage in excess of $1.2 billion. The immediate danger area around a volcano is approximately a 20 mile radius. Associated dangers may extend 100 miles or more from the volcano.

Immediate Dangers Associated with Volcanoes
Some immediate dangers associated with volcanoes are:

- Lava flows, falling rocks, earthquakes, mudflows, and flash floods

Long Term Dangers Associated with Volcanoes
Some long term dangers associated with volcanoes are:

- Secondary eruptions and lava flows can occur days, weeks, or months after a
- Volcanic eruption
- Power failures as a result of increased electricity requirements (because the ash will darken the sky as if it were nightfall)
- The “ash” is actually pulverized rock. A one-inch layer weighs 10 pounds per

square foot. The weight can cause roofs to collapse. The ash can clog waterways, reservoirs, and machinery

Preparing for Volcanic Eruptions

Some steps in preparing for volcanic eruptions are:

- If a heavy ash fall is predicted: Close all windows, doors, and dampers in your home; put all machinery inside a garage or barn; bring animals and livestock into closed shelters.
- Have emergency lighting and heating supplies available

Responding to Volcanic Eruptions

Some steps for responding to volcanic eruptions are:

- Avoid stream beds and valleys in the vicinity of a volcano.
- Run uphill to avoid a flash flood, lava flow, or mudflow.

Tsunamis

Tsunamis, also known as seismic sea waves, are a series of enormous waves creates by an underwater disturbance such as an earthquake. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves as high as 100 feet or more, although most waves are less than 18 feet high. From the area where the tsunami originates, waves travel outward in all directions much like the ripples caused by throwing a rock into a pond.

Figure 11-22

Frequency of Tsunamis

Over 200 Tsunamis were recorded last century. A tsunami can strike anywhere along most of the U.S. coastline. Most Tsunamis occur in the Pacific Ocean. The most destructive tsunamis have occurred along the coasts of California, Oregon, Washington, Alaska, and Hawaii

Immediate Dangers of Tsunamis
Some immediate dangers of tsunamis are:

- Drowning
- Flooding
- Widespread property damage

Long Term Dangers Associated with Tsunamis
Some long term dangers associated with tsunamis are:

- Broken sewage lines
- Polluted water supplies
- Damaged gas lines
- Downed power lines

Figure 11-23

Figure 11-24

Preparing for Tsunamis
Some steps in preparing for Tsunamis are:

- Plan several escape routes to inland ground.

- Be prepared to evacuate low-lying coastal areas immediately

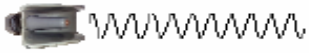
Responding to Tsunami's
Some steps used in responding to Tsunamis are:

- Upon hearing an official Tsunami warning, move inland to higher ground as quickly as possible
- Since a Tsunami is not a single wave but a series of waves, stay out of dangerous areas until an "all clear" is issued by an authorized source

Peacetime Alert Warning System

The peacetime alerting signal is the 3 to 5 minute steady tone. This tone is used by both military and civilians to warn people of natural disaster situations. When you hear the signal, start monitoring your TV/radio for emergency announcements. It's also a good idea to listen for sound trucks making their way through local neighborhoods. The "ALL CLEAR" is verbally given; there are no visual signals or sirens. All clear is generally transmitted by TV, radio, PA systems and word of mouth.

U.S. AIR FORCE EMERGENCY NOTIFICATION SIGNALS

CONDITION	IF YOU HEAR	THIS INDICATES	INDIVIDUAL ACTIONS
DISASTER WARNING[1,3]	3-5 MINUTE STEADY TONE ON SIREN OR SIMILAR WARNING DEVICE OR VOICE ANNOUNCEMENT	A DISASTER/INCIDENT AFFECTING THE BASE IS IMMINENT OR IN PROGRESS EXAMPLES: Tornadoes; Flash Floods; Hazardous Material Releases; Wildfires	- BE ALERT, ENSURE ALL PERSONNEL ARE WARNED - FOLLOW INSTRUCTIONS TO TAKE COVER, EVACUATE TO A SAFE LOCATION, OR SHELTER IN-PLACE
ATTACK WARNING[1,2,3]	3-5 MINUTE WAVERING TONE ON SIREN OR SIMILAR WARNING DEVICE  OR VOICE ANNOUNCEMENT	AN ATTACK/HOSTILE ACT IS IMMINENT OR IN PROGRESS EXAMPLES: Vehicle Bomb; Terrorist Release of Chemical, Biological, Radioactive Material	- BE ALERT, ENSURE ALL PERSONNEL ARE WARNED - IMPLEMENT SECURITY MEASURES, AS APPROPRIATE - FOLLOW INSTRUCTIONS TO TAKE COVER, EVACUATE TO A SAFE LOCATION, OR SHELTER IN-PLACE
ALL CLEAR	VOICE ANNOUNCEMENT	THE IMMEDIATE DISASTER THREAT HAS ENDED OR THE ATTACK IS OVER	- REMAIN ALERT FOR SECONDARY HAZARDS - ACCOUNT FOR ALL PERSONNEL - REPORT FIRES, INJURIES, AND HAZARDS

LOCAL PROCEDURES:

NOTES:
1. See AFI 10-2501 and AFMAN 10-2602 for further guidance on warning systems and protective actions.
2. During wartime or combat operations, AFVA 10-2511, *USAF Standardized Attack Warning Signals for NBCC Medium and High Threat Areas*, will be used to initiate passive defense actions in accordance with AFMAN 10-2602 or as directed by the installation commander.
3. Monitor commanders channel or local media for information regarding specific actions for military personnel

Prescribed by AFI 10-2501
Supersedes AFVA 32-4010, 1 November 1997
Distribution: F

AFVA 10-2510
1 Nov 03

Figure 11-25

11. Emergency Management (EM) Operations

g. Given applicable references, describe facts about natural disasters phases of response with at least an 80% accuracy. STS: 11.2.3.4.1., 11.2.3.4.2., 11.2.3.4.3., 11.2.3.4.4.

NATURAL DISASTER PHASES OF RESPONSE

The four phases of response for a natural disaster are notification, initial emergency, sustained emergency and recovery. The notification phase consists of actions taken in anticipation of a natural disaster. Commanders may not be able to execute these actions if a natural disaster occurs with little or no warning. The initial emergency phase consists of actions taken during, or immediately following, a natural disaster. The sustained emergency phase consists of actions taken after the appropriate initial emergency actions are completed. The recovery phase occurs after sustained emergency actions have been implemented and lifesaving actions have been completed. This phase can be a very lengthy process—sometimes months or years.

Notification Phase

Some actions associated with the notification phase are: Establishing command and control; Notifying the DRF, base agencies, and the base populace; Protecting facilities and material from the effects of natural disasters; Considering sheltering, dispersing, or evacuating people and critical materiel; Isolating or shutting off utilities

Providing periodic situation updates to the base population; Coordinating with civil authorities on notification and assistance; Beginning data collection on all actions for the final lessons learned report.

Initial Response Phase

Some actions associated with the initial response phase after a natural disaster are: Assessing casualties, damage to facilities, utilities, material, and the mission impact; Clearing routes to aid fire fighting and search and rescue; Fighting fires based on facility priorities; Conducting search and rescue; Establishing a facility to register and care for displaced persons, serve as an inquiry point, and reunite separated family members

Caring for casualties and implementing preventive medical procedures; Recovering, identifying, and disposing of human remains; Cordoning or eliminating hazards created by the natural disaster; Restoring critical utilities, facilities, and information systems.

Sustained Emergency Phase

Some actions associated with the sustainment emergency phase are: Reestablish primary mission capability; Reassess the situation; Implement the BCE contingency response plan and restore communication-computer systems; Keep the base populace informed of the situation; Salvage, protect, and distribute food and water stocks; Assess water source potability

Implement sanitation control procedures; Establish more definitive medical treatment; Establish financial services; Initiate detailed damage assessment; Continue collecting data for the final lessons learned report.

Recovery Phase

Some actions associated with the recovery phase are: Reestablish total mission capability; Develop a plan covering short- and long-term recovery requirements; Prepare to handle large numbers of personnel and claims actions; Return to normal operations; Finalize all reporting requirements.

11. Emergency Management (EM) Operations

h. Given applicable references, describe facts about the principles of notification for major accident with at least an 80% accuracy. STS: 11.2.4.5.1.1., 11.2.4.5.1.2., 11.2.4.5.1.3.

PRINCIPLES OF NOTIFICATION FOR MAJOR ACCIDENTS

This objective will cover the principles of notification for Installation; Federal, state and local and Host nation major accident response.

Principles of Notification for Installations

The notification phase typically begins when installation authorities receive notification of an actual or potential major accident. Evacuation is started, the DRF is alerted, and higher headquarters and local civil authorities are notified.

There are many ways that an installation can be notified of major accidents. One way would be an eye-witness to the accident either calling the 9-1-1 Emergency Notification System, or by calling the installation directly through the Command Post. Once the

message gets to the installation, base agencies are notified by giant voice, Primary crash/Secondary crash net, or if the agency is not on either crash net, using the pyramid recall system.

Higher Headquarters/MAJCOM
Higher Headquarters also will need to be aware of the situation so as to not be surprised or caught off guard by any news media that might get the story. Higher Headquarters will be notified of the major accident by either an OPREP-3 report or a SITREP. The installation Command Post is the OPR for the reports. The MAJCOM will, in turn, notify the Air Force Operations Support (AFOSC), and the National Military Command Center (NMCC).

Principles of Notification for Federal, State and Local

The command post notifies local civil authorities if the accident is off base and may present a hazard to the civilian community. If necessary, local civil agencies as well as radio and television stations are contacted for support. Also, the command post notifies affected federal installation and facilities. If hazardous materials are present that exceeds the reportable quantity the Local Emergency Planning Committee (LEPC) and the State Emergency Response Commission (SERC) must be notified by phone and with a written follow-up.

Principles of Notification for Host Nation

Civil jurisdiction within foreign countries is delineated by MAJCOM, theater and DoD guidance.

11. Emergency Management (EM) Operations

i. Given applicable references, describe facts about the phases of response for a major accident with at least an 80% accuracy. STS: 11.2.4.5.2.1., 11.2.4.5.2.2., 11.2.4.5.2.3., 11.2.4.5.2.5.

PHASES OF RESPONSE FOR MAJOR ACCIDENTS

This objective will cover major accident phases of response to include the response, withdrawal and recovery phases. It will also cover how to provide inputs to required reports.

Response Phase

In the response phase of a major accident, the DRF elements deploy to the accident scene and establish command and control. Deployment procedure depends on the accident location. The initial response element (IRE) consisting of fire protection, security and medical goes directly to the accident site if it is on the installation or close enough to: Start command and control or Perform lifesaving, rescue, suppression, and containment.

The fire chief designates the ECP and acts as the OSC. The follow on elements (FOE) deploy promptly to the scene when directed by the OSC to provide enhanced command, control, and communications. If the incident is too far away to perform timely lifesaving, rescue, etc., the civil authorities nearest the accident usually provide these services.

The DRF should initiate these actions upon arrival:

- Approach from upwind or crosswind.
- Rescue, fire fighting and medical procedures.
- Organize the response elements at the scene.
- Assess damage, casualties and hazards.
- Determine if a NDA is needed to protect DOD resources. (In foreign countries, request a security area be established for security of classified and protection of the public).
- Coordinate with local civil authorities if areas under civil jurisdiction are affected by the accident
- Establish a cordon (continually reassess the cordon size)
- Accomplish evacuation as necessary. Civilian authorities are responsible for evacuation within their jurisdiction.
- Establish an OSCP and ECP
- Identify and contain hazards
- Initiate contamination control if necessary.
- Establish an operations area and a base camp
- Document the names of civilian and military people who were at the accident site
- Release information to the public

Withdrawal Phase

In the withdrawal phase, response forces must leave the accident site if they're in imminent danger or when all emergency response actions are completed. The senior firefighter at the accident site declares withdrawal and advises the OSC of the action. The DRF should use all available communication methods to signal or announce emergency withdrawal. Forces inside the accident cordon must proceed as quickly as

possible to the disaster cordon. No one may return to the accident site after withdrawal until authorized by the OSC.

In the recovery phase we need obtain all information about the incident as possible, and develop and carry out a recovery plan. The OSC has primary responsibility to approve all recovery actions. The OSC must ensure personnel are informed of hazards and properly equipped. Site access authority and wreckage custody may be transferred to the SIB/AIB president by the OSC. With OSC approval supporting DCG assets can be used for follow-on investigations.

Recovery Phase

Some specific activities accomplished during the recovery phase are: Determine presence, number, condition, location, etc. of casualties, classified material, explosives, weapons, contamination, and other hazards and Obtain missing information by all appropriate means including witness interviews, inventories and reconnaissance.

Providing Inputs to Required Reports

Commanders are responsible for timely and accurate reporting for all events/incidents that meet CJCS reporting criteria, CSAF reporting criteria, and MAJCOM/CC reporting criteria for all assigned or attached units, as well as units staging through their command. Let's take a look at some of the reports that the Readiness Flight will prepare or have an input to.

- The After-Actions Lessons Learned report consolidates information on all US Air Force installations response to any emergency response operation on or off the installation.

- Command post is responsible for OPREP-3 reports, but the Readiness Flight may have input into them. OPREP-3 reports use command and control channels to notify commanders immediately of any event or incident that may attract international, national, US Air Force, or significant news media interest.

- The PINNACLE (OPREP-3P) message is used by any unit to provide the NMCC and, as appropriate, combatant commands and Services with immediate notification of any incident or event where national-level interest is indicated. The general OPREP-3P report is used for situations that do not require reporting via other OPREP-3P reports.

- PINNACLE NUCFLASH (OPREP-3PNF) is used to report an event, accident, or incident that could create the risk of a nuclear war. This message has the highest precedence in the OPREP-3 reporting structure.

- PINNACLE FRONT BURNER (OPREP-3PFB) messages are used to report pre-conflict occurrence of armed attack, harassment, or hostile action against US forces, territory, or interests.

- PINNACLE BROKEN ARROW (OPREP-3PBA) messages are used to report a US nuclear weapon accident that does not create the risk of a nuclear war.

- PINNACLE EMPTY QUIVER (OPREP-3PEQ) messages are used to report the seizure, theft, or loss of a nuclear weapon.

- PINNACLE EMERGENCY DISABLEMENT (OPREP-3PED) messages are used for reporting operations involving the command disablement or nonviolent disablement of nuclear weapons.

- PINNACLE EMERGENCY EVACUATION (OPREP-3PEV) messages are used to report operations involving the emergency evacuation of nuclear weapons.

- BENT SPEAR (OPREP-3BS) messages are used to report incidents involving nuclear weapons that are of significant interest, but are not categorized as PINNACLE NUCFLASH or PINNACLE

- FADED GIANT (OPREP-3FG) messages are used to report nuclear reactor or radiological accidents or incidents to the appropriate Service headquarters.

- BEELINE (OPREP-3B) messages are used to report any event or incident that requires Air Force-level interest, but not requiring OPREP-3 PINNACLE reports.

- HOMELINE (OPREP-3H) messages are used to report events or incidents, which do not meet Air Force-level criteria, but are of interest to the MAJCOM.

- SITREP (Situation Report) Reports are completed by the command post, but the Readiness Flight may make inputs to the report. Commanders use SITREP reports to inform of significant situations; advise the status of ongoing military, political, or operational situations; advise of critical national or international situations.

- Commanders may require daily activity reports of all the organizations responding to the emergency or disaster.

11. Emergency Management (EM) Operations

j. Given applicable references, describe facts about nuclear weapon accident with at least an 80% accuracy. STS: 11.2.5.1., 11.2.5.2.

NUCLEAR WEAPONS ACCIDENTS

This objective will cover: Types and characteristics of radiological and nuclear hazards and hazards of radiological and nuclear accidents.

Types and Characteristics of Radiological and Nuclear Hazards

General Terms

There are some general terms that need to be reviewed prior to learning about radioactive hazards. Let's cover some terms:

- Radioactivity: The spontaneous emission of radiation, generally alpha or beta particles, often accompanied by gamma rays, from the nuclei of an unstable isotope. As a result of this emission, the radioactive isotope is converted (decays) into the isotope of another element which may or may not be radioactive. Ultimately, as a result of one or more stages of radioactive decay, a stable (non radioactive) end product is formed.
- Nuclear Radiation: Particulate and electromagnetic radiation emitted from atomic nuclei in various nuclear processes. The nuclear radiation types we're concerned with are alpha and beta particles, gamma rays, and neutrons. All nuclear radiations are ionizing radiations.
- Ionization: The separation of an electron from a normally electrically neutral atom or molecule forming electrically charged components. For our purposes, ionization refers especially to the removal of an electron (negative charge) from the atom or molecule.
- Proton: A unit or particle of electromagnetic radiation carrying an amount of energy which is characteristic of the particular radiation.
- Photoelectric Effect: The process whereby a gamma ray photon, with energy somewhat greater than that of the binding energy of an electron in an atom, transfers all its energy to the electron, which is consequently removed from the atom.
- Absorption: Transfer of energy by the radiation to an absorbing material through which it passes. The end result is that the material stops the radiation or reduces it's intensity by a given degree.

- Attenuation: Decrease in intensity of a signal, beam, or wave as a result of absorption and scattering. Basic process associated with radioactivity's interaction with non radioactive substances is:

    - The radioactive particle emits it's energy or photon
    - The photon strikes an electron of another atom
    - The electron leaves the orbit of its parent atom and heads off as an unstable entity (attempting to balance itself in the nucleus of another atom)
    - The parent atom is now unstable (positively charged) and attempts to balance itself by stealing the electron from another atom
    - The end result is called secondary ionization

Harmful Effects of Radiation on the Body

The ionization and excitation produced in living tissue cells causes some of the cell particles to be altered or destroyed. Some of the altered or destroyed portions are essential to the normal functioning of the cell. In addition, the by products may act as poisons. Some of the known consequences of the action of ionizing radiation on cells are:

- Breaking of the chromosomes
- Swelling of the nucleus and of the entire cell
- Increase in thickness of the cell fluid
- Increased permeability of the cell membrane
- Process of cell division (mitosis) is delayed or prevented
- Without mitosis, the normal cell replacement process that occurs in living organisms is inhibited
- Radiation can have a genetic effect. The radiation produces changes or mutations in the hereditary components (genes) of the reproduction cells of the sex organs
- A mutant gene causes changes in the next generation which may or may not be apparent

Primary Types of Radiation

1. Alpha particles
2. Beta particles
3. Gamma rays
4. Neutrons

- Alpha
  Alpha radiation is actually a particle. It is identical to the nucleus of a helium atom (4 mass units) and has double positive charge. These particles will travel two to three centimeters from its source

and can be stopped by paper, a thin layer of dust, any coating of water, or clothing. The primary factor behind the alpha particles short range is its absolutely dense ionization path. These particles won't penetrate the skin but if they are inhaled, ingested, or introduced to the body through open wounds, they can present a significant personnel hazard. Alpha particles are our primary concern in a nuclear weapons accident. You'll be using radiological detection instruments that measure alpha radiation in "counts per minute".

- Beta
  Beta radiation is also composed of particles. Physically, the beta particle is identical to an electron moving at high velocity. The beta particle has a negative charge Beta can travel up to 10 feet in the open air although the "net" range is less, because the particles are continually deflected by electrons along their path. The net range for beta particles is generally considered to be approximately 18-24 inches. Beta emissions can be stopped by a sheet of aluminum/metal. There isn't a radiological unit of measurement that applies strictly to beta radiation. The primary instruments you'll be using can "detect" beta but can't measure it.

- Gamma
  Gamma rays are electromagnetic radiations of high energy. They are identical to X-rays; the only difference being that X-rays don't originate from atomic nuclei. These rays can travel great distances through the air and can penetrate a considerable thickness of material. For example, at a distance of one mile from a large nuclear explosion, gamma rays released immediately upon detonation would prove fatal to a large proportion of exposed people even if they were surrounded by 24 inches of concrete. In short, nothing stops gamma dead in its tracks. Very dense materials such as lead or depleted uranium slow it down but nothing is impenetrable. The gamma threat is compounded by the fact the human senses don't detect gamma radiation except at very high intensities, when itching and tingling of the skin are experienced.

- We use the term "centigrays" (cGy) to measure gamma radiation. Our instruments still show "roentgens" or "milliroentgens".
- 1 roentgen equals 1 centigray
- 1 milliroentgen equals 1/1000th of a centigray

- Neutrons
  Neutrons are neutral particles. They are required to initiate the fission process (splitting of atoms). Large numbers of neutrons are

produced by both fission and fusion (combining of atoms) reactions. The effects of neutron radiation on the body are similar to that of gamma radiation. There isn't a unique unit of measurement for neutron radiation.

Hazards of Radiological and Nuclear Accidents

Primary Radioactive Hazards:

- Plutonium (Pu)
  Plutonium is a heavy metal with a shiny appearance similar to stainless steel when freshly machined. After exposure to the atmosphere for a short period of time, it will oxidize to a dark brown or black appearance. Five plutonium isotopes or daughter products you may encounter with a nuclear weapon containing plutonium.

  Pu 239 (alpha emitter)
  Pu 240 (alpha)
  Pu 241 (beta emitter)
  Pu 242 (alpha)

  When dispersed in an accident, plutonium is considered the most significant radiological hazard. The primary hazard results from inhalation and later deposition in the lungs. From the lung, plutonium enters the bloodstream and is deposited in the bone and. Bone deposition may lead to bone diseases many years later. Due to its extremely long physical and biological half-lives, plutonium is held within the body for a lifetime. The hazards from americium are comparable to those of plutonium.

- Uranium (U)
  Uranium is a heavy metal that occurs in nature in significant quantities. When newly machined, uranium has the appearance of stainless steel. After short exposure to the atmosphere, it oxidizes to a golden-yellow color and from that into black.

  Three forms of uranium have been used in nuclear weapons: natural, depleted, and enriched uranium.

  Natural Uranium: Mixture of uranium when it is first separated from its ore. There are three "natural" uranium isotopes

  - Depleted Uranium: Uranium with some amount of its U-235 extracted.

- Enriched Uranium: Uranium containing more than the naturally occurring U-235

Radiological hazards associated with any uranium isotope are usually less severe than those of plutonium. If uranium is taken internally, a type of heavy metal poisoning may occur. Lung contamination due to inhalation may cause a long-term hazard. When involved in fire, uranium melts and forms a slag, with only a part of it oxidizing; however, the possibility of hazardous airborne contamination exists, and protective measures must be taken to prevent inhalation or ingestion. A protective mask and standard personal protective clothing shall protect personnel against levels of uranium contamination expected at an accident site.

- Tritium (T)
  Tritium is a radioactive isotope of hydrogen and diffuses very rapidly in the air. The diffusion rate is measurable even through very dense materials such as steel. Tritium combines chemically with several elements. This chemical reaction produces heat. Like normal hydrogen, tritium may combine in a combustive reaction with air, forming water and releasing large amounts of heat. Metals react with tritium in two ways: plating, the deposition of a thin film of tritium on the surface of the metal; or hydriding, the chemical combination with the metal. In either case, the surface of the metal becomes contaminated.

  Tritium is a health hazard when personnel are responding to an accident that occurred in an enclosed space, and during accidents that occurred in rain, snow, or a body of water. In its gaseous state, tritium is not absorbed by the skin to any significant degree

- Thorium (Th)
  Thorium is a heavy, dense gray metal that is about three times as abundant as uranium. Thirteen isotopes are known, with atomic masses ranging from 223 to 235. Th-232 is the principal isotope. It decays by a series of alpha emissions to radium-225. Th-232 is not fissionable but is used in reactors to produce fissionable U-233 by neutron bombardment. A non-nuclear property of thorium is that, when heated in air, it glows with a dazzling white light.

  Thorium presents both a toxic and radiological hazard. Toxicologically, thorium causes heavy metal poisoning similar to lead or the uranium isotopes. Thorium accumulates in the skeletal system where it has a biological half-life of 200 years. A properly fitted respirator and standard personal protective clothing shall protect personnel against levels of thorium contamination expected at an accident site.

Primary Non-Radiological, Toxic Hazards are:

- Beryllium- which is a light, gray-white metal that resembles magnesium. Health hazards include acute or delayed pulmonary edema; ulceration and irritation of the skin; shortness of breath; chronic cough; cyanosis; loss of weight; extreme nervousness.
- Lithium (Li): Causes severe chemical burns
- Lead: Poisoning(kidney and bones); skin will turn yellowish and dry; digestion is impaired
- Plastics: Toxic hazard when burning

High explosive hazards are:

- Hydrazine: Hydrazine is a colorless, oily fuming liquid (ammonia odor). Hydrazine may explode when exposed to heat or chemical reaction. Hydrazine is self-igniting when absorbed on earth, wood, or cloth. Contact with any oxidized surface (rust) will result in combustion.
- Fuming Red Nitric Acid is a reddish brown, toxic, corrosive liquid. Fuming Red Nitric Acid reacts with water or steam to produce heat and toxic corrosive and flammable vapors
- Solid Fuel Rocket Motors
- Composite Fibers

12. Expeditionary and Contingency Operations

a. Given applicable references, describe facts about wartime response with at least an 80% accuracy. STS: 12.1.2., 12.1.3., 12.1.4., 12.1.5.

WARTIME RESPONSE

This objective will cover: ALERTCONS, DEFCONS and FPCONS, Principles of threat evaluation, Evaluating threats to air bases, Correlating states and stages of the alert to the threat.

ALERTCONS

In the event of a national emergency, a series of seven different Common Alert Conditions, or ALERTCONs**,** can be declared. The 7 ALERTCONs are broken down into 5 Defense Conditions (DEFCONs), 2 Emergency Conditions (EMERGCONs) and terrorist force protection conditions (FPCON).

DEFCONS
The military uses DEFCONs to get a command for war. DEFCONs are a uniform system of progressive alert postures used by the Joint Chiefs of Staff (JCS), commanders of unified and specified commands, and by the military services throughout the United States. They are graduated to match an increasing threat with increasing military preparedness. Annex C to WMP-1is the governing regulation for DEFCONs.

There are five (5) DEFCON levels. We will transition from DEFCON 5 to DEFCON 1 when a threat warrants it.

- DEFCON 5: Normal, peacetime readiness
- DEFCON 4: Normal, increased intelligence and strengthened security measures
- DEFCON 3: Increase in force readiness above normal readiness
- DEFCON 2: Further Increase in force readiness, but less than maximum readiness
- DEFCON 1: Maximum force readiness.

EMERGCONS
EMERGCONs are national level reactions in response to ICBM (missiles in the air) attack. By definition, other forces go to DEFCON 1 during an EMERGCON.

DEFENSE EMERGENCY: Major attack upon U.S. forces overseas, or allied forces in any area, and is confirmed either by the commander of a unified or specified command or higher authority or an overt attack of any type is made upon the United States and is confirmed by the commander of a unified or specified command or higher authority.

AIR DEFENSE EMERGENCY: an air defense emergency is an emergency condition, declared by the Commander in Chief, North American Aerospace Defense Command. It indicates that attack upon the continental United States, Canada, or US installations in Greenland by hostile aircraft or missiles is considered probable, is imminent, or is taking place.

FPCONS

The FPCON system is a DOD program standardizing the military services' identification of, and recommended responses to, terrorist threats against US personnel and facilities.

The different FPCON's are as follows:

Table 2.3. Terrorist Force Protection Condition (FPCON) System.

Condition	Application	Considerations
FPCON NORMAL	Applies when a general global threat of possible terrorist activity exists.	Warrants a routine security posture.
FPCON ALPHA	Applies when there is an increased general threat of possible terrorist activity against personnel or facilities, the nature and extent of which are unpredictable.	ALPHA measures must be capable of being maintained indefinitely.
FPCON BRAVO	Applies when an increased or more predict-able threat of terrorist activity exists.	Sustaining BRAVO measures for a prolonged period may affect operational capability and relations with local authorities.
FPCON CHARLIE	Applies when an incident occurs or intelligence is received indicating some form of terrorist action or targeting against personnel or facilities is likely.	Implementation of CHARLIE measures will create hardship and affect the activities of the unit and its personnel.
FPCON DELTA	Applies in the immediate area where a terrorist attack has occurred or when intelligence has been received that terrorist action against a specific location or person is imminent.	Normally, this FPCON is declared as a localized condition. FPCON DELTA measures are not intended to be sustained for substantial periods.

Figure 12-1

Principles of Threat Evaluation

Commanders are expected to assess and identify the most likely threats at both home station and their deployed locations, and tailor their forces to conduct operations to counter them. AFI 10-2501 and AFI 10-245, include standards, processes, and procedures to identify threats, determine vulnerabilities, and develop effective countermeasures.

Airbases can be targeted by many different types of weapons systems. Fortunately, only a few categories of weapons have the range and delivery means to be viable threats. An analysis of the specific airbase threats is required to effectively apply this information under wartime conditions. Defensive planners must understand the unique capabilities, characteristics, attack profiles, and weaknesses of these weapons to develop effective countermeasures and defensive plans. This chapter discusses those commonalities and provides a framework to evaluate and mitigate threats to airbases.

Air Force people and weapons systems are vulnerable to CBRNE threats at both CONUS and locations outside the continental United States (OCONUS). This potential for attack requires the Air Force to adopt deliberate, pre-planned courses of action to counter general CBRNE threats. It also requires the ability to adjust actions to counter specific threats identified through intelligence analysis or post-attack reconnaissance information.

Military involvement to advance and protect US interests may include war and MOOTW such as peace operations, homeland security/defense (HLS/D), foreign humanitarian assistance (FHA) and other MSCA. Commanders have the responsibility to consider the implications of a potential adversary's CBRNE capabilities not only in the adversary's geographic region, but also in other regions.

Evaluate Threats to Air Bases

The installation TWG will develop the assessment as outlined in AFI 10-245, *Air Force Antiterrorism/Force Protection Program Standards*. Use this assessment for deliberate and execution planning, exercise scenario development and evaluation, and Anti-Terrorism/Force Protection Vulnerability Assessments. This assessment is conducted by AFOSI and intelligence annually, when significant threat changes occur, and prior to exercise or actual deployment of forces. Consult AFMAN 10-2602, AFH 10-2502 and AFPAM 32-4019 for further detail and guidance for performing assessments. Annual reviews of the passive defense program, in relation to the threat; may drive adjustments to wing operations. Changes in threats or vulnerability assessments may require revisions in the deliberate planning and operational procedures. Commanders and planners will consult the appropriate organizations and documents as the starting point for assessing the threat.

Program management, exercise and administrative information will not be included in the Emergency Management Plan 10-2. These items are to be included in a

supplemental document for use with the Emergency Management Plan 10-2, without duplication in related installation plans. Installation commanders must protect assigned people, material, equipment and facilities from the effects of enemy attacks to the maximum extent of current capabilities.

Correlate States and Stages of Alert to the Threat

A system known as "states and stages of alert" exists at overseas locations. *A significant difference between this system and the DEFCONs is that our allies use the same basic system*. Therefore, when faced with a regional threat, all friendly forces transition towards General War at the same pace and interoperability is maximized. The primary source document for this system is called the "Emergency Action File (EAF)". The same general implementation rules and security considerations used for DEFCONs apply to the "states and stages of alert" system as well.

12. Expeditionary and Contingency Operations

b. Given applicable references, describe facts about alert and warning systems with at least an 80% accuracy. STS: 12.1.7.4., 12.1.7.5.

ALERT WARNING SYSTEMS

This objective will cover: warning times for air missile, and ground threats and integrate with host nation, joint, and combined forces.

Warning Times for Air, Missile, and Ground Threats

Airbase staffs must analyze their warning system and develop likely timelines for each warning event from missile launch to impact. The table shows a method to identify the warning timelines from three different launch sites capable of targeting the airbase. An actual analysis would include the actual or expected time for each event in the warning chain. These events may show that a window of opportunity exists for the commander to direct last minute actions to continue missions or protect highly vulnerable resources.

Protective actions for missile attacks are not always as simple as declaring Alarm Red. The operations and support staff must use the warning timelines to develop and practice missile launch responses for likely day and night mission and support scenarios. Examples may include missile launch warning receipt during aircraft generation and recovery, cargo aircraft loading or unloading, bomb buildup, post-attack reconnaissance, or combat turn operations. Depending on the estimated time to impact, the commander may direct some operations to continue (such as tactical and cargo

aircraft launch-to-survive) or safely terminate (fueling, aircraft taxi, munitions loading). Pre-planned actions may include direction through functional area channels to implement "last second" contamination avoidance and protective actions regardless of Alarm Red declaration. Examples may include moving equipment, munitions, and aircraft into shelters, closing hardened aircraft shelter or hanger doors, moving casualties under protective cover, or moving munitions in transit to shelter. Pre-planned actions and coordinated execution can limit the inherent risk to personnel and reduce attack damage and contamination.

Theater warning systems should detect and warn the airbase of enemy fighter and bomber aircraft activity and track their flight profiles. However, it may be more difficult to track helicopters, light aircraft, or remotely piloted vehicles. If no prior warning of aircraft attack is received, use the missile attack procedures to warn and protect the airbase.

The aircraft attack warning process is similar to the missile warning process, with the exception that warning times may permit the commander to implement pre-planned, Alarm Yellow actions. The table shows how the staff identifies aircraft attack warning timelines for three likely airbase attack ingress routes. The actual analysis includes the actual or expected time for each event in the warning chain. These events show how long the airbase can take advantage of Alarm Yellow actions and establish an approximate time for declaration of Alarm Red. Alarm Yellow actions should be pre-planned and time-phased to achieve the highest defensive posture possible shortly before Alarm Red is declared.

Table 2.5. Example of TBM Warning Time Assessment for Airbase Attack.

Launch Location	Time (In Minutes) to Complete Action								
	Missile Launch	Theater Detect	Theater Warns	WOC* Receives	WOC Decision	Alarm Red	Total Time	Flight Time	Difference
Site 1	0	:30	1:00	:30	1:00	:30	3:30	4:30	+1:00
Site 2	0	:30	1:00	:30	1:00	:30	3:30	4:45	+1:15
Site 3	0	:30	1:00	:30	1:00	:30	3:30	6:10	+2:40

NOTE: Use actual TBM threat information, distances, and warning transmission times to develop a warning time assessment for a specific location.

* WOC - Wing Operations Center or equivalent

Figure 12-2

Table 2.6. Example of Aircraft Warning Time Assessment for Airbase Attack.

Attack Ingress Route	Time (In Minutes) to Complete Action								
	Cross Threshold	Theater Detect	Theater Warns	WOC Receives	WOC Decision	Alarm Red	Total Time	Flight Time	Difference
1	0	:30	1:00	:30	1:00	:30	3:30	19.00	+15:30
2	0	:30	1:00	:30	1:00	:30	3:30	23:00	+19:30
3	0	:30	1:00	:30	1:00	:30	3:30	27.00	+23:30

NOTE: Use actual aircraft threat information, distances, and warning transmission times to develop a warning time assessment for a specific location.

Figure 12-3

Integrate with Host Nation, Joint and Combined Forces

Commanders use Air Force standardized warning signals to posture airbases for attacks, warn of attacks in progress, initiate post-attack recovery actions, and return the air base to a normal wartime state of readiness. The effective use of a rapid, multi-capability airbase warning system is crucial to force protection and mission operations. Without it, airbase actions are slow and disjointed. Control is limited in situations such as an airbase response to a combination missile and ground force attack.

Use warning signals that are compatible with host-nation, local, or theater systems. The base warning system must provide effective coverage for all airbase areas. Display warning signal visual aids in all work centers and common use areas (such as billeting tents, post office, latrines, dining facilities, and recreation areas). Provide local warning signal and protective action information, such as a handout, to all permanent party and transient personnel upon arrival. Transient personnel include aircrew, passengers, noncombatants, and all other personnel not assigned to the airbase.

An integrated warning and reporting system provides a significant measure of protection by allowing friendly forces to minimize exposure to the hazard. Accurate and timely understanding of the hazard and its effects minimizes the possibility of either excessive or inadequate protection of the force, maintaining a protective posture longer than necessary or misusing CBRNE defense assets. These assets are combat multipliers and must be managed effectively to support the campaign plan and protect capabilities with high vulnerabilities to the effects of CBRNE weapons. Joint and multinational exercises must include realistic standards for conducting operations in CBRNE environments.

12. Expeditionary and Contingency Operations

c. Given applicable references, describe facts about biological warfare agent characteristics with at least an 80% accuracy. STS: 12.3.3.1.

BIOLOGICAL WARFARE AGENTS

This objective will cover General characteristics of biological agents, Military application of biological agents, Changes in biotechnology and Novel BW agents

General Characteristics of Biological Agents

Biological warfare (BW) 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 the impacts of biological weapon use, one must first understand the nature of the likely biological agents and how they work.

BW events and agents vary so dramatically that 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.

Adult Smallpox Case

Figure 12-4

Military Application of Biological Agents

The military application of biological agents concerns those microorganisms that may be deliberately employed in weapon systems to cause disease or death to man, animals,

or plants. Biological agents consist of microorganisms such as pathogens (which include disease-causing bacteria, rickettsiae, and viruses) and toxins.

Figure 12-5

Changes in Biological Warfare Technology

The delayed onset of symptoms and detection, identification, and verification difficulties for biological agents can also award important advantages to adversaries who decide to use biological agents. Genetic engineering gives BW developers the tools to pursue agents that could defeat the protective and treatment protocols of the prospective adversary. Genetically engineered microorganisms also raise the technological hurdle that must be overcome to provide for effective detection, identification, and early warning of BW attacks.

Numerous characteristics need to be controlled for a highly effective BW agent. Historically, the accentuation of one characteristic often resulted in the attenuation of one or more other characteristics, possibly even rendering the modified agent ineffective as a weapon. Advances in biotechnology, genetic engineering, and related scientific fields provide ever-increasing potential to control more of these factors, possibly leading to an enhanced ability to use BW agents as battlefield weapons.

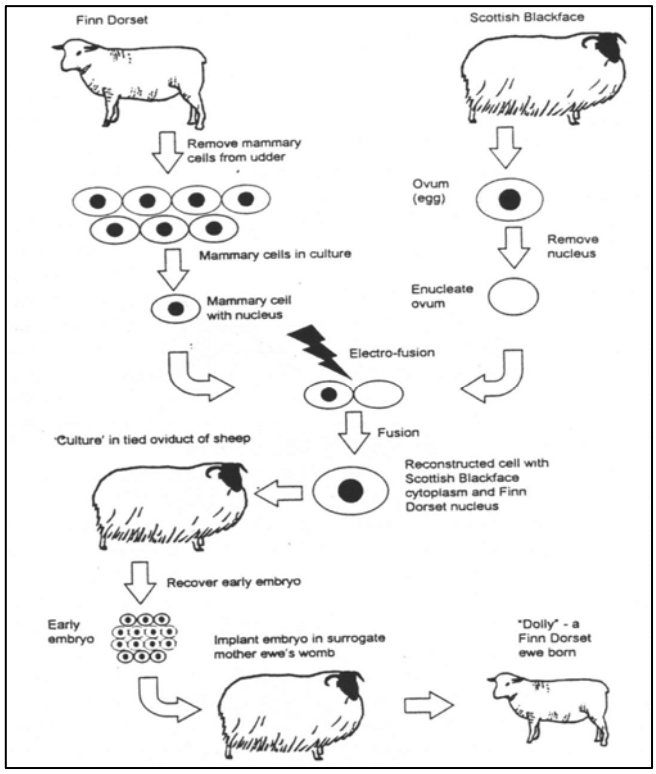


Figure 12-6

Novel BW Agents

Advances in biotechnology and genetic engineering may facilitate the development of potentially new and more deadly BW agents. The ability to modify microbial agents at a molecular level has existed since the 1960s, when new genetic engineering techniques were introduced, but the enterprise tended to be slow and unpredictable. With today's techniques, infectious organisms can be modified to bring about disease in different ways. The current level of sophistication for many biological agents is low, but there is enormous potential—based on advances in modern molecular biology, fermentation, and drug delivery technology—for making more sophisticated weapons. The BW agents may emerge in two likely categories: man-made manipulations of classic BW agents and newly discovered or emerging infectious diseases. An example of a recent new pathogen (though not necessarily ideal BW agents) includes streptococcus pneumonia S23F, a naturally occurring strain of pneumonia resistant to at least six of the more commonly used antibiotics.

The potential types of novel biological agents that could be produced through genetic engineering methodologies are listed below. Each of these techniques seeks to capitalize on the extreme lethality, virulence, or infectivity of BW agents and exploit this potential by developing methods to deliver more efficiently and to control these agents on the battlefield.

- Benign microorganisms genetically altered to produce a toxin, venom, or bioregulator.

- Microorganisms resistant to antibiotics, standard vaccines, and therapeutics.

- Microorganisms with enhanced aerosol and environmental stability.

- Immunologically altered microorganisms able to defeat standard identification, detection, and diagnostic methods.

12. Expeditionary and Contingency Operations

d. Given applicable references, describe facts about the classification of biological warfare agents with at least an 80% accuracy. STS: 12.3.3.2.1., 12.3.3.2.2., 12.3.3.2.3.

CLASSIFICATION OF BIOLOGICAL WARFARE AGENTS

This objective will cover: Pathogens, toxins, bioregulators, prions and uses.

Biological Agent Classification

Biological Agents can be classified according to biological agent types and uses. The different types of biological agents are pathogens, toxins, bioregulators and prions. The different uses are anti-plant, anti-animal, antipersonnel and anti-material.

Figure 12-7

Figure 12-8

Pathogens
Pathogens are disease-producing microorganisms that can be either naturally occurring or altered by random mutation or recombinant DNA techniques. They include:

- Bacteria
- Rickettsiae
- Viruses

Bacteria
Bacteria, a type of pathogen, are single celled, microscopic, living organisms. Some examples of different bacterial pathogens of military concern can be found in AFTTP (I) 3-2.55, Chapter 4.

Bacteria
Bacillus anthracis (Anthrax)
Brucella abortus (Brucellosis)
Brucella melitensis (Brucellosis)
Brucella suis (Brucellosis)
Chlamydia psittaci (Psittacosis)
Clostridium botulinum (Botulism)
Francisella tularensis (Tularemia)
Burkholderia mallei, formerly Pseudomonas mallei (Glanders)
Burkholderia pseudomallei, formerly Pseudomonas pseudomallei (Melioidosis)
Salmonella typhi (Typhoid Fever)
Shigella dysenteriae (Shigellosis)
Vibrio cholerae (Cholera and other Vibrioses)
Yersinia pestis (Plague)

Figure 12-9

Rickettsiae
Rickettsiae, another type of pathogen, are intracellular and parasitic. Some examples of different rickettsiae pathogens of military concern can be found in AFTTP (I) 3-2.55, Chapter 4.

Rickettsia
Coxiella burnetii (Q Fever)
Bart quintana, formerly Rochalimaea quintana or Rickettsia quintana (Trench Fever)
Rickettsia prowasecki (Typhus Fever)
Rickettsia rickettsii (Rocky Mountain Spotted Fever)

Figure 12-10

Virus

Viruses, the last type of pathogen are composed of RNA and DNA. Some examples of different virus pathogens of military concern can be found in AFTTP (I) 3-2.55, Chapter 4.

Viruses
Chikungunya virus
Crimean-Congo hemorrhagic fever virus
Dengue fever virus
Eastern equine encephalitis virus
Ebola virus
Hantaan virus
Junin virus
Lassa virus
Lymphocytic choriomeningitis virus
Machupo virus
Marburg virus
Monkeypox
Rift Valley Fever virus
Tick-borne encephalitis virus
(Russian Spring-Summer encephalitis virus)
Variola virus
Venezuelan equine encephalitis virus
Western equine encephalitis virus
Yellow fever virus
Japanese encephalitis virus

Figure 12-11

Toxins

Another type of biological warfare agent is toxins. Toxins are poisons derived from plants or animals. For example Ricin is a toxin that comes from the castor bean. They can be manufactured through synthetic processes as well. Toxins are produced by a variety of organisms, including microbes, snakes, insects, spiders, sea creatures and plants. Since toxins are non-living they are not transmissible. Some examples of different toxins of military concern can be found in AFTTP (I) 3-2.55, Chapter 4.

Toxins
Botulinum toxins
Clostidium perfringens toxins
Conotoxin
Ricin
Saxitoxin
Shiga toxin
Staphylococcus aureus toxins
Tetrodotoxin
Verotoxin
Microcystin
Trichothecene mycotoxin (see Note)

Figure 12-12

Bioregulators
Bioregulators are another type of biological warfare agents. They include biochemical compounds that regulate cell processes and physiologically active compounds such as catalysts and enzymes. Although they can be found in the human body in small quantities, introduction of large quantities can cause severe adverse effects or death.

Prions
The last types of biological agents are Prions. Prions are proteins that can cause neurodegenerative disease in humans and animals. Proteins have a unique, genetically defined amino acid sequence that determines their specific shapes and functions. Normal cell proteins have the same amino acid building blocks but they fold differently than Prions. When Prions enter brain cells, they apparently convert normal proteins into Prions. Ultimately, the infected brain cells die and release Prions into the tissue. These Prions enter, infect and destroy other brain cells. Prions entered the public's consciousness during the mad cow epidemic that hit England in 1996. Transmission of the prions from cows to man is suspected to cause human illness. There are no known therapies effective against prions.

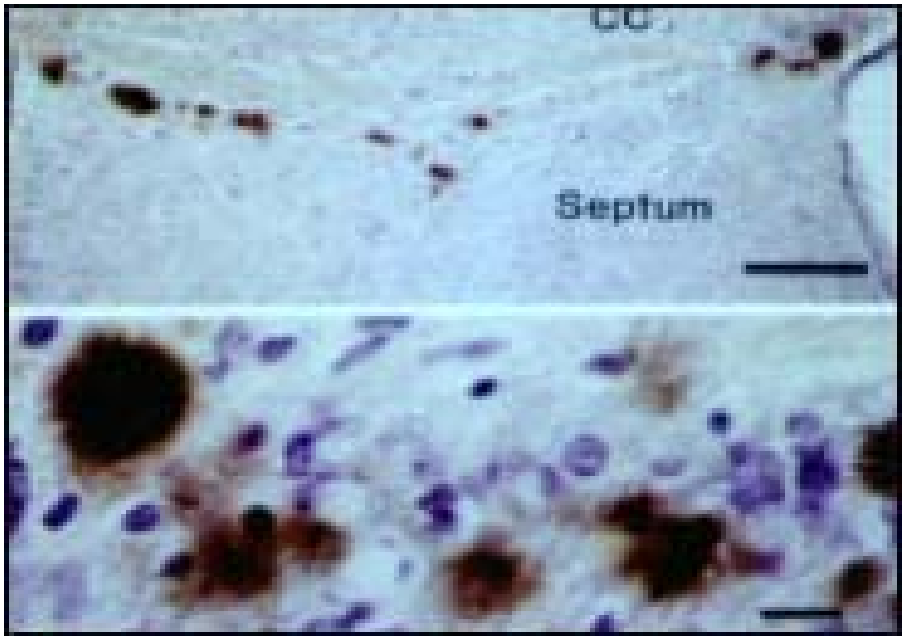


Figure 12-13

Biological Agent Use

There are four uses for biological warfare agents. Anti-personnel, Anti-animal, Anti-plant and Anti-material. Biological antipersonnel agents are those that are effective directly against humans. The enemy would select these agents on the basis of the agents' ability to cause death or disability. Potential biological antipersonnel agents include toxins, bacteria, rickettsiae and viruses. Anti-animal agents are biological agents that could be employed against animals to incapacitate or destroy them through disease. This could lead to serious consequences for a country's food supply or export of animal products. Biological anti-plant agents are live organisms that cause disease or damage to plants. These could be used by an enemy to intentionally attack food or economically valuable crops, thereby reducing a nation's ability to resist aggression. Anti-material agents are organisms that degrade or break down some item or material. For example, fungi may damage fabrics, rubber products, leather goods, or foodstuffs. Some bacteria produce highly acidic compounds that cause pitting in metals; these agents could create potential problems with stockpiled material.

12. Expeditionary and Contingency Operations

e. Given applicable references, describe facts about the indicators and symptoms of biological warfare agents with at least an 80% accuracy. STS: 12.3.3.3.

INDICATORS AND SYMPTIONS OF BIOLOGICAL WARFARE AGENTS

This objective will cover the indicators and symptoms of biological warfare agents

Indicators and Symptoms

Indicators and symptoms of specific biological agents can be found in AFTTP (I) 3-2.55, Chapter 4.

In AFTTP (I) 3-2.55, Chapter 4 for each agent the following items are addressed:

- Infectious Agent: This identifies the specific pathogen that causes the disease, classifies the pathogen, and may indicate any of its important characteristics.

- Occurrence: This provides information on where the disease is known to be prevalent and/or in what population groups it is most likely to occur.

- Reservoir: This Indicates the ultimate and/or intermediate human, animal, arthropod, plant, soil, or substance (or a combination of these) in which an infectious agent normally lives and multiplies, on which it depends primarily for survival, and where it reproduces itself in such a manner that it can be transmitted to a susceptible host.

- Transmission: This describes the mechanisms by which an infectious agent is spread to humans. Such mechanisms include direct, indirect, and airborne.

- Direct transmission: This can be by direct contact (such as touching or biting), or by the direct projection (droplet spread) of droplet spray onto the conjunctiva or onto the mucous membranes of the eye, nose, or mouth during sneezing, coughing, spitting, singing, or talking (usually limited to a distance of about 1 meter or less).

- Indirect transmission: This can be vehicle- or vector-borne.

- Airborne transmission: This is the dissemination of microbial aerosols to a suitable portal of entry—usually the respiratory tract.

- Symptoms: This describes the symptoms of the disease.

- Incubation period: This identifies the interval (in hours, days, or weeks) between initial, effective exposure to an infectious organism and the first appearance of symptoms of the infection.

- Communicability: This describes the time (days, weeks, or months) during which an infectious agent may be transmitted, directly or indirectly, from an infected person to another person or from an infected animal to humans.

- Prevention: This describes prophylaxis measures.

- Delivery: This describes the most likely means to disseminate the agent.

12. Expeditionary and Contingency Operations

f. Given applicable references, describe facts about the lethal levels of biological warfare agents with at least an 80% accuracy. STS: 12.3.3.4.

LETHAL LEVELS OF BIOLOGICAL WARFARE AGENTS

This objective will cover dosage, rate of action, infection factors and lethality of selected biological agents.

Biological Warfare agents are inherently more toxic than CW nerve agents on a weight-for-weight basis and can potentially provide broader coverage per pound of payload than CW agents.

Dosage

The Infective Dose of an agent refers to the relative ease with which microorganisms establish themselves in a host species. Pathogens with high infectivity cause disease with relatively few organisms.

The lethal Dose refers to how much agent it takes to kill someone. Some pathogens produce toxins that can result in disease (for example, anthrax, botulinum, cholera, diphtheria and typhus). The extreme toxicity of many toxins causes the lethal dose to be much smaller than that of chemical agents. Hence, units of micrograms or even nanograms may be used instead of milligrams in expressing toxicity.

Figure 12-14

Rate of Action

The Rate Of Action of toxins varies widely. Rapid-acting toxins generally incapacitate within minutes. Delayed-acting agents may take several hours to days to incapacitate. The time for maximum effects of pathogens in normally more than 24 hours (unless the pathogen produces a toxin). However, the incubation periods of microorganisms used in biological warfare may be far shorter than those expected by examining the natural disease.

The incubation period is the interval (in hours, days, or weeks) between initial, effective exposure to an infectious organism and the first appearance of symptoms of the infection.

Figure 12-15

Infection Factors

Some factors involved in infection are portals of entry, the infective dose of the pathogen and the virulence of the infecting organism.

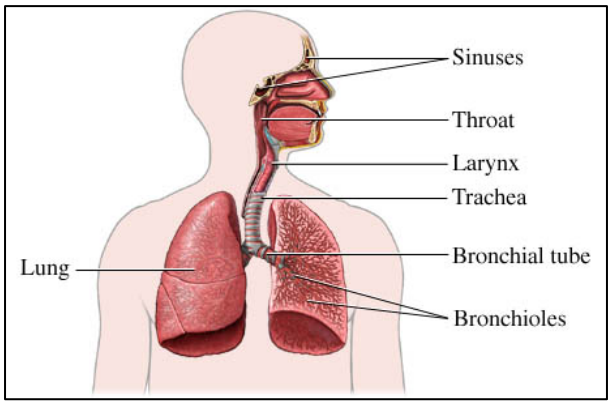


Figure 12-16

The first factor involved in infection is the portal of entry. The different portals of entry are:

- The respiratory tract which is the primary route of entry because it is more susceptible to penetration.

- The skin is another portal of entry. The body is more resistant to invasion by microorganisms through the skin, however it may occur. This is particularly true of broken surfaces and some toxins such as mycotoxins. This could also be accomplished through the bite of an arthropod vector, injection, or absorption. Some examples of arthropod vectors are:

    - Mosquitoes: Yellow fever, dengue fever, encephalitis
    - Flies: Typhoid fever, dysentery, asiastic cholera
    - Lice: epidemic typhus and trench fever
    - Fleas: endemic typhus, plague
    - Ticks and Mites: Rocky Mountain spotted fever

- Another portal of entry is exposed mucosal surfaces which are the moist surfaces of the nose, mouth and eyes are extremely vulnerable to biological agents.

- The last portal of entry is the digestive tract. Contaminated food or water consumed by an individual can be absorbed through the digestive tract.

The second factor involved in infection is infective dose, and is broken down into number of organisms required to produce an infection and the physiological factors of the host. Certain physiological factors, such as body temperature and diet, contribute to susceptibility. Certain physiological or pathological characteristics of the host, such as debilitation resulting from fatigue, alcoholism, irradiation, aging, or overexposure to extreme temperatures also play an important role in determining the susceptibility of an individual to infections.

Virulence is the third factor involved in an infection. It is the measure of the severity of the disease that a pathogen is able to produce. There are two contributing factors to virulence, invasiveness, and toxicity.

Invasiveness is the relative ability of a microorganism to break down the body's defenses and spread throughout the body.

Toxicity is defined as the quality of being poisonous

Toxicity of Selected Biological Agents

The toxicity of selected biological agents is located in AFTTP (I) 3-2.55, Appendix I. Toxicity is defined as very low, low, moderate, high, very high, dependent on DNA, or unknown. Lethality and stability information is based on studies of natural, endemic strains of these agents. There is potential that the lethality and/or stability of some agents may be changed through various laboratory alterations and/or the use of stabilizing chemicals.

12. Expeditionary and Contingency Operations

g. Given applicable references, describe facts about the methods of dissemination for biological warfare agents with at least an 80% accuracy. STS: 12.3.4.

METHODS OF DISSEMINATION OF BIOLOGICAL WARFARE AGENTS

This objective will cover: general term of dissemination for biological agents, Inhalation or Aerosol route of entry, and Percutaneous portal of entry, Oral route of entry, covert dissemination, and weaponized dissemination

Dissemination

The term "dissemination" refers to the intentional release of a biological agent by an adversary so that it will reach the portals of entry of target personnel in a viable and virulent state. Based on the portals of entry, the characteristics of agents used, and the results desired, certain methods of dissemination are feasible for biological attacks. The effectiveness of these methods is determined by physical and environmental factors that limit the ability of the agent to establish infection.

Inhalation of Aerosol Route of Entry

Inhalation route of entry would be accomplished by disseminating the agent as an aerosol. An aerosol is comprised of finely divided particles, either liquid or solid, suspended in a gaseous medium. Examples of common aerosols are dust, fog, and smoke. A biological agent aerosol is defined as an airborne suspension of particles containing biological agents.

Figure 12-17

Characteristics of Aerosol Dissemination:

- Difficulty of Detection: A biological agent aerosol in field concentrations
  cannot be detected by the physical senses.
- Capability of Penetration: Aerosol particles tend to diffuse in much the
- same manner as a gas. The aerosol cloud travels with the wind and is capable of diffusing into nonairtight structures that are not equipped with adequate filtering devices.
- Difficulty of Diagnosis: The classical symptoms of a disease associated with a particular agent can mimic the symptoms of diseases, such as the flu.
- Increased Severity and Mortality Rate: Certain diseases have altered
- incubation periods and incapacitation times and increased mortality rates when the agent enters the body through the respiratory tract. This is the result of the organism diffusing directly into the

bloodstream and being carried by the blood directly to the body tissues.

- Massive Overdoses: Personnel might be exposed to massive overdoses of an agent through the use of an aerosol. Thus, the acquired immunities of target personnel might be overcome by the use of selected agents.
- Increased Susceptibility: Man has a constant requirement for oxygen;
- therefore, he is breathing continually. This increases the probability of contacting an airborne organism.

For the biological agent aerosol to be effective, it must reach target personnel. Particle size is a critical factor in lung infections. Particles in the size range from 1 to 5 microns are much more capable of passing through the defensive barriers of the upper respiratory tract and of being retained in the lungs than those below or above this size range.

Particles in the proper size range can be formed by physically breaking up a substance. This can be accomplished by release through a nozzle or a spray or by an explosive force. There are three general methods of forming biological agent aerosols Generator, Spray, Explosive Force.

Figure 12-18

Figure 12-19

Percutaneous Portal of Entry

A second portal of entry that can be utilized for biological agent employment is the skin. Penetration of the skin can be accomplished by the bite of an arthropod vector (carrier), injection, or absorption.

Arthropod Vector. These insects are capable of transferring pathogens to man

through breaks in the skin. For the purpose of this manual, the definition of “vector” is limited to the arthropods. The spread of pathogens by arthropod vectors to man is well established in history.

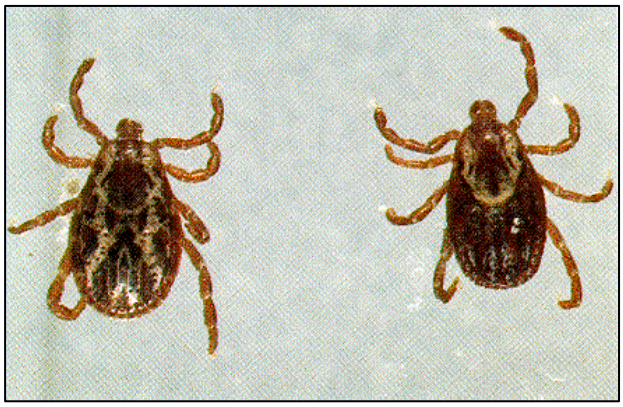


Figure 12-21

Figure 12-22

Biological agents can be injected through the skin. In 1978, Bulgarian exile Georgi Markov, was attacked in London, England, with a device disguised as an umbrella. The weapon discharged a tiny pellet in the subcutaneous tissue of his leg while he was waiting for a bus. He died days later. The pellet, which contained Ricin, was found during autopsy. A Flechette is another penetrating device.

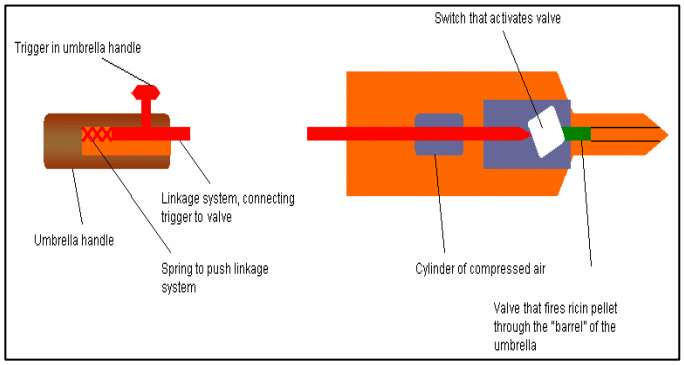


Figure 12-23

Biological agents may be absorbed through the skin or placed on the skin to do damage to the integument.

Oral Route of Entry

Another possibility is through the oral route by ingestion of contaminated food or water supplies. Contamination with toxins of chlorinated water, rivers, lakes, or reservoirs would be difficult because of dilution effects.

Figure 12-24

Covert Dissemination

Biological agents lend themselves well to covert or hidden operations because of detection difficulties, the variety of potential agents, the ways they might be employed, and the small amounts of materials required to cause infection. Sabotage is the direct application, by a person, of material to the target. It is generally covert in nature.

Covert use of biological agents might be aimed primarily at the respiratory tract and secondly at the digestive tract. Since many pathogens are spread naturally in food and water, these provide proven vehicles in which the saboteur could employ an agent. The respiratory tract is an excellent target for the small-scale employment of a biological antipersonnel agent aerosol.

Figure 12-25

Weaponized Dissemination

Some weaponized delivery methods are:

- Theater Ballistic Missiles (TBM) which are viable delivery means for many agents. With bulk warheads, release can be an explosive or line release.
- Submunitions are effective because the size of the submunition pattern allows area targets to be more effectively attacked.
- Ground sprayers can be vehicle mounted or stationary. Aircraft sprayers can yield dosage patterns that cover very large areas.
- Mortar, artillery, and multiple rocket launchers (MRL) attacks can deliver an extremely large amount of agent very accurately.
- Shells filled with BW agents can be used in a combined attack with chemical and conventional explosive shells.

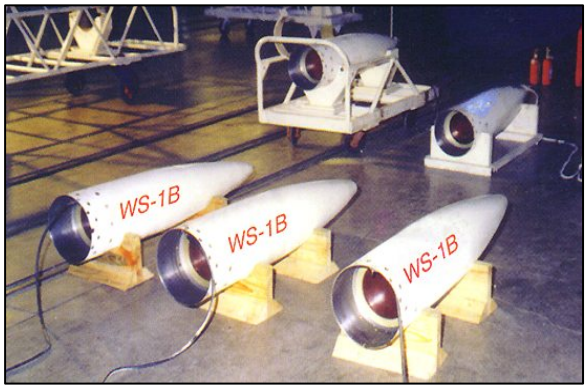


Figure 12-26

Figure 12-27

Vector-Mediated attacks are insects and other animals are utilized to disseminate BW agents. Fomite Spread is the use of inanimate objects to spread agents is another potential way to disseminate biological agents, such as smallpox. Food or Consumer Product Contamination are vulnerable to tampering and contamination. Water Contamination is a viable mean of contamination because some pathogens can grow in water, survive for considerable lengths of time, or survive the normal chlorination and filtration treatments in municipal water supply systems.

12. Expeditionary and Contingency Operations

h. Given applicable references, describe facts about the policies concerning chemical agent use with at least an 80% accuracy. STS: 12.4.2.

POLICIES CONCERNING CHEMICAL AGENTS

This objective will cover toxic chemical agent use in war, chemical weapons convention, herbicide use in war and riot control use in war.

Toxic Chemical Use in War

The US seeks to achieve a verifiable worldwide ban on chemical weapons. Until this verifiable ban is achieved, the US policy is to deter enemy chemical weapons use through denying the enemy a significant military advantage for such use. US chemical weapons deterrence includes a viable NBC defense capability.
The United States will not use chemical weapons in accordance with the Chemical Weapons Convention.

Chemical Weapons Convention (CWC)

The CWC was ratified on 25 April 1997 after push from President Bill Clinton and former Secretary of state Ret. General Colin Powell

President Clinton in talking about the ratification of the CWC said:

> *"At the bottom line, our failure to ratify will substantially increase the risk of a chemical attack against American service personnel; none of us should be willing to take that. As commander in chief, I cannot in good conscience take that risk. "*

Retired General Colin Powell agreed by stating:

> *"It's in the best interest of America. It's in the best interest of America's fighting men and women. "*

The United States ratified the Convention on the Prohibition of the Development, Production, Stocking, and Use of Chemical Weapons, and their destruction (CWC) on 25 April 1997. The CWC, which entered into force on 29 April 1997, bans the United States from:

- Development
- Production
- Acquisition

- Stockpiling
- Transferring
- Use

It also requires the destruction of all Chemical weapons stocks within ten years after its entry into force.

Herbicide Use in War

We will not use herbicides in war unless our adversaries employ them first and the President directs their use in retaliation. Executive order 11850 renounces first use of herbicides in war except to control vegetation within bases or installations, or around their immediate defensive perimeters.

Figure 12-28

Riot Control Agent Use in War

The US renounces first use of Riot Control Agents (RCA's) in war except in defensive military modes to save lives. Some examples of defensive modes are:

- Riot control situations under direct and distinct US control to include control of rioting prisoners of war.
- Situations in which civilians are used to mask or screen attacks and these agents can reduce or avoid civilian casualties.
- Rescue missions in remote or isolated areas.
- Protection of convoys from civil disturbances

- Security operations regarding the protection or recovery of nuclear weapons.

The President must approve the use of riot control agents in war.

Figure 12-29

12. Expeditionary and Contingency Operations

i. Given applicable references, describe facts about chemical warfare agents with at least an 80% accuracy. STS: 12.4.3.2., 12.4.3.3., 12.4.3.4., 12.4.3.5., 12.4.3.6., 12.4.3.7., 12.4.3.8..

CHEMICAL WARFARE AGENTS

This objective will cover: signs and symptoms, agent physical properties, dissemination methods, deposition patterns and droplet sizes, incapacitating levels (to include miosis), lethal levels and interaction with various surfaces.

Signs and Symptoms

There are 5 types of chemical Warfare Agents: Choking, nerve, blood, blister and incapacitating. Some signs and symptoms of those agents are:

Choking Agents
Choking Agents are agents that attack lung tissue, primarily causing pulmonary edema. Pulmonary edema is the medical term for dry land drowning. They cause irritation to the throat and nose. Initial symptoms may include tears, dry throat, and coughing, choking, tightness of chest, nausea, vomiting, and headache. In extreme cases membranes swell and the lungs become filled with liquid. Death results from lack of oxygen, choking the individual.

Figure 12-30

Nerve Agents

Nerve Agents affect the body by inhibiting acetycholinesterease in the body. When a normally functioning motor nerve is stimulated it releases the neurotransmitter acetylcholine, which transmits the impulse to a muscle or organ. Once the impulse is sent, the enzyme acetylcholinesterease immediately breaks down the acetylcholine in order to allow the muscle or organ to relax. Nerve agents disrupt the nervous system by inhibiting the enzyme acetylcholinesterase by forming a covalent bond, or barrier, around the enzyme. This prevents the acetylcholine from undergoing hydrolysis (or breaking down). The result is that acetylcholine builds up and continues to act so that all nerve impulses are continually transmitted, and the muscle contractions do not stop.

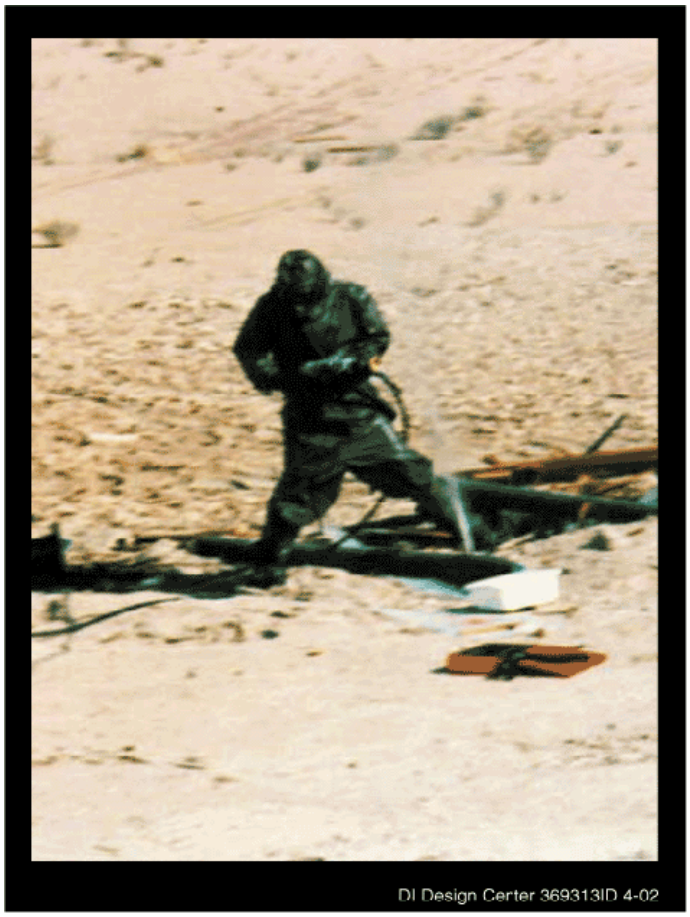


Figure 17. UNSCOM 20 photograph of a geyser of nerve agent from a 122-mm rocket at Khamisiyah Pit drilled for sampling.

Figure 12-31

Symptoms of nerve agent poisoning are broken down into mild and severe:

- Mild poisoning (self-aid): Casualties with MILD symptoms may experience most or all of the following: Unexplained runny nose, Unexplained sudden headache, Sudden drooling, Difficulty seeing (dimness of vision and miosis), Tightness in the chest or difficulty breathing, Wheezing and coughing, Localized sweating and muscular twitching in the area of the contaminated skin, Stomach cramps, Nausea with or without vomiting, Resting heart rate of over 100 beats per minute (Tachycardia) followed by a drop of the heart rate to under 60 beats per minute (bradycardia)

- Severe poisoning (buddy aid): Casualties with SEVERE symptoms may experience most or all of the MILD symptoms, plus most or all of the following:

    - Strange or confused behavior, Increased wheezing and increased difficulty breathing (dyspnea), Severely pinpointed pupils, Red eyes with tearing, Vomiting, Severe muscular twitching and general weakness, Involuntary urination and defecation, Convulsions, Unconsciousness, Respiratory failure, Bradycardia

Blood Agents

Blood Agents affect the body differently depending on the type. Cyanogen blood agents (AC, CK) affect the bodily functions by inactivating the cytochrome oxidase system. This poisoning prevents cell respiration and the normal transfer of oxygen from the blood to body tissues. Arsine (SA) Blood agents causes alteration, dissolution and destruction of the red blood cells (hemolysis).

Figure 12-32

Blister Agents

Blister Agents act on the eyes, mucous membranes, lungs, skin and blood-forming organs. They cause blisters, destruction of body tissues, and organ damage. They are divided into three groups: mustards, arsenicals, and urticants. Mustards are insidious in nature (they do not cause pain on contact) and they cause fluid filled blisters after being on the skin for a while, arsenicals cause some pain on contact and have delayed blistering, urticants cause severe pain on contact and cause lesions resembling hives instead of fluid filled blisters.

Figure 12-33

Incapacitating Agents
Incapacitating Agents: They do not seriously endanger life except in cases exceeding many times the effective dose, and they produce no permanent injury.

Agent Physical Properties

Readiness personnel in the field do not need to know exact chemical composition of matter, including chemical agents. However, the behavior of these agents in the environment directly results from their composition. Therefore, composition is important. Understanding these terms and their applicability will help you better understand the behavior of agents.

Molecular Weight (MW)
Molecular Weight (MW) is the value represented by the sum of the atomic weights of all the atoms in the molecule. Example: MW of air is 29

High molecular weights tend to indicate solids while low weights tend to indicate gases. Molecular weight can be used to calculate vapor density by dividing the MW by 29. The larger the MW, the heavier the agent.

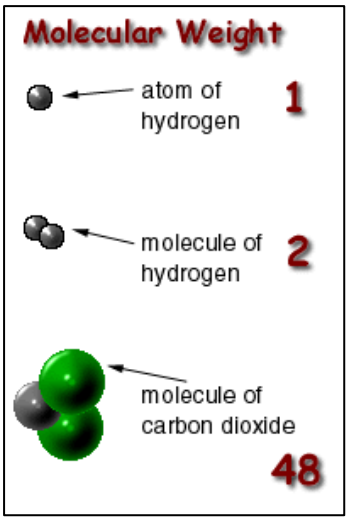


Figure 12-34

Vapor Density (VP)
The ratio of any gas or vapor to the density of air, under the same conditions of temperature and pressure is called its vapor density. (VD of air is 1.0) VD's greater than 1.0 tend to sink while VD's less than 1.0 tend to rise.

VD determines whether the agent is lighter or heavier than air, thus determining whether the agent will settle to low areas or float away and dissipate in the atmosphere. Agents with VD's less than 1.0 are almost invariably non persistent. They will quickly dissipate into the atmosphere.

Liquid/Solid Density (LD/SD)
The density of a chemical agent is the mass per unit volume of the substance. Because volume varies with temperature, a specified temperature should be given.

Liquid density is a measure of an agent's weight in comparison to water density (1.0). Agents with a specific gravity of less than 1.0 will tend to float on water while those with a value greater than 1.0 will tend to sink. However, sometimes-liquid density is not the only factor in attempting to make this determination. Solubility (miscibility) is the ability of an agent to dissolve in a given solution (usually water). Insolubility is the inability of an agent to dissolve in a given solution (usually water). Liquid/solid densities and solubility are major factors to consider when using water as a method of decontamination.

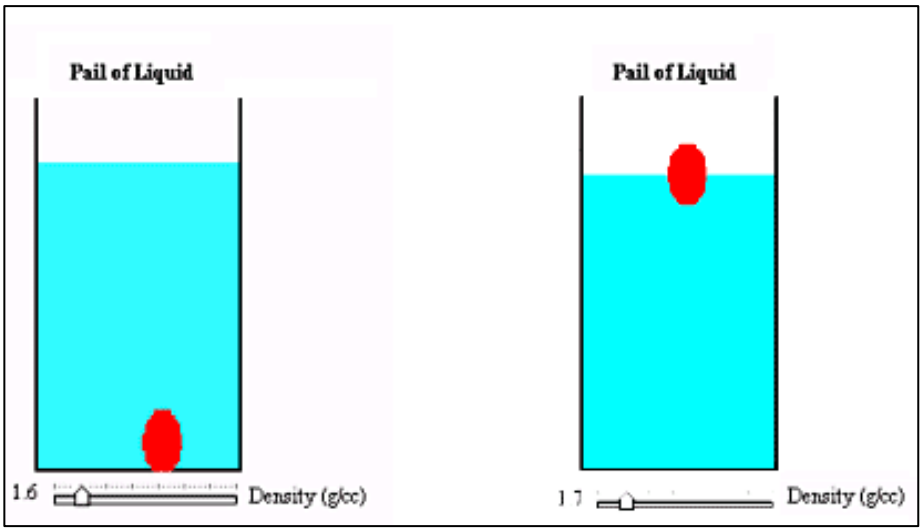


Figure 12-35

Freezing Point/Melting Point (FP/MP)
Freezing Point is the temperature at which liquid changes to a solid. Melting Point is the temperature at which a solid changes to a liquid.

Tabun (GA) melts at -5^0 C (23^0 F). How will the agent react if the temperature is -4^0 C and rising? Once it rises above its melting point, the agent will begin to volatilize more rapidly than when it was frozen. When the agent contacts a warmer object (such as the skin), the agent will melt, thus causing a contact hazard called secondary transfer. In addition, warming of a frozen agent upon entering an enclosure or area where the temperature is high enough will melt the agent causing a contact and vapor hazard. Below their freezing points, most agents become unreliable in creating casualties from direct effects. The effects usually come from secondary transfer.

Boiling Point (BP)
Boiling Point (BP) is the temperature at which the vapor pressure of a liquid equals the pressure of the gas above it. The normal boiling point is the temperature at which the vapor pressure of a liquid equals one atmosphere (atm). At high altitudes where the atmospheric pressure is less than one atm, water boils below 100 degrees Celsius (212^0 F).

The higher the boiling point, the more slowly a liquid evaporates at ordinary temperatures. Agents with low boiling points are usually non persistent and produce more vapor as the temperature rises. An example is Hydrogen Cyanide (AC), which has a boiling point of 25.7^0 C (75^{0}F). Agents with high boiling points are usually persistent. An example is VX, which has a boiling point of 298^0 C (above 500^0 F) Boiling points also provide insight into the volatility of an agent (how much will vaporize).

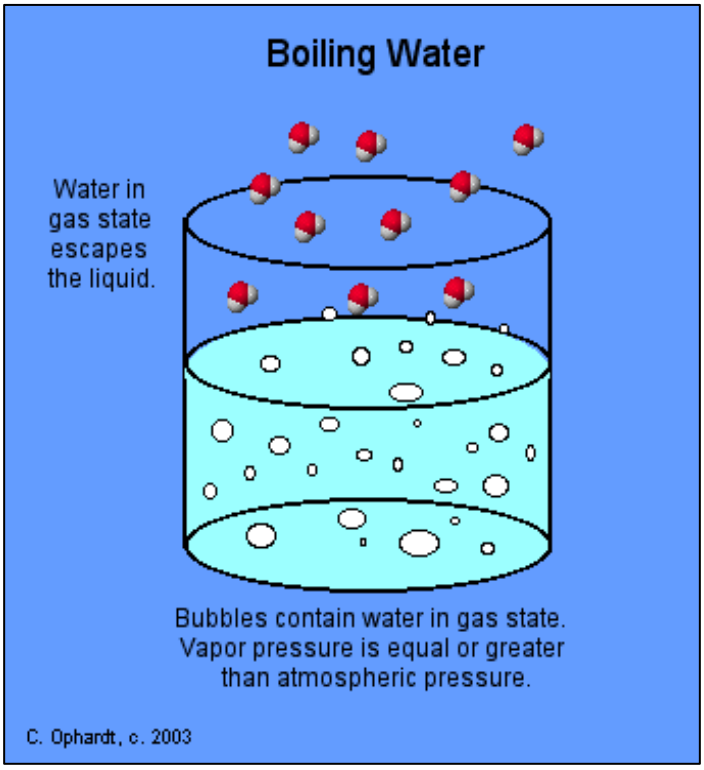


Figure 12-36

Vapor Pressure (VP)
Vapor Pressure (VP) is the pressure exerted by a vapor when a state of equilibrium exists between the vapor and its liquid (or solid) state is called its vapor pressure. It is the pressure in a closed space above a substance when no other gas is present. Vapor pressure varies with temperature, so the temperature should be stated. VP increases as temperature increases.

Vapor pressure is used to determine volatility of an agent. Substances with high vapor pressures evaporate rapidly, while those with low vapor pressure evaporate slowly. Agents with low boiling points have high vapor pressure. Agents with exceptionally high VP's are of limited use because they vaporize and dissipate too quickly.

Volatility (V)
Volatility refers to the tendency of a solid or liquid material to pass into the vapor state at a given temperature. The volatility depends of vapor pressure and varies with temperature.

Volatility is Expressed as milligrams of vapor per cubic meter (mg/m^3). Agents with low volatility tend to evaporate slowly. VX has a volatility of 10.5 mg/m^3 at 25^0 C and evaporates slowly. Agents with high volatility tend to evaporate rapidly. AC has a volatility of 1,080,000 mg/m^3 at 25^0 C and evaporates rapidly.

Flash Point (FlP)
Flash Point (FlP) is the temperature at which a liquid or volatile solid gives off sufficient vapor to form an ignitable mixture near the surface of the liquid.

Agents with low flash points usually burn when the munitions containing them burst.

Decomposition Temperature (DT)
Decomposition Temperature (DT) is the temperature at which a chemical breaks down into two or more substances.

Decomposition temperature can be used to evaluate candidate chemical agents. A low decomposition temperature (one that is markedly lower than the boiling point) will usually mean that dissemination of the agent will cause excessive decomposition.

Non-Persistent Agents

A non-persistent agent is a chemical agent that dissipates and/or loses its ability to cause casualties after 10 to 15 minutes after release. This term describes an agent that will not remain in the air for long. Some example of non persistent agents are:

- CG (Phosgene)
- DP (Diphosgene)
- GA (Tabun)
- GB (Sarin)
- GD (Soman, This agent has a lot of the same characteristics as a persistent agent.)
- GF (Cyclo-sarin)
- AC (Hydrogen cyanide)
- CK (Cyanogen chloride)
- SA (Arsine)
- CX (Phosgene-oxime)

Persistent Agents

A persistent agent is a chemical agent that retains its ability to cause casualties for more than 24 hours to several days or weeks after its release. This term describes an agent that will remain in the area for a very long time. Some example of persistent agents are:

- VX (o-ethyl methyl phosphonthiolate)
- Vx (v sub x)
- HD/H (Distilled mustard and levistein mustard)
- HN-1 (nitrogen mustard 1)
- HN-2 (nitrogen mustard 2)
- HN-3 (nitrogen mustard 3)
- HT (Mustard-T Mixture)
- L (Lewisite)
- HL (Mustard-Lewisite Mixture)
- PD (Phenyldichloroarsine)
- ED (Ethyldichloroarsine)
- MD (Methyldicholoroarsine)

For specific agents physical properties see AFTTP (I) 3-2.55 Chapter 2 and Appendix H

Dissemination Methods

We expect our potential enemies to use theater ballistic missiles. Many other methods exist to deliver chemical agents such as aircraft bombs, aircraft spray tanks, unmanned aerial vehicles, or improvised terrorist devices. The list of delivery methods is extensive. However, we consider TBMs as the primary delivery method for chemical warfare agents for several reasons.

TBMs (with conventional munitions warheads) successfully penetrated coalition air base defense systems during Operation Desert Shield/Storm. In addition, the chemical/biological payload of a missile may not be destroyed if it's intercepted by another defensive missile such as the Patriot missile.

Technological advances in US air defense systems minimize potential adversaries' capabilities to attack us by airframe. US air bases are generally far removed from the forward edge of the battle area and are therefore out of the range of other chemical warfare agent delivery methods suited for large area coverage. It is unlikely that small groups of enemy forces could effectively employ enough chemical mortars or rockets to cause a severe threat to air base operations.

Figure 12-37

Deposition Patterns and Droplet Size

The expected area of liquid contamination depends on the type of burst (air burst or surface burst), and the current weather conditions.

Today's threat documents state that an air burst results when the TBM detonates 150 feet to 1 mile above the earth's surface. In keeping with the simplified chemical plotting techniques, the airburst TBM can contaminate an area with liquid/solid contamination up to a 1.2-mile or a 2km radius circle around the center of the detonation point. The actual spread of liquid/solid contamination will be somewhat cigar shaped. The dimension of the contaminated area will be approximately 1,600 feet in width by 6,500 feet (1.2 miles) in length.

A surface burst results when the TBM detonates below 150 feet. Using the simplified chemical plotting techniques, a surface burst TBM can contaminate an area with liquid/solid contamination up to 0.62 of a mile (1km) radius around the center of the detonation point.

The expected hazard distance presented by the vapors traveling downwind from a liquid/solid chemical agent attack is not expected to be greater than 6.2 miles (10km). The vapor concentration will be greatest at the source and begin to decrease as you get further away from the liquid agent.

The worst-case vapor dosage from the time any chemical warfare agent is introduced into the environment to the time that it completely dissipates is a dosage of 4,500 mg-min/m^3 for an unprotected individual. This value is known as the worst-case vapor dosage from a single attack.

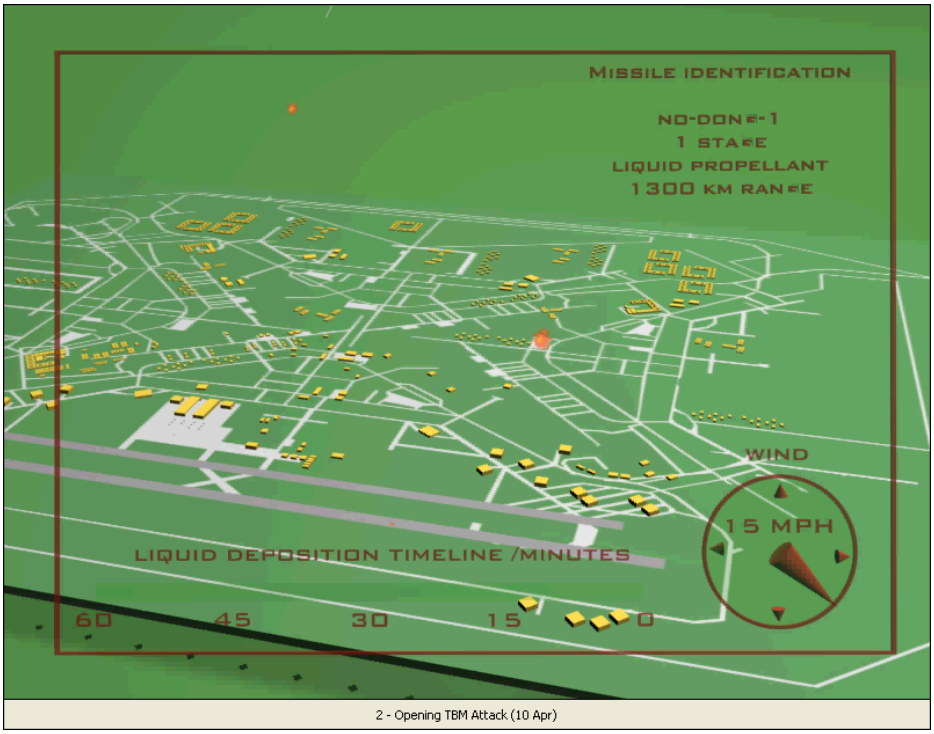


Figure 12-38

Split MOPP

A partially contaminated air base (Split MOPP): Based on the area of coverage you just studied, air base personnel could have a situation where only part of the air base is contaminated. It is possible that only the personnel in the area affected by chemical agents would have to wear protective equipment (given that the winds are blowing the chemical vapors away from the area of the base not affected by the chemical agent). The primary reason behind this line of thinking is to reduce the impact of chemical warfare agent attacks on our ability to launch and recover aircraft.

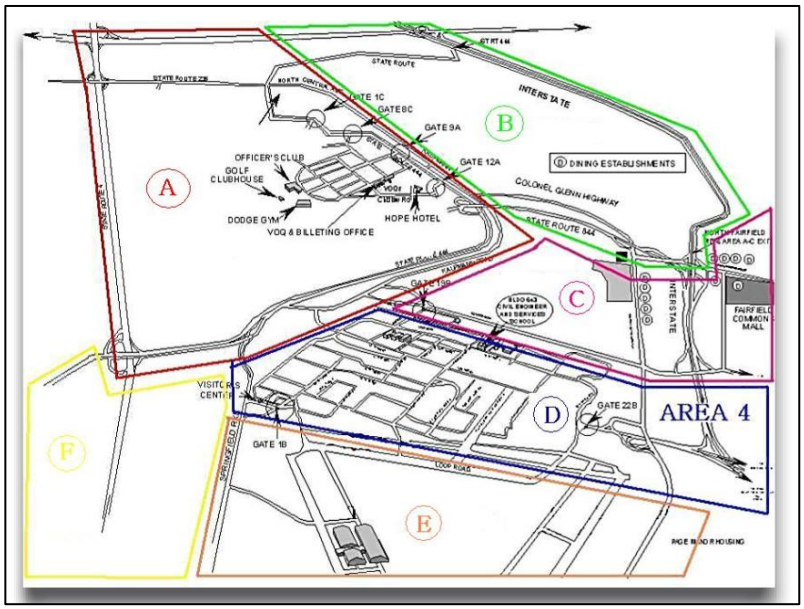


Figure 12-39

Planning Factors

The USAF planning factor for liquid ground contamination resulting from an enemy attack during general war is 5 grams per square meter (expressed as $5g/m^2$). Five grams equates to about 1 teaspoon of agent. In other words, the chemical agent will not be dripping from the trees!

A TBM will create a worst-case liquid droplet size, in diameter, of about 900 microns. A micron is one, one-thousandth ($^1/_{1000}{}^{th}$) of a millimeter. About seven sheets of paper stacked on top of one another will be 900 microns thick. The average droplet size would be about 200-250 microns.

See AFMAN 10-2602 pages 35-36 for an explanation of VX droplet sizes after an attack.

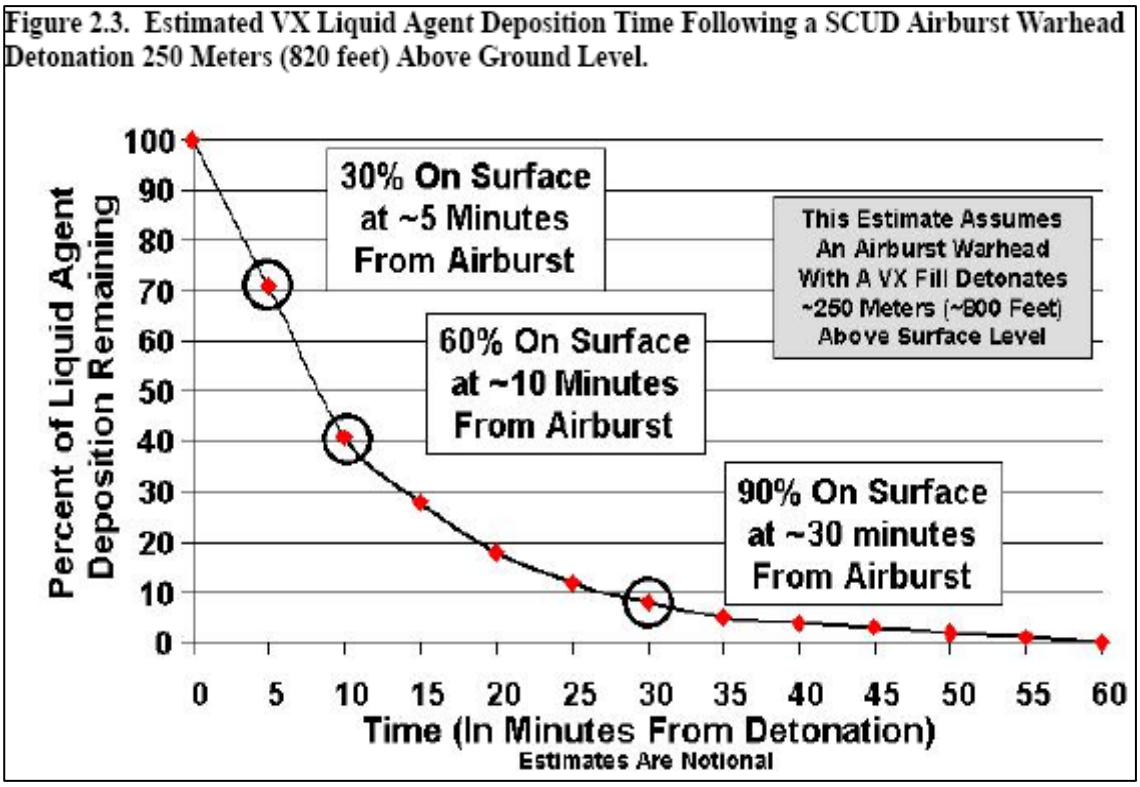


Figure 12-40

The expected size of agents in solid or dusty form is even smaller, approximately 2-15 microns. As a chemical reconnaissance team member it is important to understand the size of the agent droplets! You will have to look carefully in your hunt for ground contamination.

Incapacitating Levels (to include Miosis)

Dosage is the amount of substance administered (or received) per body weight. It is usually expressed as milligrams per kilogram (mg/kg) of body weight for liquid agents and as milligrams-minute per meter cubed (mg-min/m^3) for vapor exposure.

Median Effective Dosage (ED_{50}) of a liquid agent is the amount of liquid agent expected to cause some defined effect. (E.g. severe: collapse, convulsions; mild: inflammatory redness of the skin) in 50% of a group of exposed, unprotected personnel. (This refers only to skin absorption, not respiratory). It is expressed as mg/kg of body weight.

Median Effective Dosage (ECt_{50}) of a Vapor or Aerosol is the effective dosage of a chemical agent vapor that is sufficient to cause some defined effect in 50% of exposed, unprotected personnel for a defined MV and exposure duration. It is expressed as mg/m^3 x time = mg-min/m^3

When airborne vapor comes in contact with the eyes, miosis occurs as a result of a direct local effect of the nerve agent on the eyes and can occur prior to any inhibition of ChE in the blood. This type of exposure is frequently accompanied by tightness of the chest along with some or all of the other symptoms. In cases of nerve agent exposure not involving vapor contact with the eyes, miosis is one of the last effects to occur before death.

Specific toxicity estimates for agents can be found in AFTTP (I) 3-2.55 Chapter 2 and Appendix H.

Lethal Levels

Median Lethal Dosage (LD_{50}) of a liquid agent is the amount of liquid agent expected to kill 50% of a group of exposed, unprotected personnel. This refers only to skin absorption, not respiratory. It is expressed as mg/kg of body weight.

Median Lethal Dosage (LCt_{50}) of a Vapor or Aerosol is the amount of vapor or aerosol that is lethal to 50% of a group of exposed, unprotected personnel for a defined volume of air exchange in one minute (MV) and for a specific exposure duration. This can apply to both percutaneous and respiratory, or just respiratory, depending on the agent used. It is expressed as mg/m^3 x time = $mg\text{-}min/m^3$

Specific toxicity estimates for agents can be found in AFTTP (I) 3-2.55 Chapter 2 and Appendix H.

Interaction with Various Surfaces

Liquid chemical agents tend to cling to vegetation, increasing the area for contact and evaporation. Because of low wind speeds and reduced temperatures, heavily wooded and jungle areas retain vapors longer.

Toxic liquids quickly soak into porous surfaces and evaporate more slowly than from nonporous surfaces. This increases the duration of any vapor hazard, although it reduces vapor cloud concentration.

Liquid Hazard Tables
(This information can be found in the HQ AFCESA NBC Detection Guide pg. 9-11)

These tables are estimates of agent hazards based upon a combination of field test data and modeling techniques. Use all available field detectors and hazard prediction models to determine the likely residual hazard that remains after field detectors read zero. The BEE and CE readiness personnel must balance their recommendation for MOPP reduction or increase based upon the available models, weather condition and mission criticality as determined by the responsible commander.

Guidelines for using the liquid hazard tables: The liquid hazard table includes results from temperatures between –5 degrees and 50 degrees C. Times used in the table are represented in hours (e.g. 0.1=6 minutes, 0.5=30 minutes, 0.9=54 minutes, etc.) The table includes data for sixteen surfaces, any of which could be present on an airbase. The times are listed for Tabun (GA), Sarin (GB), Soman (GD), Cyclosarin (GF), Distilled Mustard (HD), Russian VX isomer (R-33) and VX. An entry of "0" in a cell means that the contamination density is below the toxicology standard of either 100% transfer from the surface, or below the level reported to be transferred by the experimental literature.

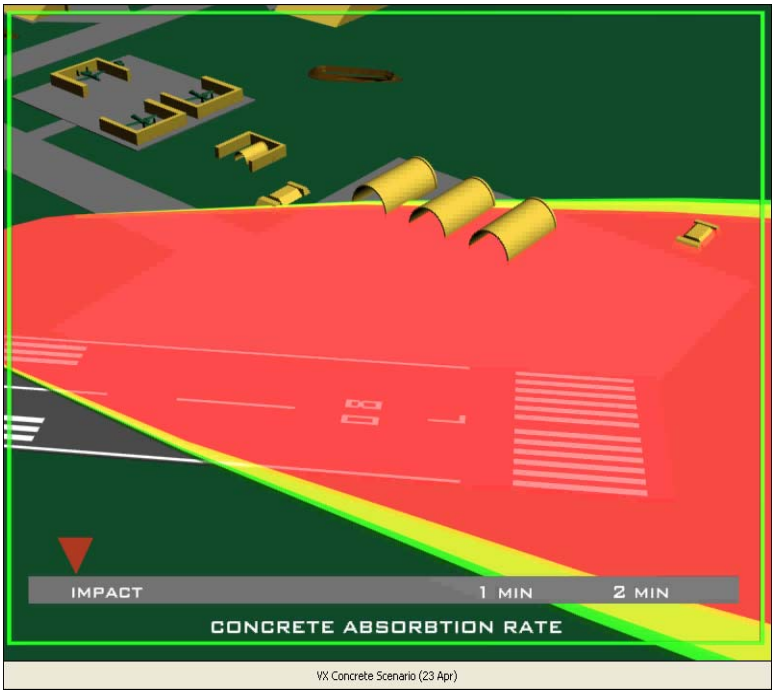


Figure 12-41

Refer to Table A2.1 (pg. 10) in the HQ AFCESA NBC Detection Guide.

Vapor Hazard Duration Tables

Note: (This information can be found in the HQ AFCESA NBC Detection Guide pgs. 12-74)

The tables within attachment 3 of the HQ AFCESA NBC Detection Guide provide the vapor hazard estimates for GA, GB, GD, GF, HD, R33, and VX. These tables include expected hazard times for the seven primary operating surfaces found on airbases that contribute to area vapor hazard (e.g. asphalt, bare ground, concrete, grass, sand, sandy loam and tar and chip). Other surfaces, such as glass and bare metal, represent a very small percentage of the surface area on a base and are not expected to

impact the area vapor hazard; however, they could present a local hazard for personnel working directly within close proximity to them. In these cases, personnel should use the 10-foot rule.

Guidelines for using vapor hazard duration tables: The tables list predicted times a chemical agent remains a vapor hazard at temperatures of –5, 10, 25 and 50 degrees C. When using a temperature between the listed values, use the higher temperature values to quickly determine the worst case. Release altitude is listed as either low (20 meters to 250 meters above ground level (ABL)) or high (over 1000mters AGL). Multiple delivery types and various meteorological conditions were examined for each agent and surface combination. Air stability is listed as either PSC D (Stability category of 1-4) or PSC F (Stability category of 5-7). Wind speed is represented as 2, 6, or 10 knots. If weather conditions do not match within +/- 2 degrees C and +/- 1 knot from values listed, select the weather parameters most consistent with projected environmental conditions.

The tables include four data sets:

- Time Vapor Hazard causes lethal effects in 16% of the population exposed (LCt 16)
- Time Vapor Hazard causes mild effects (e.g. miosis) in 16% of the population exposed (ECt 16)
- Times M-22 ACADAs detect the presence of a Vapor Hazard based upon their threshold sensitivities.
- Times CAMs/ICAMs detect the presence of a Vapor Hazard based upon their threshold sensitivities.

Refer to Table A3.1. (pg. 12) in the HQ AFCESA NBC Detection Guide for the vapor hazard table lookup chart.

Refer to Table A3.6. and A3.7. (pg. 17) for helpful tools when using the vapor hazard charts.

For a list of specific reactions between chemical warfare agents and metal see AFTTP (I) 3-2.55, Appendix G

12. Expeditionary and Contingency Operations

j. Given applicable references, describe facts about protective measures for chemical warfare agents with at least an 80% accuracy. STS: 12.1.6., 12.4.4.2.

PROTECTIVE MEASURES FOR CHEMICAL AGENTS

This objective will cover MOPP analysis factors.

MOPP Analysis Factors

The best way to protect against potential CB threats is through the use of Individual Protective Equipment and Mission Oriented Protective Postures (MOPP). There are 5 MOPP level (MOPP 0-4) and 3 MOPP options (Mask only, ventilation, and no BDU or flight suit option). Commanders decide on any MOPP level or option with the advise of the readiness flight.

MISSION-ORIENTED PROTECTIVE POSTURES (MOPP)

MOPP LEVEL 0	MOPP LEVEL 1	MOPP LEVEL 2	MOPP LEVEL 3	MOPP LEVEL 4
AVAILABLE FOR IMMEDIATE DONNING	WORN	WORN	WORN	WORN
INDIVIDUAL PROTECTIVE EQUIPMENT (IPE)	OVERGARMENT AND FIELD GEAR	OVERGARMENT, OVERBOOTS AND FIELD GEAR	OVERGARMENT, PROTECTIVE MASK, HOOD, OVERBOOTS AND FIELD GEAR	OVERGARMENT, PROTECTIVE MASK, HOOD, GLOVES, OVERBOOTS AND FIELD GEAR
CARRIED	CARRIED	CARRIED	CARRIED	CARRIED
PROTECTIVE MASK WITH C2 CANISTER OR FILTER ELEMENTS AND HOOD INSTALLED, FIELD GEAR WORN WHEN DIRECTED	OVERBOOTS, PROTECTIVE MASK AND GLOVES	PROTECTIVE MASK AND GLOVES	GLOVES	
PRIMARY USE	PRIMARY USE	PRIMARY USE	PRIMARY USE	PRIMARY USE
PRE-ATTACK DURING PERIODS OF INCREASED ALERT WHEN THE ENEMY HAS A NUCLEAR, BIOLOGICAL, OR CHEMICAL (NBC) OFFENSIVE CAPABILITY THERE IS NO INDICATION OF NBC USE IN THE IMMEDIATE FUTURE	PRE-ATTACK DURING PERIODS OF INCREASED ALERT WHEN AN NBC ATTACK COULD OCCUR WITH LITTLE OR NO WARNING WHEN NBC CONTAMINATION IS PRESENT OR SUSPECTED AND HIGHER LEVELS OF PROTECTION ARE NOT REQUIRED	PRE-ATTACK OR POST-ATTACK DURING PERIODS OF INCREASED ALERT WHEN AN NBC ATTACK COULD OCCUR WITH LITTLE OR NO WARNING WHEN NBC CONTAMINATION IS PRESENT OR SUSPECTED AND HIGHER LEVELS OF PROTECTION ARE NOT REQUIRED	PRE-ATTACK OR POST-ATTACK DURING PERIODS OF INCREASED ALERT WHEN AN NBC ATTACK COULD OCCUR WITH LITTLE OR NO WARNING WHEN NBC CONTAMINATION IS PRESENT OR SUSPECTED AND HIGHER LEVELS OF PROTECTION ARE NOT REQUIRED	POST-ATTACK WHEN AN NBC ATTACK IS IMMINENT OR IN PROGRESS WHEN NBC CONTAMINATION IS PRESENT OR SUSPECTED OR THE HIGHEST LEVEL OF PROTECTION IS REQUIRED

ADDITIONAL INFORMATION
- IPE INCLUDES THE GROUNDCREW CHEMICAL ENSEMBLE AND FIELD GEAR. CARRY M8 AND M9 PAPER, THE M291 AND M295 DECONTAMINATION KITS, AND NERVE AGENT ANTIDOTES IN MOPPS 1-4. REFER TO *AFI 10-2501, FULL SPECTRUM THREAT RESPONSE PLANNING AND OPERATIONS*, FOR IPE COMPONENTS AND BASIS OF ISSUE.
- DEPENDING UPON THE THREAT AND MISSION, MOPP LEVELS MAY VARY WITHIN DIFFERENT AREAS OF THE AIRBASE OR OPERATING LOCATION.
- REFER TO AFMAN 10-2602, *NUCLEAR, BIOLOGICAL, CHEMICAL AND CONVENTIONAL (NBCC) DEFENSE OPERATIONS AND STANDARDS*, FOR OPTIONS TO THE MOPP LEVELS AND TACTICS, TECHNIQUES AND PROCEDURES TO OPTIMIZE THE USE OF MOPP LEVELS AND ALARM CONDITIONS.
- WEAR FIELD GEAR AND PERSONAL BODY ARMOR (IF ISSUED) WHEN OUTDOORS OR WHEN DIRECTED.
- SPECIALIZED CLOTHING, SUCH AS RAIN AND COLD WEATHER GEAR, IS WORN AS THE OUTSIDE LAYER OF CLOTHING OVER THE GROUNDCREW CHEMICAL ENSEMBLE.

Figure 12-42

The projected threat environment at an airbase will not always call for extended MOPP 4 conditions. During the pre-attack phase, Civil Engineer Readiness personnel can use intelligence information and current weather conditions to provide detailed information on protection requirements and predict agent persistence. Medical personnel can provide recommendations to ensure safe and sustained operations under various climatic conditions. The commander and staff should use this information to develop standard responses and courses of action for each primary airbase mission. After an attack, Civil Engineer Readiness personnel will use the information collected from base and unit PAR teams to identify the type of agents used, the likely duration of exposure,

and minimum protection requirements. The commander and staff can then determine what courses of action to employ. Civil Engineer Readiness technicians can further assist the commander to determine risk and assist units develop threat-based courses of action.

Mission Continuation in a Contaminated Environment

Most, if not all, airbase missions can be done in contaminated environments if the base populace is well trained and leadership understands the threat environment. Through a combination of training and leadership, all mission essential tasks can be completed while wearing IPE or using approved MOPP options. Most senior leaders know they cannot expect the same work rates in MOPP 4 as they achieved in MOPP 0. They must re-evaluate their ability to meet mission requirements and communicate changes to their forces. Depending on the task and climate, the short and long-range consequences to personnel may range from insignificant (cool or mild conditions) to catastrophic (hot and dry conditions).

Table A5.2. Work-Rest Cycles and Fluid Replacement Guidelines.

Heat Category	WBGT[1] Index (°F)	Light (Easy) Work		Moderate Work		Hard (Heavy) Work	
		Work/ Rest[2]	Water Intake[3] (Quart/Hour)	Work/ Rest[2]	Water Intake[3] (Quart/Hour)	Work/ Rest[2]	Water Intake[3] (Quart/Hour)
1	78-81.9	NL[4]	1/2	NL	3/4	40/20 min	¾
2	82-84.9	NL	1/2	50/10 min	3/4	30/30 min	1
3	85-87.9	NL	3/4	40/20 min	3/4	30/30 min	1
4	88-89.9	NL	3/4	30/30 min	3/4	20/40 min	1
5	>90	50/10 min	1	20/40 min	1	10/50 min	1

Figure 12-43

There will be situations--especially in high heat conditions-- where the mission cannot be accomplished within required times because of the IPE degradation. MOPP options can be used to extend operations, but they are not the solution for every situation. It is important commander's to use work rest cycles when making MOPP decisions. When contamination is present, the commander must be prepared to choose between mission accomplishment or agent effects on personnel. The decision may be relatively minor and focus on a single mission or function or affect large segments of the airbase. Commanders should prepare for these situations during the pre-attack phase by training the staff to quickly develop alternate courses of action for likely post-attack scenarios. When faced with decisions, the staff will be prepared with the information the commander needs to select a course of action.

MOPP reduction decisions are among the most difficult to make because of the many considerations that affect the final decision. Commanders must evaluate the situation

from both the airbase survivability and mission perspective. Factors include the criticality of the current missions, the airbase contribution to theater war plan execution, detector capabilities, potential effects of personnel exposure, and the impact on the casualty care system. Courses of action should consider the likely trade-offs between short- or intermediate-term results and the intermediate and long-term effects on airbase mission sustainment.

12. Expeditionary and Contingency Operations

k. Given applicable references, describe facts about chemical agent detection capabilities with at least an 80% accuracy. STS: 12.4.5.

CHEMICAL AGENT DETECTION

This objective will cover the capabilities of M8 paper, M9 paper, M256A1, M22 and CAM/ICAM as well as cover their threshold sensitivities.

Detection Capabilities

The Air Force Readiness Flight uses 5 primary pieces of detection equipment. M8 Paper detects G, V and H agents in liquid form and identifies the agents as G,V,H using a color coded chart. The response time in normal temperature conditions is less than 30 seconds. M9 Paper detects G, V, H agents in liquid form but does not identify specific agents. The response time is less than 30 seconds in normal temperature conditions. The M256A1 kit is a vapor detector that detects G, VX, HD, L, CX, AC and CK. For identification it identifies the agent as either nerve, blood or blister agent. The response time in normal temperature conditions, if the whole kit is run, is 20 minutes. The M22 is a vapor detector that can be used for area detection. It detects GA, GB, GD, GF, VX, H and L. It will identify the agent by categorizing it as nerve or blister agent. The response time ranges between 30 seconds to 2 minutes. The CAM/ICAM is a vapor point monitor that monitors GA, GB, GD, VX, HD and HN. It identifies agents by categorizing it as nerve or mustard. The response time is usually under 1 minute.

Detector or Monitor	Agent Form	Detection	Identification	Response Time
M8 Paper	Liquid	G, V, H	G, V, H	< 30 seconds
M9 Paper	Liquid	G, V, H	None	< 30 seconds
M256A1*	Vapor	G, VX, HD, L, CX, AC, CK	Categorizes as nerve, blood or blister	20 minutes
M22	Vapor	GA, GB, GD, GF, VX, H, L	Categorizes as nerve or blister	30 secs to 2 minutes
CAM/ICAM	Vapor	GA, GB, GD, VX, HD, HN	Categorizes as nerve or mustard	< 1 minute

Figure 12-44

AFMAN 32-4017 has a chart reflecting the threshold sensitivity levels for Air Force fielding detection equipment.

Equipment	US AIR FORCE CHEMICAL AGENT DETECTOR THRESHOLD SENSITIVITY (In mg/m^3 unless otherwise noted)						
	GA	GB	GD	GF	VX	HD	L
M256A1[1]	0.005	0.005	0.005	0.005	0.02	2.0	9.0
CAM[2]	0.1	0.1	0.1	*Note 3*	0.1	0.1	N/A
ICAM[2]	0.1	0.1	0.1	*Note 3*	0.1	0.1	N/A
M22 ACADA[2]	0.1	0.1	0.1	0.1	0.04	2.0	2.0
M8 PAPER[4]	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops
M9 PAPER	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops	100-u drops

NOTES:

1. M256A1 data was provided by the US Army SBCCOM, Ms. Tuan Pham (PhamT@ria.army.mil). These numbers are valid across the equipment operating temperature/humidity spectrum and are therefore safe sided. Antidotal evidence shows increased sensitivity response in the 20-22°C >10 %humidity range.
2. Sensitivity data for the CAM/ICAM/M22 were derived from the equipment Operational Requirements Document and provided by the US Army Program Managers, Louis Kosydar (louis.kosydar@us.army.mil) DSN 584-2147, and Roger Griffin DSN 584-2112.
3. GF was not an agent of requirement at the time of CAM/ICAM development; however, most ion mobility spectrometry detectors, such as the CAM/ICAM that are programmed for other G agent should alarm to GF. Specific test results to quantify GF sensitivity are not available. This information was provided by US Army SBCCOM, Thomas Mitchell (thomas.mitchel@us.armyy.mil, DSN 584-5632) and verified by the US Army Program Manager, Louis Kosydar.
4. M8 paper sensitivity is based upon US Army Dugway Proving Ground Document DPG/JOD-91/010, *CB Technical Source Book, Volume XIII, Detection, Identification and Warning. 26 Aug 91.*

Figure 12-45

12. Expeditionary and Contingency Operations

I. Given applicable references, describe facts about performing wartime tasks in a chemically contaminated environment with at least an 80% accuracy. STS: 12.4.6.

PERFORMING WARTIME TASKS IN A CHEMICAL ENVIRONMENT

This objective will cover toxic agent training overview, tentative training schedule and pre-training requirements and pre-training review requirements

Chemical Defense Training Facility (CDTF)

Toxic agent training is provided to give students a realistic experience operating in an actual contaminated environment. Students will be expected to detect, identify and decontaminate actual nerve agents Sarin (GB) and O-ethyl methyl phosphonothiolate (VX). Students will also be evaluated on using detection and decontamination equipment such as M8 Paper, M9 Paper, M256A1 Kit and the M291 kit. Students will also have the opportunity to operate and observe the CAM/ICAM, M22, NAAK and the decontamination solution HTH while undergoing training.

Tentative Training

The following is a tentative Training Day schedule, these time can be altered or affected by a numerous amount of things. This is by no means set in stone.

0600	Pick up
0630	Check in with security guards at CDTF
0645	CDTF Inbrief and video
0715	Medical briefing
0745	Odor sensitivity test
0815	Medical screening and blood draw
0900	Mask issue and Mask fit validation test
0930	Site model tour
0940	Uniform and protective overgarment issue
0945	Locker room brief and dress out
1010	Advanced scenario issue
1040	Mask check
1050	Hot area advanced training scenarios
1230	Doff out
1245	Hygienic shower and dress
1300	Critique and out-brief
1330	Drop off

Pre-Training Requirements

The following letter is given to all students prior to training to ensure they meet the requirement for training at the CDTF. Once at the in-residence course this letter will require signature prior to training.

The following requirements for training at the Chemical Defense Training Facility (CDTF) are provided to help prepare students for toxic agent training. Due to the fact that training employs the use of nerve agents, adherence to these requirements is mandatory. Failure to adhere to these requirements can result in student dismissal from CDTF training.

Students must have in their possession a valid, DoD-issued ID card, whose name and social security numbers match what is shown on the entry control roster, in order to be allowed on site.

Prohibited items brought to the CDTF will be collected by security personnel when presenting your ID card for entry. These items may be retrieved when leaving the CDTF at the conclusion of training. Possession of prohibited items beyond the security checkpoint can result in removal from the site and dismissal from training. Prohibited items include, but are not limited to:

Cameras, Cell Phones, Pagers, PDAs, Mints, Tobacco Products, Fire Arms, Knives, Alcohol, Lip Gloss, Multi-Tools, Tools, Chewing Gum, Candy, Briefcases, Computers, Purses, Bags

Due to the fact that training continues through the lunch hour without a break, all students must eat breakfast prior to arrival on site. Failure to do so will preclude them from training. Neither food nor drink (except water) will be consumed on site before training is complete. Students may bring MREs or “Jimmy Dean” meals to consume after training. For safety and physical well being during training, students are highly encouraged to refrain from alcohol consumption 24 hours prior to training.

To ensure an effective protective mask fit validation test, students (US and International) must be cleanly shaven (regulation mustache is permitted) and students must not use any tobacco products 15 minutes prior to entering the site. Students will not be allowed to train while wearing nail polish/nail extensions, hair extensions, beads, or any artificial devices attached to their person. These items must be removed prior to arrival at the CDTF. The only exceptions to this rule are medically required dentures and appliances. Notify the CDTF staff in advance if you have these appliances.

Students will refrain from wearing any perfume, cologne, or aftershave.

Any personal items (i.e. watches, rings, jewelry, hair clips, clothing items, etc.) taken into the toxic agent training area will be confiscated and decontaminated to 5X level (1000 degree incineration). These items cannot be returned to the student.

Contact lenses are prohibited at the CDTF. Students must bring their regular eyeglasses for use prior to and after toxic agent training, as well as a serviceable pair of optical inserts for use during training. Advanced student will need to bring with them to the in-residence course both MCU2A/P and M40A1 inserts, if the students do not have required eyewear they will have the opportunity to order them while at fort Leonard wood. Students will not be allowed to enter the toxic training areas unless they have at least 20/40 vision near and far (in at least one eye), uncorrected or corrected with optical inserts. Rule of thumb: if you need glasses for distance or for reading, bring a pair of optical inserts with you.

If a student is on any form of medical profile or medical restriction, the student must hand-carry a copy of the profile/restriction with them to the CDTF on the day of training. Failure to do so can result in dismissal from training. Students who have revealed past or present suicidal ideations may not train without the approval of the Commander, 3rd CM Brigade. This approval must be obtained by the unit in writing and submitted to the CDTF NLT two days prior to training. All profiles and medical documentation will be presented to the CDTF medical staff. Tattoos or piercing(s) that are less than one week old may disqualify a student from training, pending medical evaluation by the medical staff. Students must alert CDTF medical staff to these conditions. Students are encouraged to refrain from taking over-the-counter medications if possible. Students should continue taking prescription drugs as required.

A pre-training blood draw is required of all students. On occasion, a post-training blood draw may be required. All non-Department of Defense and international students require two pre-training and one post-training blood draw. Failure to obtain the required blood draws at the appropriate time will prevent the student from training or receiving credit for the training.

The following information is provided as a courtesy notification to students that they will be observed as they process through decontamination showers. After being separated by gender, students will undergo a period of observed nudity as they process through the “hot-area” shower only. This period lasts no more than thirty seconds and there will be no allowances made for privacy. The purpose for the observation is to ensure students adhere to safety requirements.

If there are any questions regarding these instructions, bring them to the attention of an instructor. Instructors can be reached at fort Leonard wood by calling DSN: 676-7575 or Commercial 1-573-596-0131 ext 37575. The CDTF is a requirement that must be met in order to graduate; no different than a Block Test.

Pre Training Review Requirements

Students will be expected to know how to operate detection equipment and know basic reconnaissance information. The following references should be reviewed prior to coming to the in-resident course:

AFTTP (I) 3-2.44, Multi-service tactics, techniques and procedures for NBC reconnaissance (review AF recon techniques to include sampling procedures and chain of custody)

11H2-2-21, M9 paper

11H2-23-1, M22

14P3-1-141, GCE

11H2-14-5-1, M8 paper

11H2-21-1, M256A1

11D1-1-131, M291

11D-3-11-1, M295

12. Expeditionary and Contingency Operations

m. Given applicable references, describe facts about Joint, Combined, and Coalition operations with at least an 80% accuracy. STS: 12.6.1.1.2., 12.6.1.1.3., 12.6.1.1.4.

JOINT, COMBIND AND COALITION OPERATIONS

This objective will cover: Joint CBRNE Control Center operations, NATO CBRNE organization and theater specific CBRNE organization.

Joint CBRNE Control Center Operations

Using more than one service, for example Army or Navy, to conduct operations is called joint operations.

Figure 12-46

National military strategy directs, current global security demands, and reality requires that the Armed Forces be prepared to conduct the full range of military operations in concert with the militaries of other nations. Combined or Coalition Operations is an ad hoc arrangement between two or more nations for common action.

Joint doctrine gives combatant commanders two specific CB warning and reporting responsibilities. The first is to verify enemy first use of CB weapons for the National Command Authorities. The second is to inform US forces, allies, and friendly governments of the impending or actual use of CB weapons by an enemy, along with US defensive measures to counter such use

For functional and operational reasons, the AOR of the NATO, USA, USAF and USN forces overlap. In addition, the AOR of the USA, civil defense and forces not assigned to the NATO may overlap or even be identical. NBC reports will inevitably be duplicated, particularly in the case of a nuclear detonation. Therefore, commanders at all levels must ensure that their plans are fully coordinated with all neighboring CBRN centers in order to avoid duplication of reports and to ensure the rapid and efficient exchange of the useful CBRN information. CBRN warning and reporting plans must be available and must state the requirement for the NBC reports to be submitted between units.

NATO CBRN Organization

NATO has established the following NBC Warning and Reporting Areas:

Nuclear, Biological, Chemical Area of Observation, which is a geographical area consisting of several nuclear, biological, chemical zones of observation, normally equal to a country. Large countries may be divided into more nuclear, biological, chemical areas of observation. When operating in areas where the nuclear, biological, chemical area of observation is not defined beforehand, the area must be defined and agreed to by the involved commands.

Nuclear, Biological, Chemical Zone of Observation, which is a geographical area which defines the responsibility for collecting and reporting information on enemy or unidentified nuclear detonations, biological or chemical attacks, nuclear, biological and chemical releases other than attacks, and resulting contamination. Nuclear, biological, chemical zones of observations must cover the geographical area defined by a nuclear, biological area of observation.

Inside these areas and zones, the following NBC functions will be established as NBC Warning and Reporting Centres:

- Source Level.
- NBC Sub Collection Centres (NBC SCC).
- NBC Collection Centres (NBC CC).
- NBC Zone Control Centres (NBC ZCC).
- NBC Area Control Centres (NBC ACC).

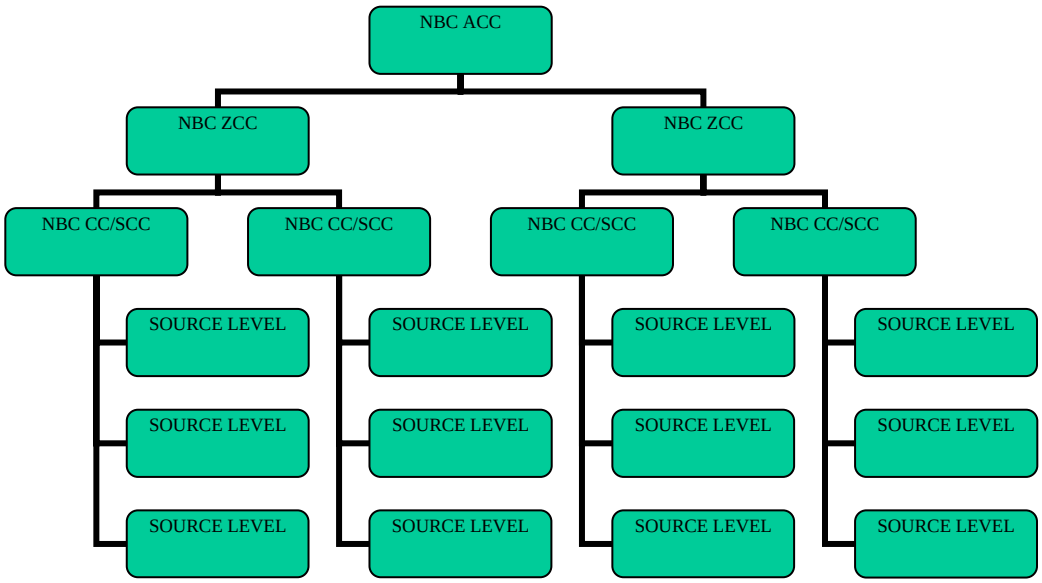


Figure 12-47

Theatre Specific CBRN Organization

Theater Level CBRN cells must have an appropriate number of personnel equipped, trained, and qualified to perform the tasks listed below efficiently:

- Assess the status and capability of the friendly units operating in the CBRN environment.
    - The CBRN control center evaluates the impact of the CBRN contamination on the tactical operations.
    - The CBRN control center may then recommend the type and quantity of supplies and equipment required to support the decontamination operations
- Maintain status and coordination of the CBRN support (i.e., decontamination or reconnaissance units).
    - When information in the AOI is inadequate, the CBRN control center, in cooperation with the appropriate support elements, recommends the locations for conducting the surveys.
- The CBRN control centers at this level may also be responsible for the organization and implementation of the sampling, identification, and evacuation of the CB agents.
- Transmit CBRN warnings to the adjacent HQ and to the military and civilian agencies when the predicted hazard areas extend beyond the area of responsibility
- Organize and coordinate the CBRNWRS within the AOs.
- Track information on the enemy CBRN activities.
- Make final filtering and correlation of the CBRN incidents within the AO.

It is important to remember that each theater is different according to their mission and doctrine.

12. Expeditionary and Contingency Operations

n. Given applicable references, describe facts about monitoring passive defense measures with at least an 80% accuracy. STS: 12.6.1.2.5.

MONITORING PASSIVE DEFENSE MEASURES

This objective will cover: General guidelines, passive defense measures, pre-attack actions, trans-attack actions and post-attack actions.

General Guidelines

Measures taken without engaging enemy forces to reduce the probability of and to minimize the effects of damage caused by hostile action are called passive defense. One of your roles in the CBRNE Control Center is to monitor passive defense measures for the base -- beginning in the planning process. Plans must be written to support passive defense measures based on the current threat
and implemented in a proper and timely manner.

Passive Defense Measures

Hardening

It is important to balance the level of hardening with the type of protection needed. Use the threat to determine the type of protection required. Permanent and expedient hardening measures are used to strengthen buildings and utility systems or provide barriers to resist the destructive effects of weapons. Successful hardening measures will protect people and weapons systems from primary and secondary weapons effects. Permanent hardening may be incorporated into structures during initial construction or added later as a modification or retrofit. Expedient hardening, such as rapid construction of sandbag walls or building soil berms, is the primary hardening method for expeditionary forces.

The selection of specific hardening measures will depend upon the threat, facility construction, type of vehicle or equipment to protect, and available resources. In general, the most cost effective method is to include hardening requirements into new facility construction or initial force bed down requirements during peacetime. Expedient hardening methods provide increased protection for expeditionary forces but require a significant commitment of manpower, specialized equipment and material. At the lowest level, units and airmen construct expedient bunkers, earth berms, sandbag walls, fighting positions and foxholes to protect people and resources.

Some different types of hardening are: Hardened, Semi-hardened, Splinter protected, Expedient hardening.

A hardened structure allows the occupant, systems and supporting infrastructure to continue to operate during and after attacks. The structures may include a Class I collective protection systems and typically are constructed below ground level and under rock or concrete cover. These structures provide substantial protection against direct attacks with current and projected chemical, biological and conventional weapon threats for that location. They provide complete protection against direct and indirect small arms fire. They also provide protection against the collateral effects (blast, heat, fallout, radiation, electromagnetic pulse) of nuclear weapons when combined with standard DoD force protection measures. Hardened structures provide the highest level of facility protection for wartime operations. For a picture of a hardened structure refer to AFMAN 10-100 PG. 60.

Semi-hardened structures allow the occupants, systems and supporting infrastructure to survive attacks and continue to operate immediately following attacks. They may be constructed at or below ground level and include Class II or better collective protection systems. These structures provide protection against the collateral effects (blast, heat, broken glass/glass shards, fragmentation, shock and contamination) of attacks with current and projected chemical, biological and conventional weapon threats for that location. They provide complete protection against direct and indirect small arms fire. They also provide limited protection against the collateral effects of nuclear weapons. When combined with standard DoD force protection measures, these structures provide a high level of protection for wartime operations. For a picture of a semi-hardened structure refer to AFMAN 10-100 pg. 61.

Use splinter protection to protect structures, people and resources. When combined with standard DoD force protection measures, these structures provide a moderate level of protection for wartime operations. Splinter protection allows the occupants to survive attacks and limits damage to systems, supporting infrastructure and resources. It limits the collateral effects (blast, heat, fragmentation, and shock) of conventional weapon attacks. It also provides limited protection against direct and indirect small arms fire and provides limited protection against the collateral effects of nuclear weapons. Splinter protected structures may include collective protection. For a picture of splinter protection refer to AFMAN 10-100 pg. 61.

Expedient hardening includes both standard and non-standard hardening techniques. Improvisation is often required to compensate for the lack of traditional construction materials or specialized equipment. Use expedient methods to take advantage of available local materials and terrain features. These methods are suitable for expeditionary operations and are effective against a wide range of airbase threats. Most methods require only a simple

analysis and plan. Unit personnel with minimal training can accomplish expedient hardening. Recognize that the most effective hardening measures may not be best to employ under every situation. Once the threat is identified, prepare a prioritized list of resources to protect. Consider factors such as the estimated construction time, manpower and equipment availability, life-span requirement and availability of materials. Implement specific actions based on these considerations and the decision of the senior Air Force commander. For an example of expedient hardening refer to AFMAN 10-100 pg. 62.

Dispersal

Dispersal is the spreading out of critical assets to maximize their survival. When doing this make sure you take advantage of natural cover. Distribute and hide critical resources outside of the effective range of shoulder-fired weapons that enemy ground forces may possess and not along the perimeter. When possible, disperse assets in or near the work area they'll support.

Ideally, each dispersal site should have at least two entry/exit routes on concrete or asphalt (if possible, due to rapid chemical agent sorption rates on these surfaces). Don't bunch vehicles up into one area. Disperse more than just vehicles. Also disperse equipment, tires and other critical supplies. In medium and high CBRNE threat areas, disperse with overhead cover and use reinforced facilities when available. Effective dispersal reduces the odds of contamination and damage.

Vehicle Dispersal is a valuable asset protection technique. The probability is high that effective dispersal will protect some vehicle assets from contamination or damage from conventional weapons effects. However, use dispersal actions with expedient hardening and overhead cover whenever possible. Additionally, vehicle operations personnel must guard against the tendency to park a large number of vehicles at any one location due to the ease of access.

When identifying or constructing dispersal sites, choose a combination of features that provide the best available expedient or natural protection and support mission needs. Locate the site in an area that is not within the effective range of adversary ground force weapons. If possible, locate the site on a concrete or asphalt surface. Enhance protection by locating the dispersal site in an area that is under the direct observation or control of a security forces defensive fighting position or an owner-user security checkpoint. To simplify retrieval and post attack reconnaissance tasks, place the site near a unit work area.

CBRNE Defense Training

It is vital the people on the installation know which actions to take in a contaminated environment. CBRNE Defense Training is used to identify items or procedures particular

to your base. Task Qualification Training can also be a useful training tool. TQT Information can be found in AFI 10-2501 and AFMAN 10-2602, attachment 4.

Pre-Attack Actions

Some pre attack actions that can be accomplished to monitor for passive defense measures are:

- Recall forces
- Verify the procedures and timelines for how the airbase receives theater missile, aircraft, and ground forces attack warning
- Review airbase-warning signals and alarm conditions.
- Develop command and control systems procedures to rapidly receive notice of TBM launch
- Activate CBRNE specialized teams.
- Develop and implement an airbase Ground sector and CBRNE zone plan.
- Implement the airbase protective shelter plan.
- Disperse and protect .
- Establish a UXO holding area.

Trans-Attack

Some trans attack actions that are accomplished are:

- Report observed attacks or enemy personnel movement
- Take cover
- If available personnel should try to seek cover in hardened, semi-hardened, or splinter protected facilities or bunkers.
- Perform self-aid

Post Attack

Some post attack actions include:

- Conducting a physical check within your facility and a visual check of the outside area for:

  - UXO
  - Casualties
  - Facility or equipment damage.

Figure 12-48

For more specific actions readiness flights accomplish to monitor passive defense measures in the CBRNE control center see AFMAN 32-4017, Chapter 6 and 7.

12. Expeditionary and Contingency Operations

o. Given applicable references, describe facts about the duration of biological agents with at least an 80% accuracy. STS: 12.6.1.5.3.

DURATION OF BIOLOGICAL AGENTS

This objective will cover: Physical and chemical properties of biological agents, characteristics, weather and terrain influences and duration references.

Physical and Chemical Properties

Physical and Chemical Properties are not significant worries with biological agents. Vapor pressure or volatility are not significant factors for biological agents. The chemical

structure of a toxin can strongly influence the stability of the agent regardless of environmental factors. Environmental conditions significantly affect pathogens unless they are altered or protected.

Characteristics

Biological agent characteristics such as encapsulation (natural: such as bacterial spores, or manmade protective coverings), addition of dyes to the spray fluid, or possibly genetic engineering (of pathogens) may protect some agents from sunlight and other destructive natural forces.

Weather and Terrain Influences

Weather and Terrain Influences are: Ultraviolet (UV) radiation, relative humidity, wind speed and temperature gradient are the most important weather factors in determining duration of effectiveness.

Duration References

Incubation period length and stability in environmental conditions can give an insight to the duration of biological warfare agents. Two sources for this information is AFTTP (I) 3-2.55, Chapter 4 and Appendix I and AFMAN 10-2602 Table A2.4

12. Expeditionary and Contingency Operations

p. Given applicable references, describe principles of a CBRN integrated detection network with at least an 80% accuracy. STS: 12.7.1.

PRINCIPLES OF CBRN INTEGRATED DETECTION NETWORK

This objective will cover: hazard analysis, types of detectors, use of detectors, establishing a automatic chemical agent alarm network, detector assets, detector employment

Hazard Analysis

Before setting up a detection network you need to first determine if one is needed. This is based on a comprehensive hazard analysis for your threat location. Hazard analysis is a three step decision-making process of collecting and analyzing information on potential threats. It is used to obtain a clear understanding of what hazards exist and the risk posed to people, property, missions and the environment. The information developed in a hazard analysis provides the basis for notification and reporting

requirements, establishes subsequent planning priorities and provides the documentation to support planning and response efforts.

Figure 12-49

The three key steps associated with hazards analysis. Are hazard identification, vulnerability analysis, and risk assessment.

Hazard Identification includes the following steps: Gather all available threat information. Ensure this "threat baseline" is agreed upon by all relevant activities. This will prevent follow-on disconnects between Readiness, Security Forces, OSI preparations, etc. and ensure unit commanders have a clear idea of the probable attack situation(s). Include potential major accident and natural disaster events in this "hazard identification".

Vulnerability Analysis includes the following steps: Determine the unit's ability to survive and continue effective mission operations in the event the previously identified hazards and attack situation(s) occur. Analyze each individual aspect of the threat in great detail. Readiness personnel must not attempt to accomplish the entire vulnerability analysis themselves. The functional OPR for each aspect of the threat (Security Forces for the ground threat for example) should take the lead in analyzing their area(s) of responsibility. Units will not be vulnerable to all threats or have the same degree of vulnerability to each hazard. For example, a unit might be totally prepared to operate in a tear gas environment, moderately prepared to operate in a non-persistent chemical environment and basically unprepared to operate in a persistent chemical or biologically contaminated environment.

Risk assessment is to determine the probability of the threat(s) and unit vulnerability. Risk assessment includes the following steps:

Develop work-arounds. This includes prioritizing vulnerabilities and balance available resources (time, materials, personnel) to determine work-arounds to mitigate unit shortfalls. Develop specific action items, with established OPRs and estimated times of completion for each item. Do not "close" an item simply because a request for additional materials, equipment, or personnel was submitted to higher headquarters. If the unit can't determine an adequate work around, inform higher headquarters of the situation and solicit their assistance. Use established lines of communications, the LIMFAC reporting network, etc., to keep higher headquarters abreast of unit capabilities and concerns.

Checklist from AFMAN 32-4017 may help assist in the risk assessment for the threat location.

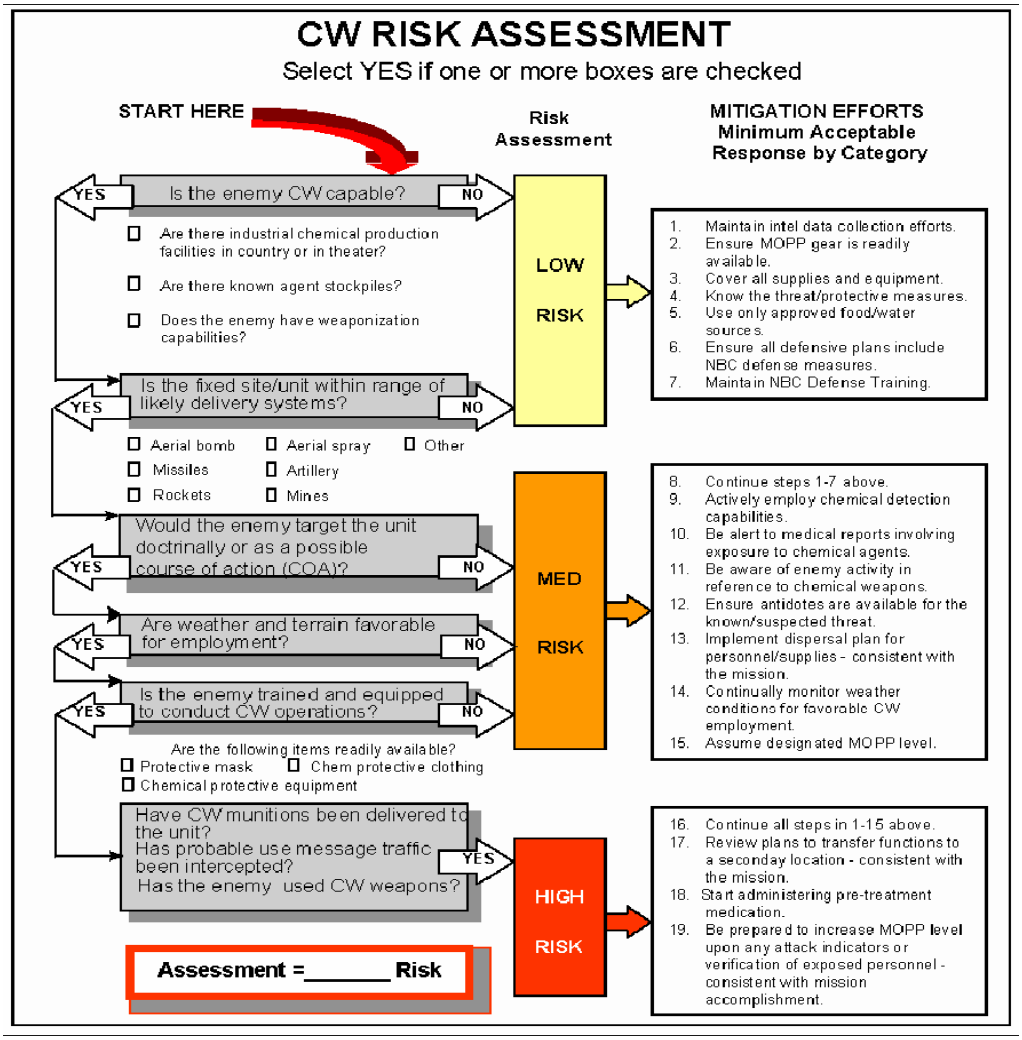


Figure 12-50

Types of Detectors

There are three types of detectors/monitors: manual liquid, manual vapor and automatic vapor detectors/monitors. Manual liquid detectors include M8 and M9 paper. Manual vapor detectors include the M256A1 kit. Automatic vapor detectors/monitors include the M22 and CAM/ICAM.

Use of Detectors

There are two ways of using chemical agent detectors: actively and passively.

> Active use includes using the kit after the attack at the suspected contaminated location in an attempt to confirm or deny presence of contamination. Examples: Dipping M-8 Paper into suspected contamination or pointing the CAM/ICAM at an expected contaminated surface.
>
> Passive use includes setting up detectors in an array during the pre-attack phase to alarm personnel that contamination may be present. Examples: Setting up M-8 paper on stakes forming Liquid Detection Points or Setting up M-22's in the DICE FIVE pattern forming Vapor Detection Points.

Establishing an Automatic Chemical Agent Alarm Network

M22's are used in point, stationary roles. Chemical agents can be delivered directly on unit positions (on-target attacks) or upwind to drift over the unit position (off-target attacks). Detection methods differ for each type of attack.

On-target attacks produce immediate casualties by contaminating troops and equipment. A large amount of agent must be delivered in a very short time (within 30 seconds). Alarms may take several seconds to respond, and they do not detect all chemical agents. Therefore, a large percentage of personnel might be exposed to chemical agents before an alarm sounds. This means that personnel must recognize the delivery of the chemical agents, observe a color change in the detector paper, or recognize symptoms of chemical-agent poisoning.

It is easier to protect against off-target attacks. Units use alarms to alert personnel that a chemical agent is about to drift over their position. Detector paper can also alert units that they are moving into a contaminated area. Personnel can then take protective action before being exposed to the agent.

Each unit and installation develops a plan for the deployment and integration of automatic chemical detection, identification, and warning systems with individual chemical detection systems. Plans must include the activation and use of an CBRNE warning and reporting system and local communications. Alerts may be achieved with

radio communications, public-address systems, or flags. manual systems are used for backup roles and to expand coverage. the current inventory of detectors sample for chemical vapors and the detector location. Manual systems provide an indication of a chemical attack in 12 minutes or less (for specific agents). Post attack determination for the presence or absence of chemical agents may take 30 minutes or more.

Detector Assets

CBRNE personnel determine how many detector assets are available. They assess how many detector systems are needed to provide coverage for the unit area or fixed site.

Detector Employment

CBRNE personnel prepare a dispersal employment scheme for assigned automatic detectors, M256A1 kits and M8 and M9 detector paper. The unit perimeter or installation is divided into sectors. Incident response maps can be overprinted with the sectors identified. The size and shape of the sector may vary based on what is located in the sector. A dice five pattern (a rectangle with five detectors, one in each corner and one in the center) can be used as the basic pattern. The dice five pattern can also be applied to the installation or unit area by placing available detectors evenly throughout the installation or perimeter. The prevailing winds for the fixed site should be taken into account. Detectors should always be concentrated on the upwind side. Identify critical functions and areas (C2 facilities, munitions sites, buildup and storage areas, aircraft locations, maintenance facilities, petroleum, oil and lubricants [POL], resources and cantonment and support areas). Predetermine M8 and M9 detector paper placement for unit monitoring. At fixed sites with limited assets and responsibility for small cantonment areas, use detection teams in the cantonment area in the dice five pattern and provide extended coverage of the perimeter as detectors become available. If detectors are not available, the unit should disperse any necessary sampling supplies or equipment or otherwise prepare to sample, preferably at the same designated detector sites.

A unit emplaces alarms as soon as it arrives in the area it plans to occupy. If possible, detectors should be no more than 150 meters upwind from the farthest upwind unit position. This warns the personnel upwind and those farther downwind. The detector units should never be placed more than 400 meters from the alarm unit; otherwise, the signal may not be strong enough to sound the alarm. The optimum spacing of 300 meters between detectors reduces the risk that a chemical cloud will drift between detectors without sounding the alarm.

The number of alarms needed to protect a unit depends on the unit size. The larger the unit front, the more detectors are needed to warn the unit. In this case, *front* means the upwind direction.

Some additional considerations when setting up a detection array are:

- The exact detector locations are not as important as ensuring that a sufficient number of detectors are staggered in upwind positions from where personnel may be working or sleeping.

- Detectors should be not be within 25 feet of any major structure to ensure maximum exposure to prevailing winds and to limit interference caused by buildings.

- Detectors should be positioned at least 3 feet off the ground, but no more than 6 feet, to ensure maximum exposure to the contaminated environment.

- Detectors should be placed near personnel so that alarms can be heard and detector malfunctions reported. On the perimeter, detectors are ideally positioned next to defensive fighting positions.

- Commanders should rely on additional information when confirming an attack. When possible, do not rely on the results of a single detector to determine if contamination is present. Observe post attack data for the activation of additional detectors, M8 and M9 detector paper reaction, environmental indications, casualties and other detection means to confirm a chemical attack.

- Everyone is issued M8 and M9 detector paper. It can be used after a suspected attack to confirm chemical use.

- All personnel must be trained to check suspected surfaces with M8 and M9 detector paper before touching them. They must avoid marked-off areas (contamination and UXO).

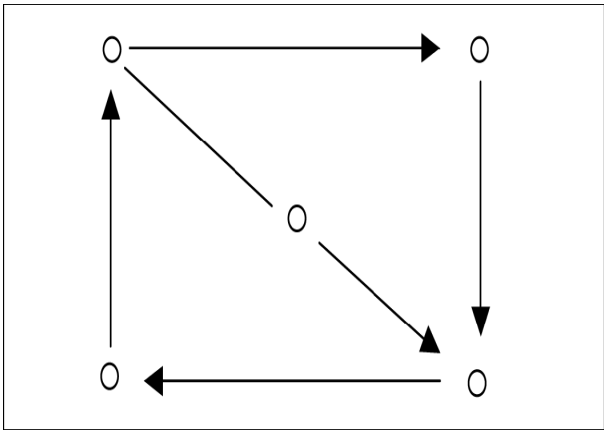


Figure 12-51

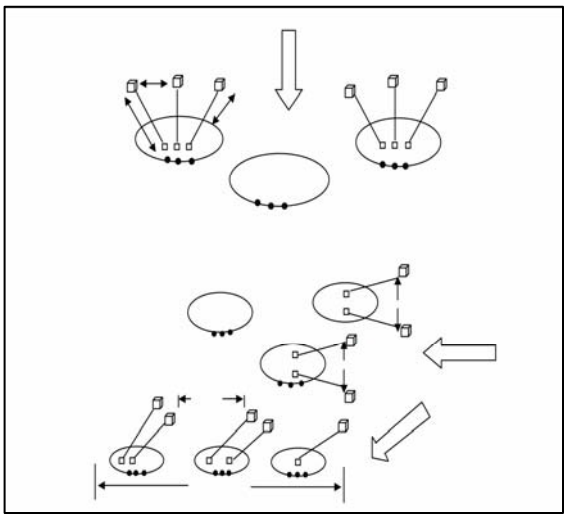


Figure 12-52

NOTE: When emplacing alarms, the wire connecting the alarm and the detector must be protected from indirect fire. This can be done by burying the wire. It should be checked periodically (at least every 4 to 6 hours) to ensure that it has not been broken or cut.

12. Expeditionary and Contingency Operations

q. Given applicable references, analyze the steps necessary to develop a CBRN integrated detection network plan with at least an 80% accuracy. STS: 12.7.2.1., 12.7.2.2., 12.7.2.3.

DEVELOP CBRN INTEGRATED DETECTION NETWORK PLAN

This objective will cover: detector capabilities in relation to the threat, operation limitation of detectors in relation to environmental and operational conditions and how to develop a plan.

Detector Capabilities in Relation to the Threat

Detector capabilities should be assessed to the threat. Knowing the specific threat in turn of type of agent and quantity of agent you can then assess if your detection equipment is adequate. Table 4.6 in AFMAN 32-4017 can be a useful tool in assessing threshold sensitivities of detector equipment. Table 4.10 is another table that can be helpful when using the CAM and assessing the hazard concentration.

Table 4.10. CAM Bar Readings.

AGENT	READINGS [2,3,4]					MIOSIS (.03 mg/m3)
GA (Tabun)	0.043 mg/m3	0.13 mg/m3	0.41 mg/m3	1.4 mg/m3	3.0 mg/m31	4.4
BARS	2 - 3	4	5	6	7 - 8	
GB (Sarin)	0.03 mg/m3	0.1 mg/m3	0.32 mg/m3	1.1 mg/m3	3.0 mg/m31	.04 - 2.5
BARS	1 - 2	3 - 4	5	6	7 - 8	
GD (Soman)	0.035 mg/m3	0.12 mg/m3	0.33 mg/m3	1.2 mg/m3	3.0 mg/m31	.04 - 2.5
BARS	2 - 3	4	5	6	7 - 8	
VX	0.05 mg/m3	0.16 mg/m3	0.33 mg/m3	0.66 mg/m3	1.0 mg/m31	.1
BARS	3	4 - 5	6	6	7 - 8	
HD (Mustard)	0.11 mg/m3	0.35 mg/m3	1.2 mg/m3	2.6 mg/m3		100
BARS	4	5	6 - 7	8		

Figure 12-53

Operational Limitation in Relation to Environmental and Operations Considerations

Each piece of detection equipment has operational limitations. Lets cover some operational limitations for M8 paper, M9 paper, the M256A1 kit, the M22 and the CAM. This is just an overview for more in depth information refer to the equipment technical order.

M8 paper will function in snow, rain, and sleet. However, if the M8 paper becomes saturated with water, false color changes can occur. M8 paper reaction is immediate at temperatures above 32°F. At temperatures below 32°F, reaction time may take up to two minutes.

M9 paper operational limitations include temperatures above 125°F; brake fluid, hydraulic fluid, gasoline, aircraft and automotive grease; DS-2 decontamination solutions; and insect repellent cause false responses to M9 paper. Refer to T.O. 11H2-2-21 for complete list.

M256A1 operational limitation include first detector packages are a one-time use item. If any of the following conditions exist, Do Not use: outdated detector packages, discolored detector samples, open detector packages, or water soaked samplers. Avoid direct sunlight on sampler when operating.
Avoid sampling in smoke and do not touch individual detector test spots.

Some operational limitation with the CAM is that first it is a monitor, not a detector, and can become contaminated or overloaded (saturated) if not used properly. The CAM can only detect vapors at the inlet nozzle. It will not give the vapor hazard over an area from a single point. The CAM is currently the best fielded device we have to at least approximate the concentrations of chemical agent vapors present at any given time. While it does not provide a digital readout with exact chemical concentrations, the

CAM's individual bars do equate to intensity ranges. However, Readiness personnel should use the intensity levels as a guide and must not use a single CAM as an absolute source of information.

Some operational limitations are the M22 system is limited by both battery power life and airfield interference. Refer to T.O. 11H2-23-1 for guidance.

How to Develop a Plan

Some steps in developing a CBRN integrated detection network plan:

> Complete a risk assessment to determine if a detection network plan is needed. If a detection network is needed, utilizing the information previously learned, sector off the base into four areas. Determine how many detector assets are available. Determine the predominant wind direction. Set up locations for VDP detectors in the DICE five pattern on the upwind side of the base. Determine locations for LDP's. LDP's should be set up next to work centers whenever possible. Otherwise, evenly space LDP's throughout areas to be monitored by recon teams. Identify locations for CAM footprint readings to be taken. Decide how recon teams will respond after an attack (auto roll vs. waiting for agent deposition).

12. Expeditionary and Contingency Operations

r. Given applicable references, describe facts about the employment of a CBRN integrated detection network with at least an 80% accuracy. STS: 12.7.3.1., 12.7.3.2., 12.7.3.3.

EMPLOYMENT OF CBRN INTEGRATED DETECTION NETWORK

This objective will cover: how to implement a detection plan, how to monitor a detection network system and how to identify deficiencies in the detection network.

Implement the Plan

After developing the detection network plan the next step is to implement the plan. When implementing the plan it is important to use the technical orders associated with the detection equipment to ensure all operations checks are done correctly. When setting up the detection network it is also important to have a command and control function initiated to track the progress of set up and to be available for safety and security concerns.

ARMY TM 3-6665-321-12&P
AIR FORCE TO 11H2-23-1
MARINE CORPS 10434A-12&P
NAVY (NAVSEA) EE168-OB-OMP-010

TECHNICAL MANUAL

OPERATOR'S AND UNIT
MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND
SPECIAL TOOLS LIST)

FOR

ALARM, CHEMICAL AGENT, AUTOMATIC: M22
(NSN: 6665-01-438-6963) (EIC: SAC)

AND

AUXILIARY EQUIPMENT

POWER SUPPLY, CHEMICAL AGENT AUTOMATIC ALARM: M28
(NSN: 6130-01-438-6960)
MOUNTING KIT, CHEMICAL AGENT AUTOMATIC ALARM: M281
(NSN: 5820-01-438-6959)
ALARM UNIT, CHEMICAL AGENT AUTOMATIC ALARM: ABCA-M42
(NSN: 5855-00-806-2216)

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HEADQUARTERS, DEPARTMENTS OF THE ARMY, AIR FORCE,
MARINE CORPS, AND NAVY
MARCH 1998 PCN182104340000
CHANGE 2 01 AUGUST 2002

Figure 12-54

Monitor Detection Network Systems

After the detection network has been implemented the next step is to monitor the detection network systems. Monitoring begins with running a recon route. The recon route should be done in the same order every time and should be annotated on a crash grid map. The recon route should be run several times to get a baseline time established. This will help the command and control element in assessing base operability for the commander should an attack occur. Items to look for while monitoring the detection network can be found in AFMAN 10-2602, Table A3.1 and will be covered in detail in objective 12t.

Figure 12-55

Identify Deficiencies

Deficiencies are not usually realized in a detection plan until the reconnaissance team employs the plan. Some deficiencies involve not having equipment to accomplish the desired or "perfect" detection network. Other deficiencies are associated with problems with the set up of the developed detection plan. Actual terrain conditions such as mud pits and deep ruts in the ground are not visual on a grid map so the location of VDP's or LDP's may have to be changed. Some locations for the VDP's may be located to close to natural vapor sources that cause the detector to continuously alarm falsely, which would also cause a change in the detection plan. Another problem that occurs frequently, is huge holes in the detection network as well as improper placement of the VDP's and LDP's. Some common placement problems include setting up M8 paper under covered areas such as trees and setting up M22's too close to buildings or higher than 6 feet or lower than 3 feet off the ground.

12. Expeditionary and Contingency Operations

s. Given applicable references, define the logistics and communication requirements for CBRN reconnaissance teams with at least an 80% accuracy. STS: 12.8.1.

LOGISTICS AND COMMUNICATIONS REQUIREMENTS FOR CBRN RECONNISANCE TEAMS

This objective will cover equipment requirements and communication requirements for CBRNE teams.

Equipment Requirements

The following are some equipment requirements and considerations:

- CBRNE equipment repair capability available in the local area (RADIACS, chemical detection, etc.)
- Equipment standardization issues with host nation or other U.S. military service personnel (filter element swaps, batteries, etc.) need to be addressed
- Equipment interoperability issues with host nation or other U.S. military service personnel (suit removal, detection instrument units of measurement, etc.) need to be addressed
- Restrictions on bringing U.S. CBRNE assets into the country need to be managed

- Determine if pre positioned assets are available. If so, determine their location and serviceability.

- Determine what individuals will do with their hand carried CB individual protective equipment (IPE)

- Get with the Logistics Readiness Flight to determine when the CB IPE scheduled to arrive from the Consolidated Mobility Bag Control Center (CMBCC) will arrive
- Determine how the CB IPE will be maintained.

- Determine how disposal of contaminated IPE will be handled

- Find out if the host country possess enough IPE for their personnel. If not, address if enough IPE is available for at least those host nation personnel that are critical to the unit's mission operations

List of recommended equipment items for recon teams can be found in AFMAN 10-2602, Table A6.2

Communications Requirements

Some communications requirements and considerations for a CBRN team are:

- Evaluate Adequacy of Local Alerting System is the first item to evaluate for communication effectiveness. Every Air Force installation must have a rapid and effective system for dissemination of disaster information. There are many ways to ensure this information is disseminated to include: Giant Voice, radios, telephones, secondary crash phone, word of mouth, visual system such as flags and lights.

    At some overseas locations, Armed Forces Network (AFN) will usually broadcast emergency information over their television and radio stations. One responsibility of a Readiness technician is to evaluate the adequacy of the local reporting system. Some of the items to evaluate are: Compatibility with host nation, local, or theater systems, availability all areas on the installation. Local warning signals should be displayed in all work and rest areas. Forces deploying into your base should be briefed on them, since they might be used to different signals and periodically testing the warning system to identify areas of the base where the Giant Voice system can not be heard and develop alternate notification procedures. Also, Base Operations normally perform a daily check of the secondary crash phone. Most radios and telephones used everyday also need to be checked. In addition, the overseas Air Force Network will perform a test of their emergency broadcast periodically. Exercises serve as the best means to test your alerting system. This is the most practical time to evaluate unit control centers on their

procedures for disseminating information throughout the unit. Finally, when deploying ensure alerting capabilities are written in applicable planning documents. If the deployment location is unknown, evaluate and brief the alerting system to the deployment team upon arrival

Some questions to ask yourself when determining communication requirements are:

- What communications capabilities currently exist at the location?
- Is there an installation-wide warning system?
- Does a Giant Voice System exist and what are the areas of coverage?
- Are there tapes for Giant Voice in all applicable languages?
- Does the warning system have the capability to broadcast the siren sequences the base populace is used to hearing?
- Is the system set up so that a power loss or other problem in one sector does not adversely affect other sectors?
- Does the system have back up power or uninterrupted power supply capabilities?
- How many tactical and non-tactical radios will Readiness personnel have access to at the employment location?
- Have radio frequencies been pre-identified within the theater for various functions?
- Do Civil Engineer radios have the required frequency and/or programmable capability?
- Are unit radio frequencies in conflict with another user?
- What is the range of the radio's (with and without repeaters)?
- Are there any "black holes" on the base (no or poor quality radio contact)?
- Do Readiness personnel and/or the CBRNE Control Center have the capability to talk to joint service forces (Army Patriot and/or Fox vehicle operators for example) via radio?
- Will available radios reach the proposed installation open-air CCA/TFA complex?

- Are communications available, both primary and backup, from the CBRNE Control Center to all planned billeting and personnel protection locations to include shelters, collective protection facilities, and tent cities?

- If a collocated operating base (COB), does a hot line exist between host and tenant CBRNE Control Centers?

- Are cellular phones a possible alternative to established landline communications needs?

- When will critical communications assets be available?

- Are there Wing Initial Communications Packages (WICP) packages scheduled to deploy with the unit, and if so, what type and how many WICP assets can Readiness personnel expect to use?

- Is phone service readily available at the site?

- Does a secure voice capability exist at the deployed location?

- Does a DSN capability exist?

- Are there adequate numbers of lines to support mission operations?

- Does a message center exist with adequate capabilities?

- Does the site have designated phone lines for automated NBC plotting and reporting hook ups?

- Does the site and/or expected UTCs have sufficient computer workstations (with appropriate software) to effectively conduct mission operations?

- Are there any known communication's choke points i.e., a single cable or switchboard that holds the wiring for the majority of installation communication lines?

- If appropriate, what communications lines will be used to pass or receive hazard information from local civil defense, air defense, or security notification systems?

12. Expeditionary and Contingency Operations

t. Given applicable references, describe the principles of operations of CBRN reconnaissance teams with at least an 80% accuracy. STS: 12.8.3.1., 12.8.3.2.

OPERATIONS OF CBRN RECONNISANCE TEAMS

This objective will cover Air Force recon capabilities, on base recon principles such as establishing recon sectors, determining organization, CBRNE recon team equipment, preparing a CBRNE recon team and off base recon principles.

On Base Reconnaissance Principles

Some Air Force Reconnaissance Capabilities include Readiness and Bioenvironmental Engineer Flights.

The Readiness flight is the focal point for non-medical CBRNE defense. CE Readiness flight personnel are CBRNE technicians. They are responsible for managing and supporting (non-medical) CBRNE planning, training and operations on the base. All other units on the base support CBRNE defensive operations, as necessary, with their own organic resources (primarily unit decontamination teams and post attack reconnaissance sweep teams). CE Readiness flights establish and operate the base CBRNE detection grid (point and standoff detectors), conduct CBRNE reconnaissance missions on and near the airbase, operate the CBRNE control center and perform CBRNE warning and reporting system functions.

Figure 12-56

Figure 12-57

BEE Support
The Bioenvironmental Flight personnel are integrated into the post attack reconnaissance team will conduct environmental sampling and surveillance to identify the extent and persistency of contamination in contaminated areas or formerly contaminated areas. With unit support, they also compile exposure information from dosimeters, individual sampling badges and CBRNE defense cell data to assist in the medical treatment process and document exposure.

Base Sectoring
Peacetime preparedness at fixed-site locations in CONUS or OCONUS includes assessment of the site mission capabilities and response actions in a CBRNE environment. Based on the large geographical area that many fixed sites occupy, commanders may consider establishing CBRNE response sectors to aid CBRNE reconnaissance actions. The value of CBRNE sectors can become particularly useful upon receipt of post attack CBRNE reconnaissance reports. When attacks are imminent, commanders should make the same initial alarm and MOPP declarations for the entire installation. The use of sectors is very helpful in determining if Split MOPP is an option after an attack.

Team Composition
The minimum size of a recon team is two people. One member maintains a constant watch for hazards, provides security and calls for assistance if accidents or injuries occur. There is no maximum number of team members; however, team size should be kept to a minimum to reduce the number of people exposed to post attack hazards while still maintaining an ability to accomplish the mission. The use of large teams depends on the unit mission, weather, manning and need for additional security.

Equipment
Equipment allowances vary depending on unit authorizations and whether vehicles and communications equipment are designated for team use. Leaders adjust actual team equipment needs to match the threat, area of coverage, terrain, or mission. Reconnaissance team equipment may be dedicated and stored in team kits, or teams may use equipment from shelter management or other unit team kits.

Reconnaissance Preparation

Preparing recon teams includes preparing all units to prepare to provide reconnaissance for their specific areas. Timely reporting allows the CBRNE control center to assess the total status of mission resources and assign recovery forces where they are most effective. Specialized CBRNE reconnaissance teams may be directed to start operations immediately after the attack to provide commanders with a quick assessment of the status and the overall post attack situation. Commanders may also direct specialized teams to *auto roll* as soon as the attack is over.

Unit post attack reconnaissance (PAR) teams and individuals generally do not begin operations until directed by the CBRNE control center. When preparing for post attack reconnaissance, teams will exercise caution to avoid crossing through cordoned and contaminated areas.

Team preparation includes planning for site security when selecting locations for CBRNE detectors and M8 detector paper. This reduces the possibility that pre-selected and routinely checked sites could be mined or that teams could be targeted for ambush during routine operations. As a general rule, do not locate detection sites outside established perimeters unless they are coordinated with, and approved by, security forces.

Figure 12-58

Planning ensures that personnel within facilities, expedient bunkers, and defensive fighting positions pre-position M8/M9 detector paper in locations where they can observe the paper without physically leaving their protected positions. Place the M8 detector paper on a raised surface that is slightly canted toward the observation point. Use binoculars or a spotting scope during daylight to observe M8/M9 detector paper from the protected position or from beneath overhead cover. For nighttime operations, attach a rope or string to the observation stand or pad and pull it to an opening. Use only white light to read the M8/M9 detector paper. Do not use night vision goggles (NVG's) or night vision rifle scopes because they do not show color changes.

Some pre attack actions for recon teams are to instruct recon teams that are traveling over a predefined route to begin physically checking and reporting the status of each detector on the installation. Other representative actions may include:

• Inventorying CBRNE detection assets and integrating resources with the host base, HN and joint forces.

• Continuing the assessment of manpower and support requirements.

• Identifying shortages and overages to higher headquarters.

• Developing mission tasks and work schedules for CBRNE personnel and augmented support personnel.

• Establishing and evaluating the CBRNE detection array.

• Activating the CBRNE detection, identification and warning system(s) when
required.

• Establishing primary and secondary C2 capabilities in the survival recovery center (SRC) and the damage control center (DCC).

• Identifying and training personnel for CBRNE reconnaissance teams. (Define the AOR for each team, and ensure that communications and verification procedures are established.)

• Identifying and establishing CCAs for CBRNE-protected facilities.

• Identifying potential CCAs and TFAs if collective protection is inadequate or nonexistent.

• Ensuring that all CBRNE reconnaissance team personnel have been issued
serviceable PPE and that reserve stocks are protected from loss, damage and possible contamination.

• Assisting unit personnel by checking their equipment for serviceability and ensuring that they inspect, maintain and clean their assigned equipment.

• Evaluating installation contamination avoidance activities.

• Evaluating installation passive defense activities (e.g., dispersal, cover, concealment, deception).

Some recon team trans-attack and post attack actions are to:

• Implement contamination avoidance measures and take cover during

attacks. Maintain situational awareness and report key observations as needed.

• Perform attack damage and hazard assessment.

• Survey the immediate area for casualties, UXO's, damage and indications
of chemical use or fallout.

• Report findings and observations on weapon systems, munitions and tactics used in the attack to the CBRNE center.

• Monitor the area to verify the presence (or absence) and extent, of CBRNE
agents.

• Be alert for indications of biological-agent use.

• Recommend a protective posture that applies to the threat or recommend
further attack if contamination is absent. Conduct surveys to define and mark contaminated areas if contamination is present.

• Use the M291, M295, or another approved decontamination kit, as required, to decontaminate surfaces (vehicle access handles, equipment controls, bare metal, glass) before touching them.

• Plot contaminated areas, advise the CBRNE center on the agent persistency
and provide CBRNE reports and warnings.

• Monitor for the arrival of fallout (e.g., plot nuclear detonations and fallout, predict downwind hazards). If fallout arrives at the installation, implement exposure and radiological contamination controls, predict radiation intensities and submit required reports.

• Evaluate craters to determine if a ground-bursting chemical weapon, conventional warhead, or airburst debris caused the crater.

• Identify vapor concentrations along designated routes.

• Collect, package and mark soil, water and vegetation samples that may be contaminated.

• Provide reconnaissance-related information to the CBRNE center. Report the:

- Physical state of the agent (powder, liquid).
- Apparent viscosity (neat sample or thickened agent).
- Size of droplets.
- Effect on vegetation, animals and personnel.

• Check the placement of detectors and the sector and area transition signs.

• Reposition vapor detectors between contaminated and uncontaminated areas or sectors as required, and replace the detectors if necessary.

• Search for residual hazards.

• Determine if designated open-air CCAs and TFAs are contaminated and locate uncontaminated CCAs and TFAs.

Ensure that personnel know their individual post-attack reconnaissance responsibilities. Critical mission-essential activities continue during post-attack reconnaissance and non-mission-essential personnel use available protection (e.g., remain indoors) until hazards have been identified, located and reported.

Off Base

Off base response utilizing specialized recon teams may be required depending on the support plans the installation has with the host nation and joint operations. When directed to do recon off of the installation by your command and control it is important to gather as much information about the situation you are about to enter from intelligence personnel and the owning joint or coalition force. Considerations such as security and communications need to be addressed. The way the off base response is handled will be dependant on joint and coalition plans, the recon mission and requirements of the specific mission.

12. Expeditionary and Contingency Operations

u. Given applicable references, describe facts about contamination avoidance with at least an 80% accuracy. STS: 12.8.5.1., 12.8.5.2.

COMTAMINATION AVOIDANCE

This objective will cover: the concept of operations and principles of contamination avoidance.

Concept of Operations

Contamination avoidance is a broad area that includes all of the actions taken to minimize the impact of CBRNE contamination on operations. Successful avoidance measures will significantly reduce (and often prevent) personnel, equipment, vehicle, aircraft and cargo contamination. Operational advantage is gained through a more rapid reduction of protective measures and a reduced requirement for personnel and equipment decontamination.

Principles of Contamination Avoidance

Principles of contamination avoidance include actions such as limiting contamination entry into facilities, detection and identification, prediction, marking, dispersal, relocation and rerouting and sampling. Review specific contamination avoidance actions to ensure they do not conflict with safety (air, ground, or munitions), fire prevention, or functional area technical order requirements. If conflicts arise, contact the responsible safety office or functional area supervisor.

Cover and Limit Entry

The most effective way to avoid contamination is to prevent the asset from becoming contaminated in the first place. Develop low or no-cost standing operating procedures to put equipment that is not being used under overhead cover. If the equipment cannot be placed under overhead cover, wrap or cover it with at least one layer of barrier material to prevent contamination. Use water repellant plastic sheets, canvas, tarpaulins, or specialized CBRNE protective covers (if available). Use two layers of cover so the top cover, along with any contamination, can be easily removed, safely discarded, and replaced. When removing contaminated barrier material, remove and fold the material in a manner to encapsulate the contaminated surface. Place the covers in containers or plastic bags and neatly stack to simplify waste removal.

Place aircraft, vehicles, aerospace ground equipment, munitions, and bulk supplies into shelters or under overhead cover. Close all facility windows, turn off

(or close outside air intake) ventilation systems at the time of attack and implement single- entry procedures.

Pre-plan specific actions when attack threats increase. Include these actions, for example, within alarm condition checklists. When attack warning is given, personnel should accomplish quick and easy "last second" actions to further protect critical equipment. These actions may include placing tools, weapons and equipment under cover; or closing aircraft canopies, building and vehicle windows and equipment access panels.

Detection and Identification

CBRNE agent detection and identification activities provide commanders with the information needed to determine protective postures and to tailor protective actions to the specific agent threats. Early detection provides more time to implement protective measures. Accurate identification of agents enables selection of the most effective protective actions, including medical treatment, and limits mission degradation that results from taking unnecessary actions. NBC detection and identification includes the use of point and standoff detection methods, risk assessment and all available medical and non-medical intelligence assets.

Detection for Protection and Warning- Standoff detection provides warning in sufficient time to implement protective measures before exposure to agent contamination occurs. For attacks upwind, detection must occur at sufficient upwind distances to provide a reasonable amount of time for detection, processing and information transmission. Detection of the leading edge of the cloud is preferable, since it can give more warning time. Warning of an upwind attack may come from upwind detectors placed outside the airbase or from other units monitoring the area upwind.

Detection for Treatment- Detection for treatment is focused on identifying the type of biological agent dispersed in an attack so treatment can be rendered as early as possible. Some aspects of treatment are agent-specific; therefore, agent discrimination is extremely important. Agent sampling and analysis continue to be the primary means of accomplishing this detection role. Sampling is a local action, while analysis can occur locally or at designated medical laboratories, depending on capabilities. Medical personnel collect and submit clinical samples from patients and perform environmental sampling and detection functions.

Detection for Verification- Detection for verification provides critical information to the President of the United States and United States Secretary of Defense to support decisions concerning the need for tailored response and to select options in a timely manner. Specific procedures for

sampling and transporting samples to a laboratory may vary depending upon the airbase location and host-nation requirements. Follow theater and MAJCOM direction for the overall process
and responsibilities for the collection and evacuation of samples for analysis.

Detection for De-warning- Detection for de-warning means detecting to identify when contamination reaches levels that enable removal of the protective mask. Use various types of surfaces when conducting agent detection. For example, some chemical warfare agents will remain, or persist, much longer on glass and within shaded areas than on items such as painted surfaces, concrete and asphalt. This comparison provides valuable insight to commanders when considering appropriate actions.

Detection for Surface Contamination- Detection for surface contamination is the ability to detect deposited contamination on surfaces. The results are used to determine the need for immediate or operational decontamination and appropriate protective equipment. They may support the need to use alternate routes to avoid contaminated terrain if personnel cannot wait the short time period required for agent absorption. Results may also be used to adjust protective measures for people handling contaminated material.

Prediction

CBRNE contamination hazard prediction allows commanders to determine the probable effect of contamination on current and future operations. Civil engineer readiness specialists use a combination of both manual and automated methods to predict the location, movement and persistency of contamination. These methods use post-attack detector data, physical observations and automated predictions to identify known contamination and likely hazard areas. Prediction tools and specialist expertise enable a rapid assessment of mission impact and a means to quickly communicate contamination information to higher headquarters, joint service and coalition forces.

Marking

Once contamination is located, it must be marked to notify others that precautions are required. Marking can significantly reduce the spread of contaminants by identifying areas, vehicles, aircraft, equipment, or material to avoid or decontaminate (if possible). CBRNE contamination normally should be marked immediately upon discovery. This action warns others of the hazard and avoids the need to send personnel back to the site a second time. If evidence of contamination is observed but mission requirements prevent immediate marking, provide the location and type of contamination or other observations to the unit control center.

Figure 12-59

Relocation and Dispersal
Relocation and dispersal sites offer an operational alternative if enemy attacks prevent or restrict operations at primary bases. Relocation plans should be developed prior to attack and include both personnel and aircraft options. Consider reciprocal agreements to provide temporary support at other Air Force or coalition forces within the region. Within most theaters of operation, dispersal sites will not support full-scale operations. However, dispersal remains a viable option if circumstances prevent operations at primary bases. Feasibility considerations include the time required to conduct operations, availability of cross-servicing facilities, communication connectivity and the availability and type of munitions. Also, consider the significant logistics issues involved with moving or pre-positioning people, equipment, and consumables to support dispersal site operations and security.

Sampling
Sampling includes field collection procedures that facilitate laboratory analysis and verification of CBRNE attacks. Sampling is a post-attack action that allows validation of an attack and confirmation that appropriate protective measures were taken.

12. Expeditionary and Contingency Operations

v. Given applicable references, describe the principles of CBRN protective covers with at least an 80% accuracy. STS: 12.8.5.3.1.

CBRNE PROTECTIVE COVERS

This objective will cover: principles, types and inspection of protective covers

Principles

In chemical warfare threat areas, contamination avoidance is the key to preventing assets from becoming contaminated. Place assets beneath an overhead cover when they're not in use. If overhead cover is unavailable, wrap or cover assets with at least one layer of barrier material such as repellent plastic sheets, canvas, tarpaulins, or specialized CBRNE protective covers (if available.) Wind can wreak havoc on contamination avoidance covers. Ensure all barrier material is tightly secured around assets stored outdoors and roll excess material beneath the asset.

Figure 12-60

Use two cover layers when possible so the exposed cover (along with any contamination) can be easily removed, safely discarded and replaced Discard contaminated barrier material and M8 paper in your unit contaminated waste collection

point. Periodically take accumulated trash to the installation contaminated waste disposal area. Place M8 Paper on the exposed horizontal layer of barrier material and don't forget to mark and date its time of placement.

Air Mobility Command will move strategic airlift cargo regardless of the chemical or biological environment at the deployment site. Contamination avoidance is the key to air mobility movement. If you're deploying to a CBRNE threat area, triple-wrap each pallet and affix M8 Paper on the outside and on each internal layer of the barrier material. The technique is to place one barrier layer below the cargo net and two over the top. If a pallet should become contaminated, discard and replace the outer layer. Contaminated pallet netting presents a residual vapor hazard, it can't be decontaminated and must be treated as contaminated waste.

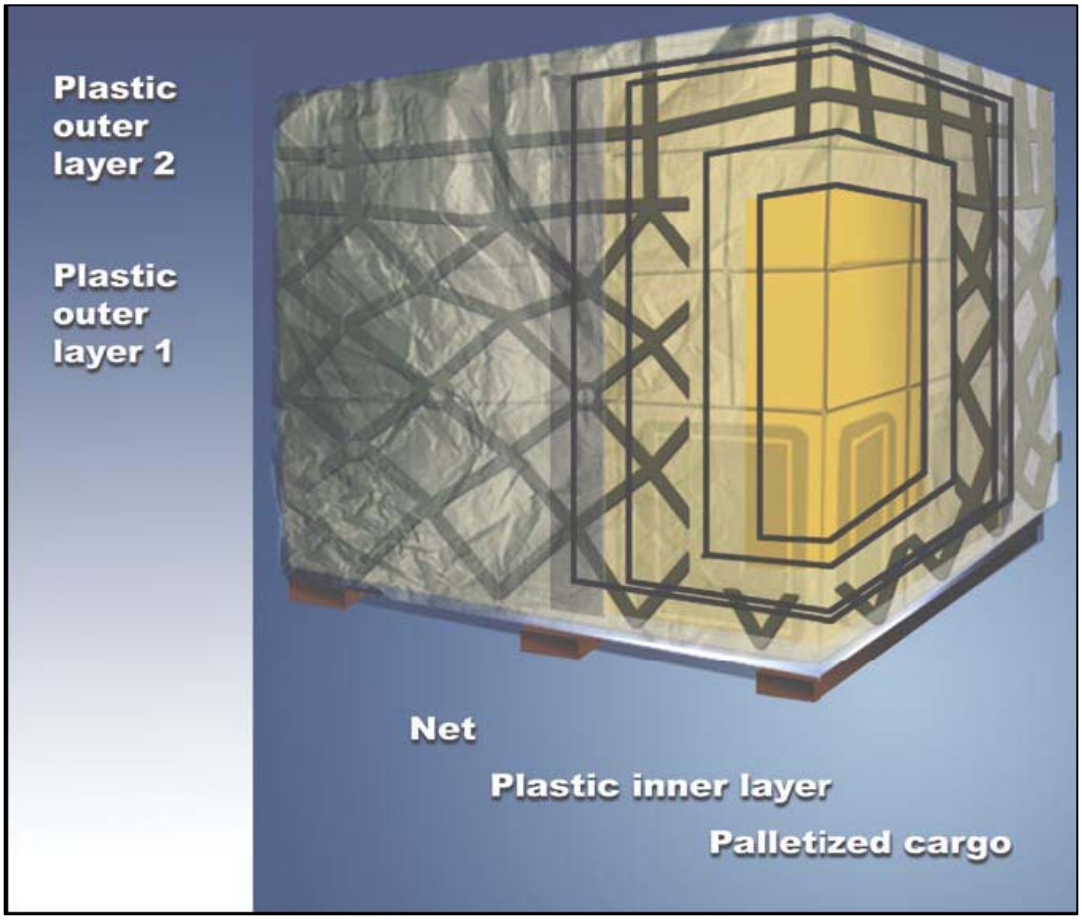

Figure 12-61

Types

Pallet covers are traditionally used to cover assets, but many other covering materials will do. Plastic sheets, canvas, tarpaulins, or other CBRNE protective covering are all effective products. Just remember, the thicker and less absorbent the material, the better overall protective factor it will have.

Inspection

Inspect the CBRNE protective covers to ensure they are free from all rips and tears. Any punctures in the covering material make it unserviceable. Discoloration is a strong indicator that the cover has degraded. Ensure the material has not been degraded by weather, improper handling, etc.

12. Expeditionary and Contingency Operations

w. Given applicable references, analyze the steps necessary to execute contamination avoidance with at least an 80% accuracy. STS: 12.8.5.4.1., 12.8.5.4.2., 12.8.5.4.3., 12.8.5.4.4.

EXECUTION OF COMTAMINATION AVOIDANCE

This objective will cover how to develop a contamination plan, coordinate the plan, execute and monitor contamination avoidance.

Plan Development

Develop plan for contamination avoidance to cover items such as CCA location, setup, resources and manning. Also address issues such as covering assets, monitoring timelines and sampling. Guidance for determining how many CCA's to set up and manning can be found in AFMAN 32-4005 and AFMAN 32-4017.

Some items to consider when writing a contamination avoidance plan are:

- Plan CCAs for assigned collective protection systems and for open air operations.
- Designate and train monitors in CCA management and train personnel in CCA use.
- Develop procedures and checklists for assistants and signs for processing personnel.
- Obtain supplies and equipment for stocking and re-supply.
- Develop procedures and designate areas for OG aeration, rubber IPE decontamination, weapons decontamination and storage and trash disposal (discarded contaminated equipment, and waste generated by shelters and CCA operations).
- Place shelter and CCA supplies and equipment susceptible to contamination under covers.

- Process supplies and equipment for shelter re-supply through the CCA. Replace these covers as necessary based on serviceability, perceived agent penetration capabilities, etc.
- After a chemical attack it may not be necessary to process the entire base populace. This decision will be determined by the agent's expected persistency time. Determine CCA processing line configurations.
- Decontaminate IPE as soon as practical (approximately 15 minutes) after contamination occurs.
- To the largest extent possible, and with the authorization of the installation commander, try to delay processing personnel exposed to liquid/solid agents to allow decontamination by weathering. A one to two hour delay can reduce contamination levels significantly, thereby reducing the risk of agent transfer.
- Bag and remove liquid/solid contaminated IPE and waste from the CCA as soon as possible to reduce vapor levels. Also bag and remove trash from shelters. Mark the bags as contaminated waste, OG, human waste, trash, etc. If possible, use egressing personnel to take the bags to the designated disposal areas or to the decontamination area.

Coordination

Once a plan is developed ensure it is coordinated with the host nation and joint operations plans. Also, coordinated through base offices such as services, security forces, bioenvironmental engineering, civil engineering and medical.

Execution

The following are items to consider when executing contamination avoidance:

- During pre-attack action close all doors and windows and shut off HVAC systems
- Bring all mission critical items under overhead cover
- If unable to bring under cover, use barrier material to protect the asset
- During attack take cover to protect yourself from falling contamination
- Keep deposition rates (60 minutes for 100%) in mind prior to running recon route after an attack
- During post attack avoid obvious contamination and mark areas to prevent others from becoming contaminated
- Dispose of all contaminated waste in assigned areas
- Set up CCA in accordance with CCA plan.
- Establish CCA entry and exit routes and post signs.
- Stock CCA with supplies and available IPE.

Figure 12-62

Monitoring

When monitoring for contamination avoidance use a CAM comparing CAM footprint reading to current reading to determine if contamination is present. For constant monitoring set up M22's around suspected contaminated areas to ensure environmental conditions do not allow for contamination to pass to uncontaminated areas of the installation. M22's should also be set up at transition points while using split MOPP. For contaminated assets, such as vehicles, consider using the ten foot rule.

The 10-foot rule was developed in order to provide guidance for protecting personnel who have to use and/or handle chemically contaminated resources or work in locations with materials that might retain a residual chemical hazard longer than the major terrain surface area on which it is located. The 10-foot rule embodies a safety factor that goes beyond current Office of the Secretary of Defense guidance (which allows removal of IPE whenever the most sensitive field detectors no longer detect a chemical agent vapor hazard).

Figure 12-63

There are two phases associated with the 10-foot rule:

- Initial Phase: During the initial phase, personnel will remain in MOPP 4 whenever they stay within 10 feet of the contaminated equipment for more than a few seconds. This MOPP level provides personnel the maximum protection from the chemical agent as it transitions from a contact and vapor hazard to a vapor hazard only.

- Follow-on Phase: In the follow-on phase, personnel will use gloves of any sort (i.e. leather, rubber, cloth, etc.) when operating on or handling the contaminated equipment. Although a contact hazard is unlikely, relatively small amounts of the agent may still be present. The use of gloves will ensure that unnecessary bare skin contact with agent residue is avoided.

Table A1.1 in the HQ AFCESA NBC Detection Guide shows times associated with initial and follow-on phases of the 10-foot rule. To simplify response processes, commanders may choose to use the worst-case scenario as the foundation for all 10-foot rule actions. For example, 24 hours for the initial phase and all periods of time greater than 24 hours for the follow-on phase.

12. Expeditionary and Contingency Operations

x. Given applicable references, describe facts about CBRN contamination control operations with at least an 80% accuracy. STS: 12.8.6.1., 12.8.6.2

CBRN CONTAMINATION CONTROL OPERATIONS

This objective will cover principles of contamination control and the relationship of detection capability to decontamination.

Principles

Contamination control is a combination of standard disease prevention measures and traditional CBRNE contamination avoidance and decontamination measures. This includes procedures for avoiding, reducing, removing, weathering, or neutralizing the hazards resulting from the contamination. Effective decontamination operations help sustain or enhance the flow of operations by preventing or minimizing performance degradation, casualties, or loss of material. Ineffective decontamination wastes manpower and material that is better spent on other, more productive missions.

Relationship of Detection Capability to Decontamination

Detection for surface contamination is the ability to detect deposited contamination on surfaces. The results are used to determine the need for immediate or operational decontamination and appropriate protective equipment. They may support the need to use alternate routes to avoid contaminated terrain if personnel cannot wait the short time period required for agent absorption. Results may also be used to adjust protective measures for people handling contaminated material.

12. Expeditionary and Contingency Operations

y. Given applicable references, describe facts about decontamination operations with at least an 80% accuracy. STS: 12.8.6.3.1., 12.8.6.3.2., 12.8.6.3.3.

DECONTAMINATION OPERATIONS

The following objective will cover levels and standards of decontamination, how to develop a decontamination plan and how to determine decontamination requirements.

Levels and Standards

The Air Force and Joint Services conduct decontamination operations at three levels: immediate, operational, and thorough. The table below lists the decontamination levels, purpose of each level, who does the task, what is decontaminated and when the operation will be conducted. Under some conditions, these operations can help sustain or enhance operations by allowing MOPP reductions, preventing contamination spread and reducing casualties and material contamination. However, there is no single procedure, machine, kit, or technique presently capable of fulfilling all airbase decontamination requirements. Present decontamination methods require that commanders and supervisors evaluate mission needs and the threat situation, identify a desired result from a successful decontamination operation, determine what resources and methods are available and decide on a course of action that can realistically reach the desired outcome. With the exception of personnel and medical patient decontamination, natural decontamination (use of decay, weathering and time) is the most cost-effective and easiest of the decontamination methods for airbase operations. Immediate and operational decontamination procedures for common individual and unit equipment are provided in the CBRNE Defense Course and within equipment technical orders. Under most wartime conditions, commanders should not attempt thorough decontamination operations for material, vehicles, munitions, equipment, aircraft, or terrain unless the anticipated result significantly reduces a mission-degrading hazard or allows a mission-critical MOPP reduction.

Level	Purpose	Who	What	When
Immediate	Minimize casualties, save lives, and help limit contamination exposure and spread	Individuals	Skin, personal clothing and equipment, frequently touched surfaces	As soon as contamination is suspected or detected
Operational	Limit contamination exposure and spread, helps to sustain operations by providing temporary and, in some cases, long-term relief from wearing IPE	Individuals, crews, teams, units	Parts of essential operational equipment, work areas, vehicles, and material	When operations require and resources permit
Thorough	Reduces or eliminates the need for wearing IPE	Units or wings, with or without external support	Personnel (CCA), equipment, material, vehicles, aircraft, work areas, terrain	When required for MOPP reduction; when operations, manning, and resources permit; required for total reconstitution and return to unrestricted use

Figure 12-64

Plan Development

When decontamination of mission essential equipment is necessary, efforts should be consistent with available resources and the contamination's effect on critical mission operations. Limit decontamination operations to those actions necessary to minimize contact hazards and to limit the spread of contamination to both personnel and equipment. There are limited numbers of equipment items in the inventory specifically identified for decontamination. The USAF has portable decontamination systems for use with equipment and personnel.
Individual decontamination kits are issued to all personnel for decontamination of the skin and personal equipment. There are, however, many common materials available for decontamination, to include items such as bleach, disinfectants, soap and water. Direction and priority of decontamination operations will be established by the SRC and passed to organization control centers tasked to conduct decon operations. SRC coordination of assigned assets is critical during expedient decon operations. Decontamination cannot restore all assets to usable condition. Some components are uniquely sensitive to CB agents or to decontaminants. The expertise of readiness, medical and bioenvironmental personnel can facilitate the restoration of assets to usable forms. However, some contaminated assets will require destruction

Contamination Control Teams (CCT's) are responsible for performing decontamination of critical assets usually at the operational or thorough levels. Team members must wear the suit properly and, because of the nature of the operation, go above and beyond in contamination avoidance. When performing decontamination operations with water, control the runoff and mark it as contaminated if appropriate. This will increase the risk of contact because members are working with or around higher or more concentrated contamination. To counteract this, members should wear rain gear over the GCE. This will provide additional protection from the agents and protect the GCE from water and/or fuel that might be used during the operation. CCT's will respond to taskings based on priorities established by the SRC and their unit control center. They

must check for, and assess the extent of, contamination then perform decontamination. When finished, the team must again retest for contamination if required. When there's no contamination detected, they should call the unit control center, report the status, and await further instructions.

Determine Requirements

Ensure all established tasks are accomplished for establishing decontamination areas for both on and off-base. Locate contamination control sites based upon mission requirements and available assets. Obtain specialized CB detection protection and decontamination equipment. Disperse sites from priority targets. Locate site off main route with easy access, in/out entry. Identify alternate entry and exit routes. For site set up consider, as a minimum: establishing a contaminated runoff containment area if appropriate, using sandbags and plastic for a contamination leaching area, filling bladder(s) and providing splinter protection and establishing a safe fuel storage site with fire extinguisher/s. Finally, notify unit control centers of the location and notify the SRC of completed activation.

Spot, or small area, decontamination may be required on equipment to be handled, on mission-essential equipment, and to keep liquid out of aircrew compartments. Deciding whether to decontaminate, how much to decontaminate and when and where to decontaminate, are tactical decisions that must be weighed in light of mission requirements.

The following is a typical equipment requirements list for each CCT: CAMs, M8 detector paper, M291 or 295 decontamination kits and wet weather gear. Other available assets that could be considered are: general purpose equipment such as fire-fighting equipment, mops, brooms, deicing equipment, water hoses,
support equipment such as cones, engineer tape, signs, NBC marking kit, sandbags, etc. Some critical decontamination operations include aircraft aircrew egress, refuel/rearm operations, vehicles and equipment.

13. Automated Systems

a. Given applicable references, describe facts about Joint Warning and Reporting System (JWARN) with at least an 80% accuracy. STS: 14.2.1.1., 14.2.1.2., 14.2.2.1., 14.2.2.2., 14.2.3.1., 14.2.3.2., 14.2.4.1., 14.2.4.2.

AUTOMATED SYSTEMS

The Department of Defense (DOD) and the Air Force are fully engaged in the information age with a concept of network-centric warfare that relies on the incorporation of state-of-the-art information technology (IT) in military automated systems. From major computer centers vital to managing the routine business of the department to frontline battlefield communications, automated, networked weapons systems and sophisticated joint Chemical, Biological, Radiological, Nuclear or CBRN warning and reporting systems, the demands for affordable, state-of-the-art IT products and services continue to increase. In the Readiness realm of emergency management and joint CBRN operations, the need for those integrated systems is critical to mitigating the issues of such an event and managing the training for those critical responders

JWARN Development

JWARN or The Joint Warning and Reporting Network provides the military services near real-time operational capabilities to collect, analyze and report CBRN agent detections, identification, location and warning information. JWARN can be interoperable and integrated with Joint/Service C4I systems and networks, supporting automated data exchange between the actual detector/sensor and the C4I system providing CBRN analyzed data. By using data provided, decisions for disseminating warnings down to the lowest level of the battlefield can be made. JWARN will provide additional data processing, reports and access to specific CBRN information, which will improve the efficiency of limited CBRN personnel assets. JWARN will enable commanders to understand both the tactical and strategic implications of an CBRN attack or hazard.

The JWARN program is using a three block evolutionary approach to system development with incremental changes occurring within each block

Block I

Block I, or the Interim Standardization Phase, consisted of Commercial Off The Shelf) Nuclear, Biological and Chemical or NBC warning and reporting software and Government Off The Shelf hazard prediction models which when released, immediately satisfied many of the operational requirements identified in the Joint Operational Requirements Document. The Block I release consists of seven versions of software developed for evaluation and feedback to the Program Manager for NBC Defense to improve the software to be fielded as part of Block

II and III efforts. JWARN Block I software was not planned to be integrated with C4I systems although the current 1E version has been modified to not only integrate with FBCB2, C2PC but also MCS. The USAF has opted to leave 1E as a standalone system. The distribution of JWARN software versions 1D has concluded and 1E is currently being fielded. JWARN Block I does not include any hardware.

Block II
The JWARN Block II effort will field improved software and introduce hardware interface devices. Multi-Integrated Chemical Agent Detector technology provided the functional baseline for JWARN Block II hardware interface requirements. Currently, the JWARN Block II program has experienced program challenges. The first solicitation for JWARN Block II Engineering and Manufacturing Development was cancelled at the direction of the USMC Milestone Decision Authority. On 21 March 01, the Request For Proposal was analyzed by the Marine Corps NBC and Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance groups. Upon completion of the USMC review, suggested changes were provided to the Services for evaluation. Anticipation of a new RFP will be developed using the JWARN Operational Requirements Document approved by USMC on 29 Jan 2001. Lockeed Martin has since received the contract and user assessments have been conducted in late 2005 and early 2006. Testing is on-going with a possible implementation date of late 07. This block two system incorporates a hardware and software integration.

Block III
The JWARN Block III effort will provide improved JWARN software and hardware. It is anticipated that appropriate materiel deficiencies identified by the Battle Management Integrated Concept Team will be included in a Change 2 update to JWARN Milestone III ORD.

The current Components of JWARN Block 1 include the following systems:

- NBC Analysis,
- VLSTRACK
- EMIS
- HPAC

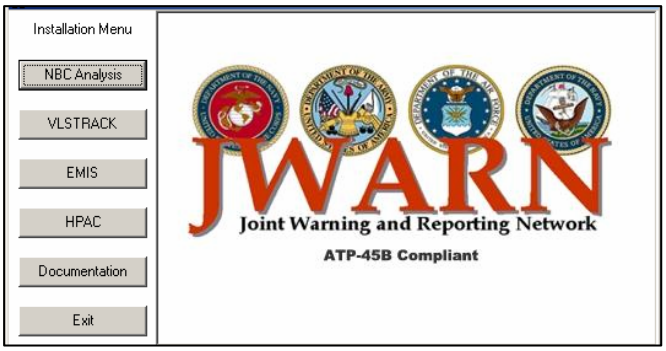

Figure 13-1

Figure 13-2

NBC Analysis

The greatest difficulty in the management of risks associated with that of biological, chemical and radiological attacks or releases, is the lack of time and information concerning the full extent of the contaminated area or areas. The advanced NBC-ANALYSIS Risk Management system combines sensors with computer technology and provides vital real-time information for decision makers. Fast, timely warning of both civilians and armed forces is essential to save lives and critical to mission continuation and force survivability.

The NBC Analysis system is a Commercial-off-the Shelf software package developed by BRUHN NewTech. The NBC Analysis hazard prediction warning and reporting procedures for NBC attacks are based on current North Atlantic Treaty Organization or NATO procedures in accordance with Allied Tactical Publication or ATP-45 bravo and AEP-45. In addition to NBC attacks, NBC Analysis can prepare predictions for approximately 1,000 Toxic Industrial Materials or TIMs in accordance with the 2004 North American Emergency Response Guide or NAERG. NBC Analysis can be used to prepare Battle Damage Assessment for nuclear attacks. The micro-meteorological data required to accurately determine the hazard area from a biological agent release is not currently available. The program has the ability to display troop positions and also provides data base management and can generate the standard ATP-45 message set and overlays. Eight NATO countries currently utilize the NBC Analysis program.

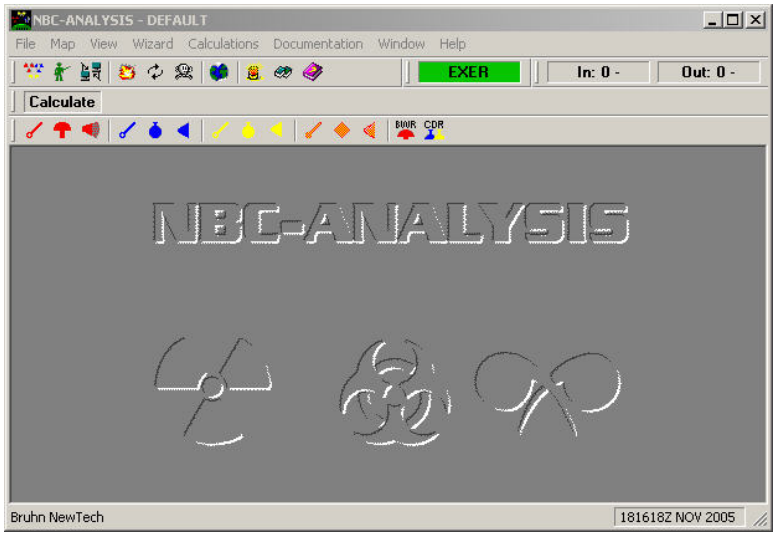

Figure 13-3

Need for NBC Analysis

The Current DOD and Air Force focus is on personnel safety, health and due diligence issues. For military personnel and emergency responders around the world, the threat to public health and safety is an important part of their job. The NBC-ANALYSIS Risk Management system provides enhanced security throughout the NBC spectrum. The software application is developed as a Nuclear, Biological and Chemical Risk Management information system enhancing coordination, decision-making and operational tasking – a capability that more than ever is required at all levels of command.

Figure 13-4

Figure 13-5

NBC Analysis Capabilities

The NBC-ANALYSIS program suite provides immediate, accurate information and associated hazard templates after events involving….The Terrorist use of Weapons of Mass Destruction or WMD, accidental or intentional releases of Nuclear, Biological, Chemical or Toxic Industrial Material and the offensive use of Weapons of Mass Destruction in a military manner.

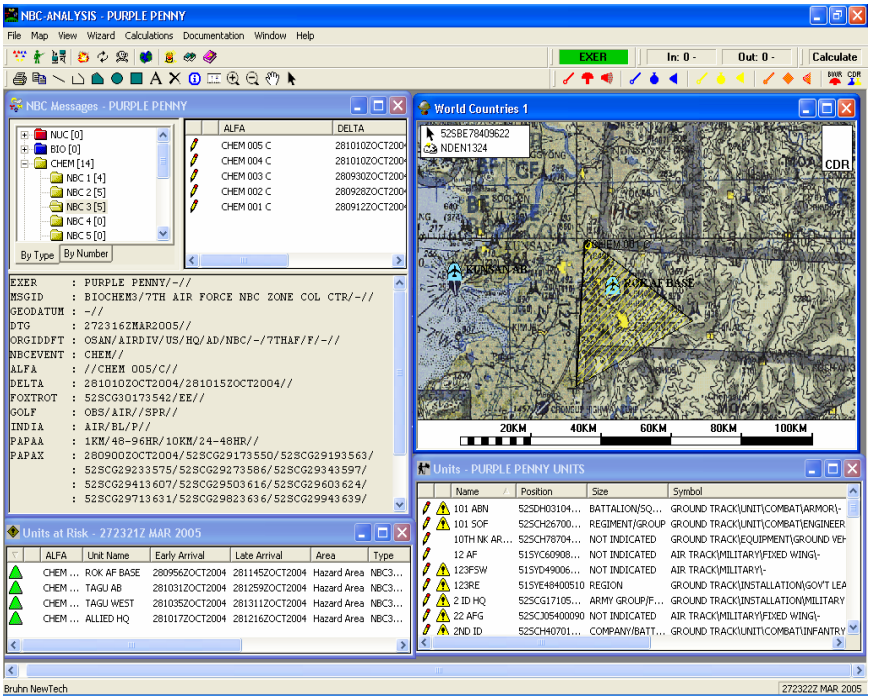

Figure 13-6

Components of NBC Analysis

The NBC-ANALYSIS software is available as a Commercial Off The Shelf product, which can be used by either military or civil emergency authorities to include Civil Defense or Fire Departments. In its stand-alone version it includes extensive mapping functions, message handling, a communications module and the capability of displaying unit positions and key installations.

Messaging

The NBC-ANALYSIS program is in messaging compliance with STANAG or Standard NATO Agreement or 2103, ATP-45 bravo and AEP-45. NBC messages are generated in accordance with the message formatting rules contained in the NATO publication. NBC-ANALYSIS is continuously updated to be in accordance with these rapidly changing standards with. Predictions and results can easily be

broadcast throughout all levels of command utilizing the majority of platforms including handheld devices. The Reports of an NBC attack or a release of Toxic industrial material including radiological material can be entered into NBC-ANALYSIS either manually or automatically, using data received from sensors

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Format: ORIGINAL **BWR** Page 1

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Figure 13- 7

Hazard Prediction

The software system automatically calculates the hazard area, utilizing meteorological information and instantly displays it on a map of the area of responsibility. The same data is used to identify units and key interest areas at risk or probable for risk. The NBC-ANALYSIS Risk Management software combines available information and calculates a schedule of events showing which units or key interest installations are in the hazard area, the expected time of hazard arrival and an estimate of when the hazard should have passed. This information will be critical for the different command levels during all aspects of the event.

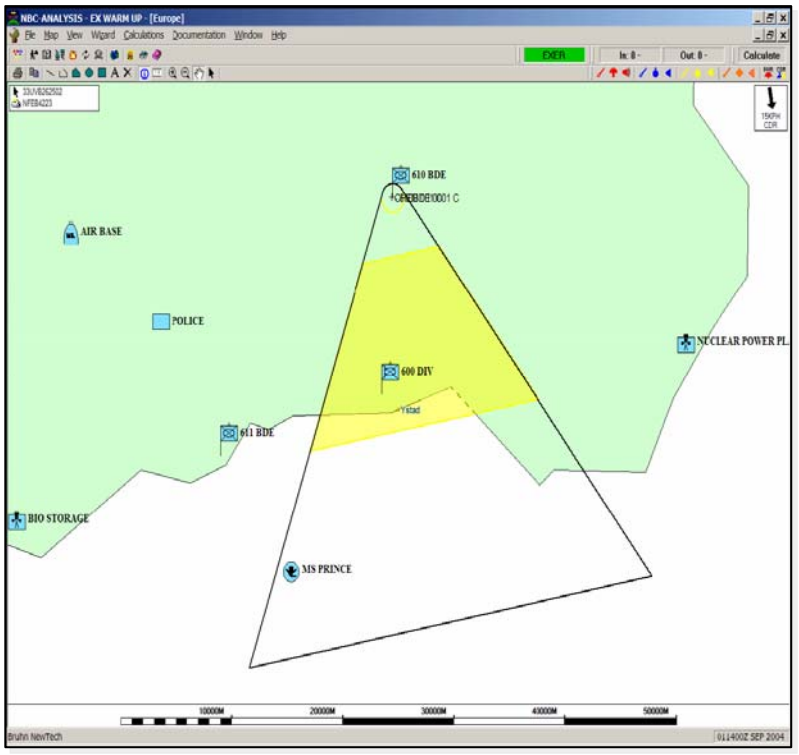


Figure 13-8

Mapping

The NBC-ANALYSIS program supports the following geographical coordinate systems: Universal Transverse Mercator or UTM, Military Grid Reference System or MGRS, The British/Irish National Grid and Latitude and Longitude which translates to degrees, minutes and seconds. The NBC-ANALYSIS map module can display vector maps, raster maps, aerial photographs, and satellite photos. Maps can be imported using the relevant NATO or US mapping standards.

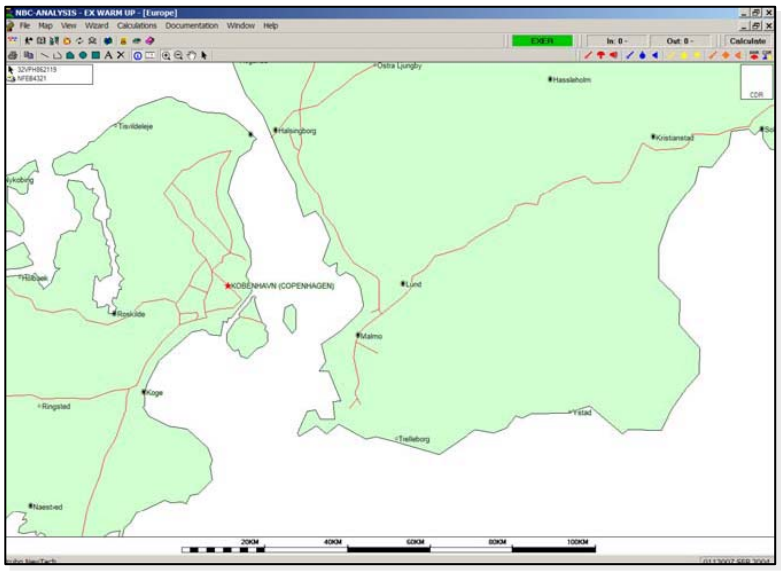
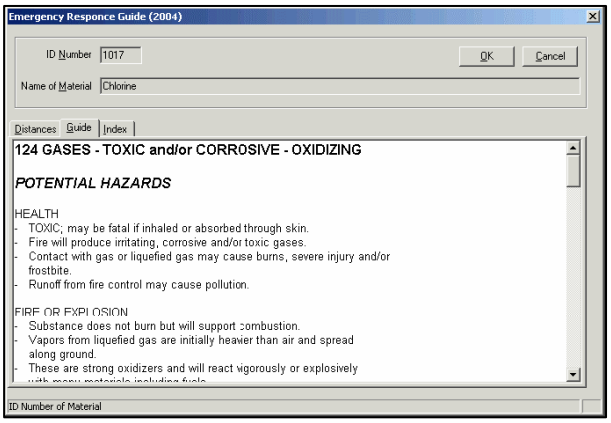


Figure 13-9

Internal Information

Currently the need for reference data readily available is crucial to possible NBC events. NBC Analysis has incorporated some of this critical material for Casualty handling and guidance on the correct protective gear to use, provided via the integrated 2004 North American Emergency Response Guide or NAERG, built into the system. This guide contains more than 3.500 different types of industrial chemicals and radiological materials. Also included is FM 8-9 which covers the medical aspects of NBC defensive operations to include nuclear, biological and chemical casualties.



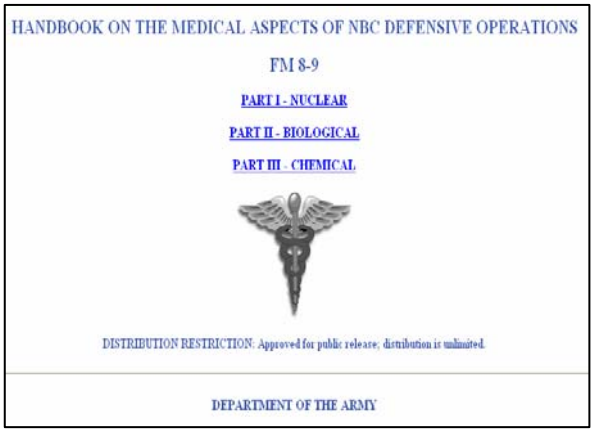


Figure 13-10

Figure 13-11

Vapor Liquid and Solid Tracking (VLSTRACK)

Another system under JWARN is the Chemical/Biological Agent Vapor, Liquid, and Solid Tracking or VLSTRACK which was developed primarily as a tactical decision aid for predicting hazards resulting from an attack with CB agents in a military environment. It provides a chemical and biological hazard assessment plume model program that simulates the release and downwind hazard from a chemical or biological warfare attack

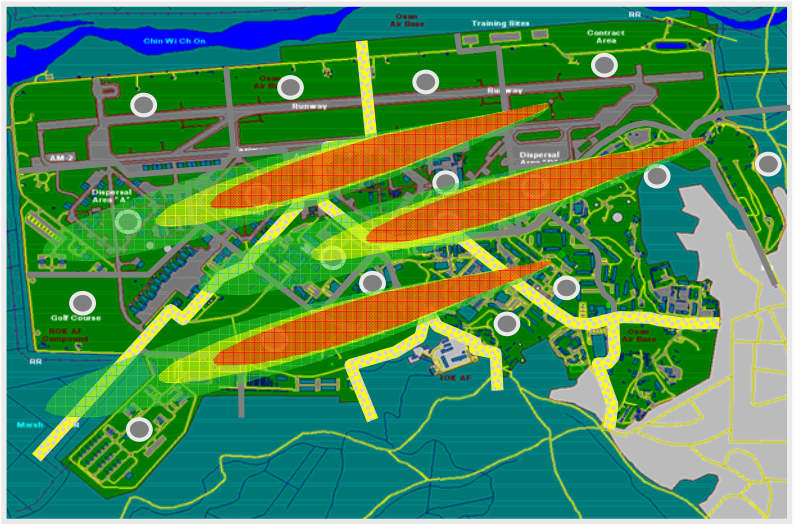


Figure 13-12

Need for VLSTRACK

To fill an urgent requirement from Operation Desert Shield, Desert Storm, The U.S. Navy was tasked to develop a detailed plume modeling program which eventually evolved into the “Chemical/Biological Agent Vapor, Liquid, and Solid Tracking or VLSTRACK Computer system. The system provides approximate downwind hazard predictions for many currently known or suspected chemical and biological agents and a wide variety of munitions capable of disseminating chemical or biological agents. The range of capabilities included allows the model to be used for operational hazard assessment or for research and development studies, with operation being "user-friendly." The model is also suitable for training applications.

VLSTRACK Capabilities

The VLSTRACK system can predict plume hazards using a transport and dispersion model that provides approximate downwind hazard predictions for a wide range of chemical and biological agents and munitions of military interest. VLSTRACK features smart input windows that checks input parameter combinations to ensure that a reasonable attack is being defined and simple and informative output graphics that

display the hazard footprint for agent deposition, dosage, or concentration. The Output scan be obtained either as a cumulative hazard from the time of the attack or as a periodic hazard for each time period. The model also features variable meteorology, allowing for interfacing the attack with a meteorological forecast; this feature is very important for biological and secondary evaporation computations. A vertical wind profile forecast can also be used for high-altitude releases. For the need for quick estimates, the model features a rapid approximation option for each of the attack situations that can be used for preliminary hazard evaluation. The rigorous calculations can be performed if a more accurate hazard estimate is required and time permits. The rigorous calculations may require an hour or more to model biological plumes, large numbers of munitions, and secondary evaporation.

Components of VLSTRACK

Munitions Property Window

Some of the many components of the VLSTRACK software include the Munitions Property Window which is used to further define the munitions selected in the Main Attack Window.

Attack Meteorology Window

The Attack/Meteorology window features variable meteorology allowing for the attack to be interfaced with a meteorological forecast.

One special note is that several chemical and biological agent and munitions names and or parameters are classified as SECRET. Two versions of each data file are available, one classified as SECRET, the other UNCLASSIFIED. The UNCLASSIFIED files use "dummy files" or approximate names and or values in place of SECRET entries; the UNCLASSIFIED values are intended to be considerably different from their SECRET counterparts.

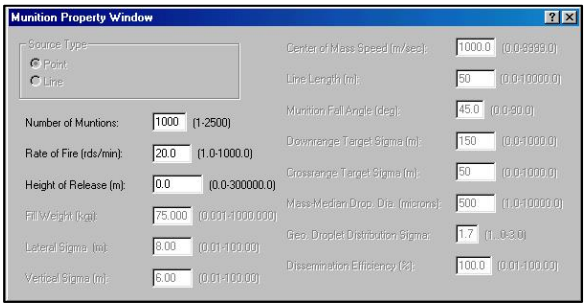


Figure 13-13

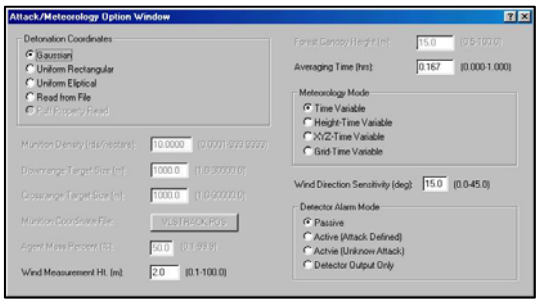


Figure 13-14

Output/Computational Option Window

Another component, The Output or Computational Option Window defines the computations used and the display of output to include: grid point mode, grid sizing mode, incident location, deposition and or dosage and hazard levels,

Dosage and or Output Height, Output Frequency, Plot Pause Mode, Gaussain plume mode, Sprayer Duration, Random Number Seed, Sub-munitions Seed, Wind meander speed, Output Time File.

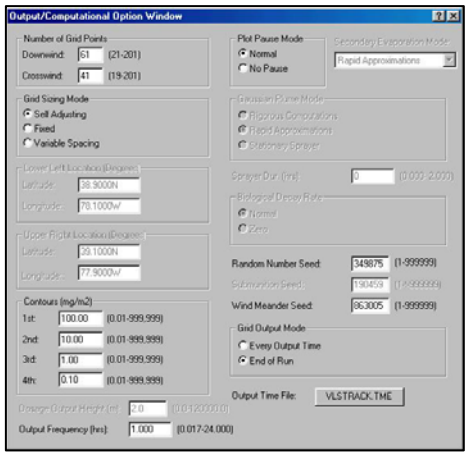


Figure 13-15

Detector Window

The Detectors in VLSTRACK are assigned reference points that record chemical and or biological agents either in deposition, dosage, or concentration levels. The inputs and outputs are included in the detector location, detector number, sampling height, detector status, alarm time for military, detector file, detector flow rate, detector duration, detector threshold, clear detectors and new detector.

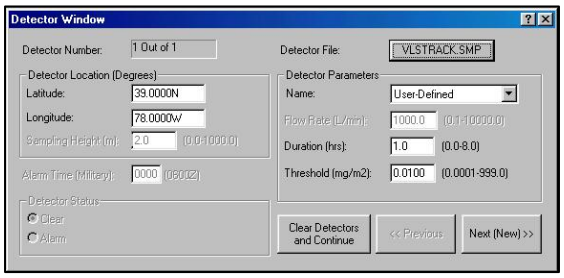


Figure 13-16

VLSUTILITY Program

The purpose of Vapor Liquid, and Solid Utility known as VLSUTIL is to process the output files of VLSTRACK and provide an easy way to create some input files. VLSUTIL component was developed in order to create a use-friendly graphical interface and to expand the current program parameters.

A special note is that this feature allows the user to plot an existing grid file or plot without running the entire VLSTRACK program.

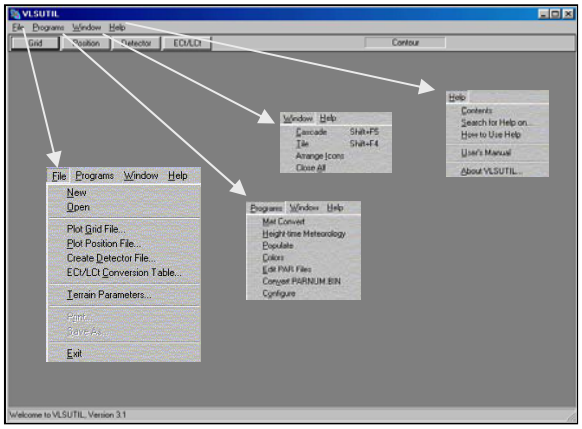


Figure 13-17

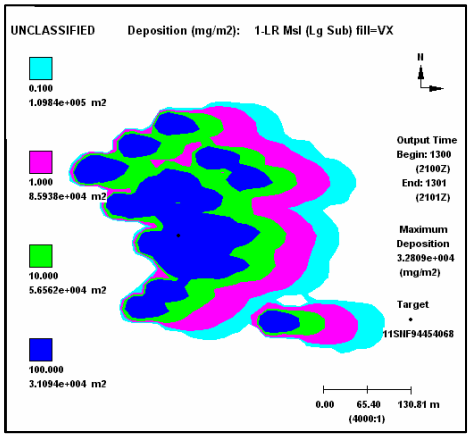


Figure 13-18

Emergency Management Information System (EMIS)

The Emergency Management Information System or "EMIS" was developed for the Chemical Stockpile Emergency Preparedness Program by Applied Computing Systems Inc of Los Alamos, New Mexico, to support the eight chemical weapons stockpile sites in their emergency management and demilitarization tasks. There are two EMIS systems in use. EMIS networked and EMIS detached. The USAF uses the later, EMIS detached.

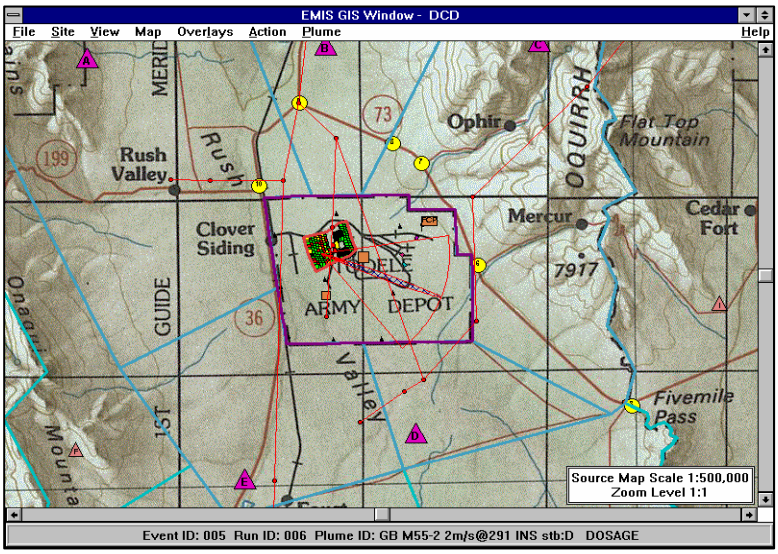


Figure 13-19

Need for EMIS

The EMIS detached system supports rapid hazard prediction if there is an accidental release of hazardous chemicals from the 8 stockpile sites. It can also be used for planning, training exercises, and for information management if needed.

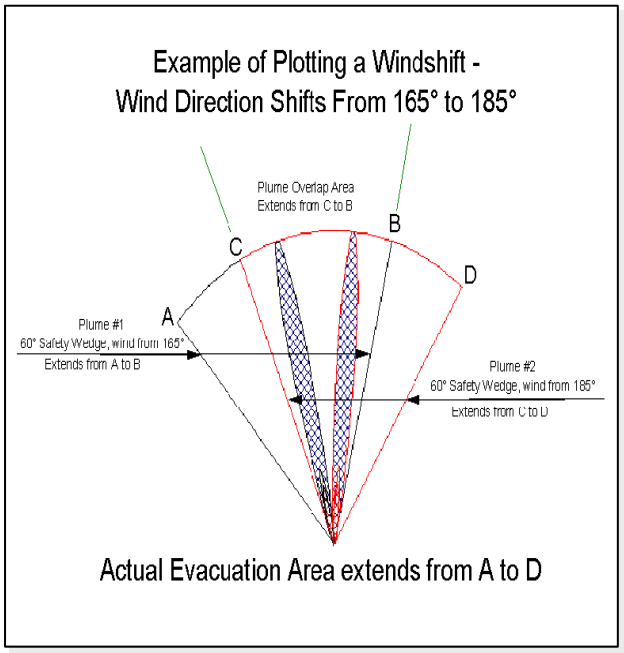


Figure 13-20

EMIS Capabilities

The EMIS detached system addresses the preliminary hazard prediction and protective action parts of emergency management. The program is intended to allow the user to log in to the system, predict a downwind chemical hazard given a worst-case release scenario and the current weather, automatically find base boundary and zone crossings, view the hazard plume on a map, determine if whether population centers are affected, record additional details about the hazard, and send and receive messages by electronic mail. There are also three logs files for recording and retrieving information. The three are, the Status Board, the Work Plan and the Free Form Log. With EMIS, installed as Detached EMIS, you can run the hazard prediction model, Geographical Information System or GIS, Status Boards and Auto D2PCw on stand-alone PCs, including laptop and notebook computers.

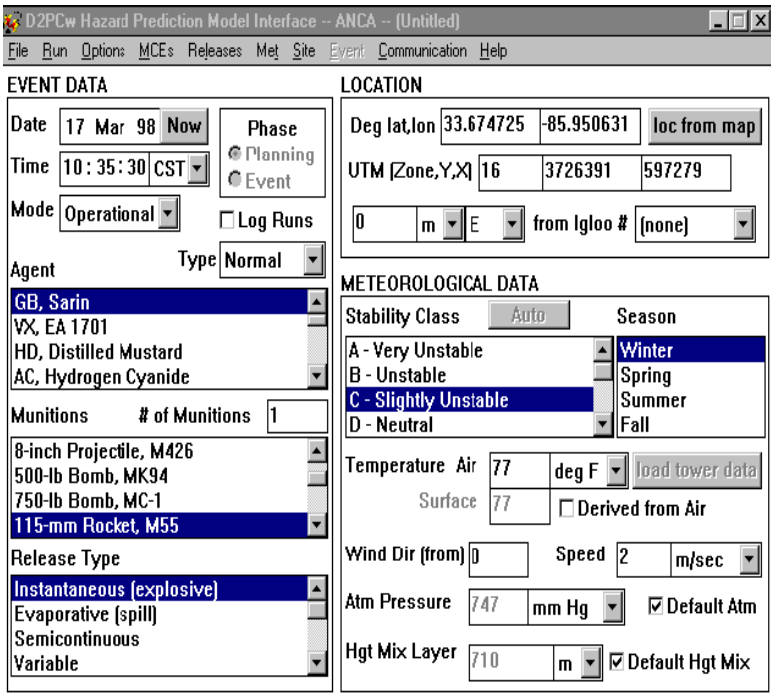


Figure 13-21

Components of EMIS

The EMIS system normally runs on a network of personal computers, each running Microsoft Windows NT and sharing files through a network file server using one or more Sun computers or personal computers as file servers. EMIS can be run in a remote mode from laptop and notebook computers that are connected through a dial-up or dedicated communications line.

Status Boards

The Status Board component can be considered a replacement for the many acetate and grease pencil boards found in Emergency Operations Centers. They can be used to record details about the accident for current viewing to general or selected audiences. Projected onto a screen or large monitor they can be made easily available to everyone. All entries made in the Status Board module are recorded for later reference. Status Boards are dynamic, that is, they all change as entries are made. Status Board entries are updated automatically about every ten seconds. They are user configured and can be tailored to grant access on a selective basis when needed.

D2PCWw

The D2PCw component, a windows interface to the D2PC system, is the application in EMIS that does the downwind hazard predictions. D2PC is the Army-approved chemical hazard prediction Model for the Chemical Stockpile Emergency Preparedness Program use GRABBIT.

GRABBIT
GRABBIT is the EMIS way of allowing you to "take a picture" of the screen or a selected area of it and utilize it. When using this function you do not have to be logged on to EMIS to use GRABBIT.

Event Clock
Another component, the EVENT CLOCK is an EMIS program which can be used to display time which is utilized in the program.

Hazard Prediction and Assessment Capability (HPAC)

Another component of the JWARN software suite is HAPC. HPAC or The Hazard Prediction and Assessment Capability is an automated software system which provides the means to accurately predict the effects of hazardous material released into the atmosphere and its impact on civilian and military populations. Utilizing integrated source terms, high-resolution weather forecasts and atmospheric transport and dispersion analyses to model hazard areas produced by military and or terrorist incidents and industrial accidents.

Figure 13-22

Need for HPAC

Operation Desert Storm illustrated the need for an automated hazard prediction tool used in an operation climate. During that campaign, predictions of the collateral effects of potential weapons-of-mass-destruction use were inefficient and untimely. Predictions were conducted by sending requests for analysis from the theater of operations to the Defense Nuclear Agency, a predecessor organization to the Defense Threat Reduction Agency or DTRA, for technical analysis. Analytical products were then sent back to the theatre. This experience prompted the effort to make hazard prediction and collateral effects tools available to the theatre of operations and local commanders. DTRA's background of more than 50 years of researching blast effects and analysis provided a strong platform to accomplish this mission

HPAC Capabilities

The Hazard Prediction and Assessment Capability system is a forward-deployable, counter-proliferation-counterforce collateral-effects assessment tool available by license for government, government-related or academic use. It can provide the means to accurately predict the effects of hazardous material releases into the atmosphere and its impact on civilian and military populations. It ahs the capability to model nuclear, biological, chemical, radiological and high explosive collateral effects resulting from conventional weapon strikes against enemy weapons of mass destruction production and storage facilities. The HPAC system also predicts downwind hazard areas resulting from a nuclear weapon strike or reactor accident and has the capability to model nuclear, chemical and biological weapon strikes or accidental releases.

Components of HPAC

Incident models that can calculate the characteristics of the released NBC material. Routines and databases that provide environmental data including weather and terrain: Atmospheric transport model that calculates how the released material disperses through the environment; Human effects models to help quantify the impact on personnel and operations; as well as the user interface called the Project Editor, that controls the interactions between the other components.

Graphic User Interface/ Atmospheric Transport Model

Additional components like the Graphical User Interface are also important. The HPAC GUI, which is called the Project Editor, provides interactive editing and viewing of HPAC projects. This Graphical User Interface incorporates a mapping tool called Open-Map, which allows you to plot input and output on a map background. The HPAC system also includes an atmospheric transport model called the Second-order Closure Integrated Puff model. Second-order Closure Integrated Puff model calculates how the released material disperses through the

environment. Second-order Closure Integrated Puff model calculations take into account turbulence and diffusion due to a variety of factors including the weather and terrain.

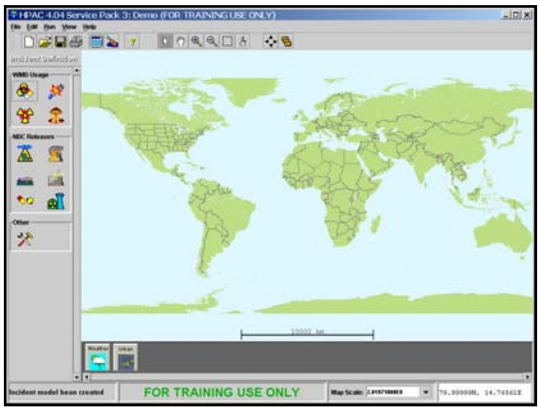


Figure 13-23

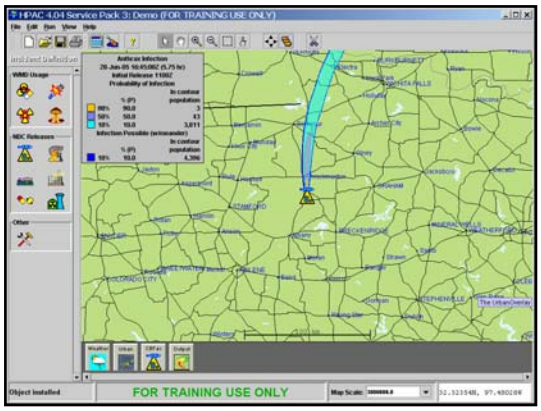


Figure 13-24

Incident Models

The HPAC system lets you describe an incident in terms of Where, What, and When. One of the HPAC systems integrated incident models then calculates the associated NBC release based on your inputs. HPAC includes the listed incident models also called source term models:

Environmental Data

When conducting any type of hazard prediction one of the most critical pieces of the puzzle is the environmental data. HPAC includes an integrated database of historical weather, terrain elevation, land cover, and map data. This data provides a standalone capability to run HPAC. Furthermore, HPAC integrated environmental data readers let HPAC use weather data files that are downloaded from a Meteorological Data Server or other external data sources. This external data may be more applicable in time and space, thus producing more accurate output to the user.

When terrain elevation data is used HPAC automatically invokes a mass-consistent wind field model. The default mass-consistent wind model is called the Stationary Wind Fit and Turbulence model.

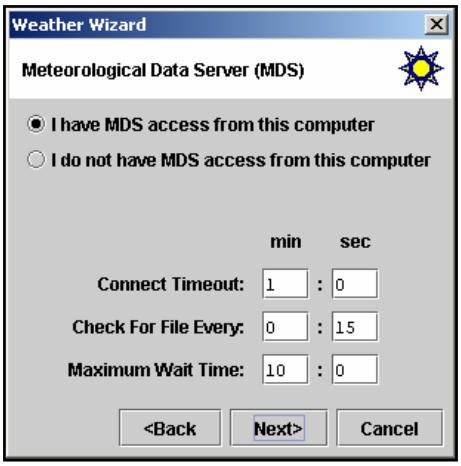


Figure 13-25

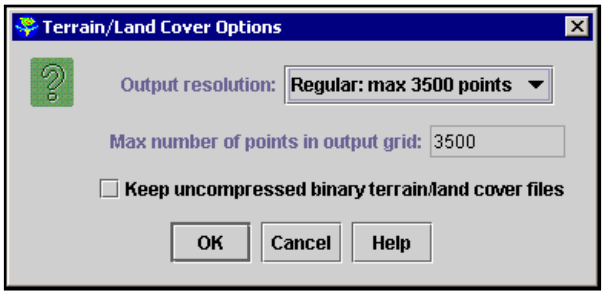


Figure 13-26

Weather

In addition to being a big piece of the puzzle, relevant real-world hazard prediction requires timely and accurate weather data in the area of concern is also critical. The HPAC system allows the user easy access to forecast weather and real-time weather observation data by using a variety of DTRA supported Meteorological Data Server systems. The HPAC system also has embedded climatology or historical weather data for use when planning incidents beyond the normal time associated with credible weather forecast data. One-kilometer terrain data and supporting wind-flow models calculate the local winds field in the area of concern. Other weather sources are also available upon request to DTRA utilizing special permissions.

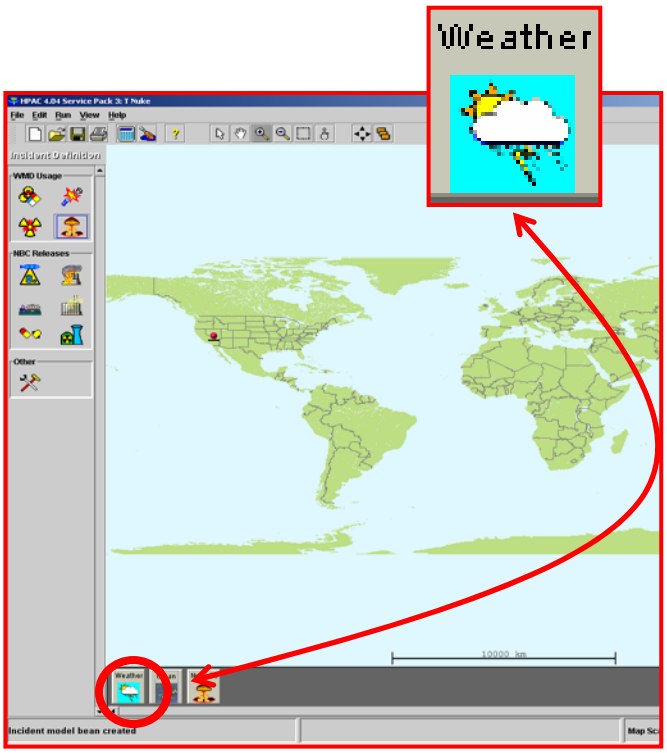

Weather
HPAC 4.04 Service Pack 3: T Nuke
File Edit Run View Help
Incident Definition
WMD Usage
NBC Releases
Other
10000 km
Weather
Incident model bean created

Figure 13-27